Abstracts

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ANALYSIS OF STRUCTURAL AND QUALITATIVE CHARACTERISTICS OF THE CERVICAL VERTEBRAE IN THE INDIVIDUALS OF BOTH SEXES

Olena ADAMOVYCH[1], Yuriy KRYVKO[1], Zoryana MASNA[2], Solomiya CHAJKOVSKA[2], Khrystyna RYZHUK[2], Yulian KUHLEVSKYJ[2], Maxym KOTSARENKO[2]

[1]Danylo Halytsky Lviv National Medical University, Normal Anatomy Dept, [2]Danylo Halytsky Lviv Nat.Medical University, Operative Surgery and Topographic Anatomy Dept, Ukraine

The cause of diseases associated with impaired blood supply to the brain often is abnormal changes in the cervical spine. The aim of our work was to analyze linear dimensions and bone density of the cervical vertebrae in adolescence. The analysis of linear dimensions and bone density of 21 boys and 18 girls was carried out using a computer tomograph of the fourth generation TSX-101A Aquilion 16.Linear dimensions (height, width, depth) and bone density of the anterior arch of the atlas and various parts of the body of each cervical vertebra in direct and lateral projections were measured using standard computer software K-Pacs-Lite. The results showed that the body… of the second cervical vertebra has the greatest height on the anterior edge, the lowest - on the posterior edge. The biggest height was on the posterior edge, and the lowest - in the middle in the fourth, fifth and sixth cervical vertebrae. The most wide body of the cervical vertebrae was in the middle, the lowest - on the inferior edge in boys and in girls... Analysis of the bone density showed that the highest index was on the superior edge of the body in the second, third, fourth and seventh vertebrae, in the sixth vertebra – on the inferior edge, in the fifth vertebra–on the superior edge in girls and on the inferior edge in boys. Bone density was the lowest in the central area of the vertebral bodies in all examined individuals.

ANTHROPOMETRIC CORRELATIONS BETWEEN PARTS OF THE UPPER AND LOWER LIMB: MODELS FOR PERSONAL IDENTIFICATION IN A SUDANESE POPULATION

Altayeb A. AHMED

King Saud bin Abdulaziz University for Health Sciences, Basic Medical Sciences, College of Medicine, Saudi Arabia

Identification of a deceased individual is an essential component of medicolegal practice. However, personal identification based on commingled limbs or parts of limbs, necessary in investigations of mass disasters or some crimes, is a difficult task. Limb measurements have been utilized in the development of biological parameters for personal identification, but the possibility to estimate the dimensions of parts of limbs other than hands and feet has not been assessed. The present study proposes an approach to estimate the dimensions of various parts of limbs based on other limb measurements. The study included 320 Sudanese adults, with equal representation of men and women. Nine limb dimensions were measured (five based on the upper limb, four based on the lower limb), and extensive statistical analysis of the distribution of values was performed. The results showed that all dimensions are sexually dimorphic and that there is a significant positive correlation between the dimensions of various parts of limbs. Regression models (direct and stepwise) were developed to estimate the dimensions of parts of limbs based on measurements pertaining to one or more other parts of limbs. The study revealed that the dimensions of parts of the upper and lower limb can be estimated from one another. These findings can be used in medicolegal practice and extended to constructive surgery, orthopedics, and prosthesis design for lost limbs.

MORPHOMETRIC ANALYSIS OF STERNAL SEXUAL DIMORPHISM IN A CONTEMPORARY SAUDI POPULATION

Altayeb A. AHMED[1], Faris O. ALSHAMMARI[1], Abdulaziz S. ALRAFIAAH[1], Ali A. ALMOHAISANI[1], Omar A. AL-MOHERJ[1], Fahad O. ALKUBAIDAN [2]

[1]King Saud bin Abdulaziz Univ. for Health Sciences, Basic Med. Sciences, College of Medicine, [2]King Abdulaziz Med. City, Dept of Medical Imaging, Saudi Arabia

Sex estimation is an essential step for identifying unknown individuals and usually depends on the existence of highly dimorphic bones, such as the pelvis and skull. Nevertheless, the body integrity can be compromised in certain circumstances, and these bones might be absent; therefore, the ability to utilize other bones for sex estimation is crucial. The aims of this study were to collect baseline data for sternal dimensions in Saudi adults, assess the existence of sexual dimorphism in the sternum, and generate population-specific equations to estimate sex using sternal dimensions. During 2014–2015, 200 thoracic/thoraco-abdominal computed tomography (CT) images (100 men, 100 women) were anonymously collected from King Abdulaziz Medical City. Six measurements and two indices were calculated after 3D reconstruction of the CT scans. Descriptive statistics were calculated and sexual dimorphism was assessed using independent t-tests. Discriminant function equations were developed for these measurements. Except for the sternal index, men had significantly larger dimensions than women. Sexual dimorphism was highly significant ($p < 0.001$). The best single

predictor was the combination of the manubrium and sternal body lengths (89.5%). In the stepwise analysis, the best predictors were the manubrium length, sternal body lengths, manubrium width, and corpus sternal width at the first sternebra, with cross-validated accuracy of 90.5%. Cross-validated accuracy for all measurements ranged between 62.5% and 90.5%. This study is novel in its assessment of sexual dimorphism among Saudis utilizing sternal CT modalities. The findings of the study have important anatomical, anthropological, and forensic applications.

TOPOLOGICAL VARIABILITY AND SEX DIFFERENCES IN FINGERPRINT RIDGE DENSITY IN A SAMPLE OF THE SUDANESE POPULATION

Altayeb A. AHMED[1], Samah OSMAN[2]
[1]King Saud bin Abdulaziz Univ. for Health Sciences, Basic Med. Sciences, College of Medicine, Saudi Arabia, *[2]Univ. of Khartoum, Anatomy Department, Faculty of Medicine, Sudan*

Fingerprints are important biometric variables that show manifold utilities in human biology, human morphology, anthropology, and genetics. Their role in forensics as a legally admissible tool of identification is well recognized and is based on their stability following full development, individualistic characteristics, easy classification of their patterns, and uniqueness. Nevertheless, fingerprint ridge density and its variability have not been previously studied in the Sudanese population. Hence, this study was conducted to analyze the topological variability in epidermal ridge density and to assess the possibility of its application in determining sex of Sudanese Arabs. The data used for this study were prints of all 10 fingers of 200 Sudanese Arab individuals (100 men and 100 women) aged between 18 and 28 years. Fingerprint ridge density was assessed for three different areas (radial, ulnar and proximal) for all 10 fingers of each subject. Significant variability was found between the areas ($p < 0.01$). Women showed significantly higher ridge density in the three areas for all and each fingers. Men and women showed similar patterns of densities with distal areas being denser than proximal ones. Side asymmetry was more evident in distal areas. Ridge density thresholds for discrimination of sexes were developed. Hence, fingerprints found in forensic examinations/crime scenes can be useful to determine sex of Sudanese individuals based on fingerprint ridge density, furthermore, ridge density can be considered a morphological trait for individual variation in forensic anthropology

ASSESSMENT OF THE VOLUME OF THE SCAPHOID BONE ON MAGNETIC RESONANCE IMAGES USING THE STEREOLOGICAL TECHNIQUES

Gürsel AK GÜVEN[1], Amani ELFAKI[2], Alaa IBRAHIM[2], Güdek M. AÇAR[2], Bunyamin SAHIN[2]
[1]Ondokuz Mayis University, Samsun, [2]Dept of Anatomy, Faculty of Medicine, Ondokuz Mayis University, Turkey

The scaphoid is the most commonly fractured carpal bone, accounting for 71.2% of all carpal fractures. It often occurs after hyperextension of the wrist or in an accident. The incidence of scaphoid non-unions has been reported to be between 5-15%. The aim of this study is to evaluate the magnetic resonance (MR) images of the right-left scaphoid bone among healthy subjects. The study included 12 (27-75 years old) healthy females. Ten right (RT) and 12 left (LF) wrists were examined. Participants were scanned using Siemens 1.5T MR (3D_WATSc MR images of the wrists). DICOM images were transferred to the ImageJ software. Volumes of the scaphoid bone were obtained using the manual planimetry technique. The mean (±Standard Deviation) volume for the right scaphoid was 766.59 ± 172.53 mm3, the left scaphoid was 753.90 ± 176.12 mm3 and the total mean volume of scaphoid was 759.65 ± 176.12 mm3. There were no significant different between the right and left volume of scaphoid ($P > 0.05$). Regarding the age there were no statistical correlation with the right and left volume of the scaphoid ($P>0.05$). We will evaluate the intra- and inter-observer variance in the coming days. The volume of the scaphoid is not different between right and left, this fact must be taken into account if the contralateral scaphoid should be used in surgical planning. Volumetric analysis of the scaphoid is recommended for appropriate treatment of scaphoid non-union. Methodologically, the volume of the scaphoid bone could be estimated on MR images.

PIRIFORMIS SYNDROME

Waseem AL TALALWAH[1], Shorok AL DORAZI[2], Zainab AL HASHIMI[3], Hassan AL MOUSA4, Roger SOAMES5
[1]King Saud bin Abdulaziz Univ. for Health Sc., Basic Medical Sciences, College of Medicine, Saudi Arabia, *[2]Directorate of Prevention and Control of Healthcare Assoc. Infection, Eastern Province, MOH, Saudi Arabia*, *[3]Saihat 2 Primary Health Center, Ministry of Health, Saudi Arabia*, *[4]Qatif Central Hosp., Internal Medicine Dept, Saudi Arabia*, *[5]Univ. of Dundee, Centre for Anatomy and Human Identification, College of Art, Science and Engineering, UK*

Piriformis …entirely enveloped by thin fascia, plays a vital role in providing stability to pelvic viscera with a role in abduction and lateral rotation... It leaves the pelvic via the greater sciatic foramen splitting it into supra- and infrapiriform canals. The suprapiriform canal conveys the superior gluteal vein, artery and nerve, while the infrapiriform canal conveys the inferior gluteal and internal pudendal neurovascular bundles, the sciatic and posterior femoral cutaneous nerves and the nerves to the obturator internus and quadratus femoris… The sciatic nerve usually passes below the piriformis and then divides into tibial and fibular… Current study investigates 100 specimens to describe the pirifomis morphology and the sciatic nerve courses. 98% of the pirifomis found to be single whereas in 2% found to be double. In double piriformis case, the common peroneal nerve passes between the piriformis. Theoretically, the sciatic nerve classified into several forms based on its course and branches. The Complete (undivided) sciatic nerve passes below piriformis found to be in 90% whereas its congenital absence found to be 8% as its branches appears below the piriformis. The common peroneal nerve is highly susceptible to compression by the piriformis more than tibial or sciatic nerve. The double piriformis carrying highly risk of common peroneal nerve risk than the solitary one. Consequently, asciatica can be classified clinically as peroneal asciatica syndrome. Neurologists, neurosurgeons and orthopedics have to be aware in workup diagnosis to precede the final diagnosis and to minimize the postsurgical complication.

EXPRESSION OF THE O-LINKED N-ACETYLGLUCOSAMINE CONTAINING EPITOPE H (O-GLCNACH) IN HUMAN UTERINE CERVICAL MUCOSA

Fotis ARAPIS[1,2], Leonidas ARVANITIS[3], Aris H ZIBIS[2], Sophia HAVAKI[4], Sotirios SOTIRIOU[5], Dimitrios ARVANITIS[2]
[1]General Hosp. of Sparta, Dept of Obstretics - Gynecology, Greece, *[2]Medical School Univ. of Thessaly Larissa Greece, Dept of Anatomy, Greece*, *[3]Rush Univ. Medical Center, Dept of Pathology, United States*, *[4]Medical School, Univ. of Athens, Dept of Histology-Embryology, Greece*, *[5]Medical School of Larissa, Univ. of Thessaly, Embryology, Greece*

Epitope H contains an O-linked N- Acetylglucosamine residue in a specific conformation and / or environment recognized by the mouse monoclonal antibody H (mabH)… It plays a role in involved in cell processes such as transcription, translation, protein compartmentalization, proteasomal degradation, competition with phosphorylation, which influence cell division, differentiation, development, apoptosis, resistance to stress and are engaged in major diseases such as cancer, diabetes mellitus, cardiovascular and neurodegenerative diseases. In the present work, we examined the expression of (O-GlcNAcH) in the cells of 60 cases of endocervical mucosa curettings, including 15 small polyps. In all cases examined, the expression of the cytoplasmic staining for the (O-GlcNAcH) was as follows: 1) Mucin secreting cells (MSC) of endocervical mucosa very low. 2) MSC of endocervical polyps

low. 3) Non-mucin secreting secretory cells high expression. 4) Ciliated cells high expression. 5) Normal and hyperplastic reserve cells high expression. 6) Cells of immature squamous metaplasia high expression. 7) Cells of mature non-keratinizing squamous epithelium as follows: Basal cells very low expression, parabasal cells negative expresion, intermediate and superficial cells high expression. 8) Endothelial cells high expresion. 9) Fibroblasts/fibrocytes of cervical mucosa negative expresion. 10) Stromal cells of endocervical polyps high expresion. The (O-GlcNAcH) is expressed in a different pattern in the cells of the human uterine cervical mucosa and further characterization of the polypeptides, which bear the epitope H might shed more light into the role of the (O-GlcNAcH) in the biology of these cells.

VARIATIONS OF NEUROVASCULAR STRUCTURES OF THE UPPER LIMB

Juraj ARBANAS, Luka ĐUDARIĆ, Snježana BAJEK, Marina NIKOLIĆ, Dragica BOBINAC
Department of Anatomy, Faculty of Medicine, University of Rijeka, Croatia

Anatomical variations of neurovascular structures of the upper limb are not uncommon. Ulnar and radial arteries terminate in palm usually forming complete superficial palmar arch. Musculocutaneous nerve arises from the lateral chord of brachial plexus and passes through coracobrachialis… Rarely, it adheres for some distance to the median nerve and passes behind biceps. Median nerve arises with two roots from the lateral and medial chord of brachial plexus, enters the arm lateral to the brachial artery and crosses in front of the artery descending to cubital fossa medial to the artery… We found formation ofan incomplete superficial palmar arch where the radial superficial branch didn't anastomose with ulnar artery but gave one common palmar digital artery (dividing into two proper palmar digital arteries supplying the index and middle finger) and one proper palmar digital artery for lateral side of index finger. Ulnar artery gave remaining two common palmar digital arteries. The palmar digital artery for the medial side of the little finger arose from third common palmar digital artery. Musculocutaneous nerve adhered median nerve and didn't pass through coracobrachialis. Median nerve after entering the arm lateral to the brachial artery crossed artery from behind. Although, anatomical variations of vessels and nerves of the upper limb are quite common, multiple neurovascular variations in the single upper limb are, probably, less frequent. However, as seen from our case, they do coexist and that should be taken into consideration during various diagnostic, surgical or other medical procedures.

THE VARIATIONS OF CELIAC ARTERY AND THE FREQUENCY OF THE ENTITY

Harun ARSLAN, Abdussamet,BATUR Alpaslan YAVUZ, Muhammed ALPALAN, Ilyas DUNDAR, Mesut OZGOKCE
Yuzuncu Yil University, Radiology, Turkey

Purpose: Investigation of the study was to clarify the celiac artery abnormalities and their incidence by the routine abdominal CT examination. Materials and Methods: In this study, 1346 patients between the age range of 15 and 79 years were enrolled. Patients had abdominopelvic computed tomography (CT) examinations due to various indications and intra-venous contrast medium injection was performed in all. A retrospective review of the CTs was done in terms of determining the celiac artery variations/anomalies. Results: In 35 of the 1346 patients (%2.60) included in this study had a various type of celiac artery variations/anomalies. In this 35 patients; 14 of them (% 1.04) had a common originated superior mesenteric artery and celiac artery, 17 of them (%1.29) had separated splenic artery and hepatic artery with different origins while 4 of the patients (% 0.29) had the hepatic artery originate from superior mesenteric artery independently. Conclusion: The accurate definition of the celiac artery morphology including it's variations/anomalies had a significance especially a head of the related surgical or interventional procedures regarding liver, spleen or mesenteric arteries so that un expected complications of possible interventional difficulties can be prevented. These anomalies can be displayed with routine abdominal CT examinations with intravenous contrast medium administration.

RHINOSINUSAL POLYPOSIS AND METALS: MORPHOLOGICAL ASPECTS

Yolande ASARA[1], Roberto Madeddu[1], Andrea Melis[2], Laura DELUCA[2], Paolo Castiglia[1], Juan A. MARCHAL[3], Maria Alessandra SOTGIU[1], Pasquale BANDIERA[1]
[1]University of Sassari, Dept of Biomedical Sciences, Italy, *[2]Univ. of Sassari, ENT Clinic, Dept of Surgery, Microsurgery and Med. Sciences, Italy*, *[3]University of Granada, Dept of Human Anatomy and Embryology, Faculty of Medicine, Spain*

Aim: Metals have strong toxic effects in humans and can act as immunoregulatory factors. The purpose of our study was to determine whether the concentrations of metals are associated with the clinical course of nasal polyposis (NP). Methods: We measured the concentrations of 10 metals (Zn, Mn, Se, Fe, Cr, Ni, Pb, Al, Cd, and Cu) in 58 patients with NP, and 29 controls with a healthy nasal mucosa. We used electron microscopy to compare the ultrastructural features of the nasal mucosa between NP patients and healthy controls. Methods: Concentrations of metals in nasal polyps and healthy mucosa were determined by mass spectrometry. Transmission electron microscopic (TEM) and scanning electron microscopic (SEM) images of the nasal mucosa were obtained. Results: The mean tissue concentrations of all 10 metals were significantly lower in NP patients than in healthy controls ($P < 0.001$). Tissue concentrations of each metal were lower in stages III and IV NP than in stages I and II NP, although the differences were not statistically significant. TEM and SEM revealed changes in the mucosal ultrastructure in NP with progression from isolated polyposis (stages I and II) to massive polyposis (stages III and IV) with progressive fibrosis, devascularisation, and inflammation. Conclusion: Tissue concentrations of metals were lower in NP patients than in healthy controls, and this was particularly evident in massive polyposis. Polyp structure could contribute to the lower concentrations of metals by exposing the tissue to increased oxidative stress.

BIOMECHANICAL MODELLING AS A PROGRESSIVE TOOL IN CLINICS AND CLINICAL ANATOMY

Vaclav BACA[1,2,3], Z HORAK.[2,3], M. OTCENASEK[2,4], D. KACHLIK[5], R.GRILL[2,4], V.DZUPA[2,6]
[1]Charles Univ. in Prague, Dept of Anatomy, Third Faculty of Medicine. [2]Charles Univ. in Prague, Center for Integrated Study of Pelvis, Third Fac. of Medicine. [3]College of Polytechnics Jihlava. [4]Charles Univ. in Prague and FNKV Prague, Dept of Urology, Third Fac. of Medicine, [5]Charles Univ. in Prague, Dept of Anatomy, Second Fac. of Medicine. [6]Charles Univ. in Prague and FNKV Prague, Dept of Orthopaedics and Traumatology, Third Fac. of Medicine. Czech Republic

Clinical anatomy represents a specific field that should bring answers to the questions of clinicians how to get the most from the structure and mechanical properties of the human body for the benefit of the planned medical intervention. This is to ensure that the diagnostic or therapeutic procedure was carried out with the least possible risk and maximized efficiency, therefore, the greatest benefit for the patient. It is not about a stark description of the topographical situation, but about the relationship of the situation to the possibilities of what the least destructive approach, grafting or implantation and, last but not least leading to consequential functionality and reliability. Following the development of technology and the usage of specific technical devices and instruments is preferably not only to understand the biological processes, but also the mechanical properties of the biological material (tissue) and implanted artificial compensations, plates and screws. It is not only the mechanical tests, in case of living

organisms there are simulation tools that enable virtual modeling of the load and thus predict the behavior of a biological system at physiological load and after surgery (e.g. in orthopedics and traumatology, urology and gynecology). Combining technical expertise and knowledge of the properties and behavior of the organism deals with biomechanics, which in conjunction with the anatomy, especially topographical and developmental ones, can bring answers to many questions that clinicians bring from their medical practice. Supported by grant CZ216/3100/24018 (INO/02/01/0017/2010)

THE IMPORTANCE OF ANATOMICAL LANDMARKS DURING PELVIC LYMPH DISSECTION FOR CERVIX CANCER

Nicolae BACALBASA[1], Claudia STOICA[1], Ileana GIUVARASTEANU[1], Radu SGARBURA[2]
[1]Univ. of Medicine & Pharmacy "C. Davila" Bucharest, Clinical Hosp. Cantacuzino, Dept of Obstetrics & Gynecology, [2]County Emergency Hosp. Ilfov, Gral Surgery Dept, Romania

Pelvic lymphadenectomy associated with radical total hysterectomy is considered an important part in the surgical management of cervical cancer. The aim of this paper is to demonstrate the importance of anatomical landmarks for a complete pelvic lymph node dissection in cervical cancer. Methods: A group of patients with cervical cancer (with early or invasive stage tumors) have undergone primary radical total hysterectomy with pelvic lymph dissection to which we applied the principles of surgical oncology. We have performed sharp dissection technique for removing all the pelvic lymph nodes located around the iliac vessels beginning from the common and external iliac artery down to the obturator fosse. Results: Intraoperative images taken during radical hysterectomy demonstrate the anatomical landmarks for the limits of lymph node dissection .The uppermost limit is at about 2 cm above the bifurcation of the common iliac vessels, the lateral limit is the psoas muscle with the genitofemoral nerve, the medial limit is the ureter and the inferior limit is represented by the obturator nerve. Conclusion: The anatomical landmarks for pelvic lymph node dissection contribute to the removal of all nodal tissues with prognostic value after their histopatological examination. Therefore, they contribute to an appropriate staging of the disease and finally to an adequate oncological treatment.

THE SUPERIOR MESENTERIC ARTERY- ITS SURGICAL IMPORTANCE IN ONCOLOGIC DIGESTIVE SURGERY

Nicolae BACALBASA[1], Claudia STOICA[2], Beatrice LINTOIU-URSUT[3], Ileana GIUVARASTEANU[2]
[1]Univ. of Medicine and Pharmacy "Carol Davila" Bucharest, Clinical Hosp. Cantacuzino, Dept of Obstetrics & Gynecology, [2]Univ. of Medicine and Pharmacy "Carol Davila", Dept of Anatomy, Clinical Anatomy and Surgical Techniques, [3]Agripa Ionescu Clinical Hosp., General Surgery Dept, Romania

The superior mesenteric artery approach is the “anatomical key” to establishing the invasive grade of tumors in pancreas, stomach, colon or small intestines. The purpose of every oncologic surgical intervention is removal of the central lymph nodes all together with the primary tumor. Thus, for tumor ablation it is necessary to directly visualize the course of the superior mesenteric artery and the mesentericoportal axis (in case of pancreatic head cancer), and for radical lymphadenectomy it is mandatory to expose the origin of the superior mesenteric artery. Methods. We performed duodenopancreatectomy in patients with pancreatic head carcinoma, radical right colectomy for ascending colon carcinoma and total gastrectomy for antral carcinoma. Result. The intraoperative images demonstrate the role of “anatomical” dissection in avoiding vascular injury and that it is based on clear visualization of the anatomical elements that allow a good exposure of the superior mesenteric artery and a complete removal of the lymph nodes. Adequate exposure of superior mesenteric artery origin requires duodenopancreatic mobilization and mobilization of the right and transverse colon. Conclusion. Superior mesenteric artery exposure is important in the surgical management of digestive tumors, radical or palliative, and also it is essential for subsequent oncologic theraphy.

3D PRINTING ANATOMICAL MODELS

Mickael BARTIKIAN[1], Angélica FERREIRA[1], Lia L.NETO[1,2], António GONÇALVES-FERREIRA[1,3]
[1]Lisbon Medical School, Anatomy Dept, [2]Santa Maria University Hosp., North Lisbon Medical Center, Neuroradiology Dept, [3]Santa Maria University Hosp., North Lisbon Medical Center, Neurosurgery Dept. Portugal

The teaching of Human Anatomy is one of the essential pillars of medical education. The increasing number of students, the reduction of contact hours, the shortage of cadavers, and the excessive time that is required to perform a dissection, have diminished this practice. Nowadays, the study of Anatomy is mostly based on images and plastic models. Specimens conserved in formaldehyde and individual bones are scarce and very fragile, thus limiting their handling and the possibility for the students to study at home. To respond to these restrictions, several projects have been conducted in our Institute in order to create plastinated anatomical models of the brain. These models achieved a very positive feedback from the community in our faculty. We are now developing a new project where we use a 3D printer to produce models of the bones of the head, with high quality and sufficient quantity to satisfy the needs for Anatomy classes and also to be available for request to study at home. We selected regular and well-shaped bones of the head upon which we based the 3D models. These bones were scanned…We have printed successfully a few models of the head bones, such as the temporal, sphenoid, ethmoid and also a skull base. The efficiency of the production process and its pros and cons are discussed. The potential of 3D printing to create more complex models (e.g. regional, vascular, nervous system structures) that would allow a similar experience compared with a dissection is also reviewed.

LEFT RENAL VEIN ANOMALIES IN ROUTINE ABDOMINAL CT SCANS

Abdussamet BATUR[1], Serdar KARAKOSE[2], Alpaslan YAVUZ[1], Aydın BORA[1]
[1]Yuzuncu Yil University, Radiology, [2]Necmettin Erbakan University, Interventional Radiology, Turkey

Objective: The purpose of this study was to investigate the incidence of left renal vein in routin abdominal computed tomography scans. Methods: One thousand and four patients (590 men, 414 women) were evaluated retrospectively with routine abdominal computed tomography scans. Results: Sixty three patients of 1004 were identified with renal vein variants (6.3%). Fourty three (4.3%) patients exhibited retroaortic left renal vein and twenty (2 %) patients had circumaortic renal veins. Conclusion: The incidence of renal vein variations observed in this study is discussed and compared with that reported in the literature. It is necessary to emphasise that the presence of these renal vein variations in particular must be acknowledged since they have significant clinical importance.

ANATOMY OF MASTER KNOT OF HENRY: A MORPHOMETRIC STUDY ON CADAVERS

Orhan BEGER[1], Özlem ELVAN[1], Burçin ÜN[1], Deniz UZMANSEL[1], Mert KESKINBORA[2]
[1]Mersin Univ., Anatomy, [2]Istanbul Medipol Univ., Turkey

Aim: The objective of this study was to evaluate the features of flexor hallucis longus (FHL) and flexor digitorum longus (FDL) regarding the tendon grafts and to reveal the location of Master Knot of Henry (MKH). Methods: Twenty feet from ten formalin fixed cadavers were dissected. The location of MKH was identified. Interconnections of FHL and FDL were categorized. According to certain incision techniques, lengths of FHL and FDL tendon grafts were measured. Results: MKH

was 12.61±1.11 cm proximal to first interphalangeal joint, 1.75±0.39 cm below to navicular tuberosity and 5.93±0.74 cm distal to medial malleolus. The connections of FHL and FDL were classified in 7 types. Tendon graft lengths of FDL according to medial and plantar approaches were 6.14±0.60 cm and 9.37±0.77 cm, respectively. Tendon graft lengths of FHL according to single, double and minimal invasive incision techniques were 5.75±0.63 cm, 7.03±0.86 cm and 20.22±1.32 cm, respectively. Conclusion: The exact location of MKH and slips was determined. Two new connections not recorded in literature were found. The awareness of connections between the FHL and FDL, and which are participated in the formation of long flexor tendons of toes, could be important for reducing possible loss of function after tendon transfers postoperatively.

THE SUPRAORBITAL VASCULAR-NERVE BUNDLE WITH REGARD TO FRONTAL MIGRAINE HEADACHE

Valeria BERCHTOLD[1], Erich BRENNER[1], Bernhard MORIGGL[1], Reinhard PAUZENBERGER[2], Marko KONSCHAKE[1]

[1]Dept of Anatomy and Histology, Clinical and Functional Anatomy, Medical Univ. of Innsbruck, [2]Dept of Surgery, Division of Plastic and Reconstructive Surgery, Vienna Medical University, Austria

Aim: Recent findings on the pathogenesis of migraine headache support, besides a central vasogenic cause, an alternative peripheral mechanism involving compressed craniofacial nerves. Botulinum Toxin injections as a new treatment approach for migraine headache patients demonstrate efficiency and support this peripheral mechanism, too. Methods: The supraorbital region of 11 alcohol-glycerin fixed specimens of both sexes was dissected. Both the supratrochlear (STN) and the supraorbital nerve (SON) were identified and their topographic relationship with the corrugator supercilii muscle (CSM) investigated. The shape of the exit from the orbit of both nerves was defined, interaction of the supraorbital artery (SOA) and the SON determined. Results: We showed a new possible compression point of the STN running through the orbital septum. We verified previously described compression points of both STN and SON. Osteofibrose channels, varying in size (Typ I-III) and always being passed by STN and SON, were found constantly. Different types concerning the topographic relationship between STN and CSM (Typ I-V), SON and CSM (Typ I-IV) and SON and SOA (Typ I-IV) were described. Conclusion: Our data support the hypothesis of an alternative peripheral mechanism for frontal migraine headache. The CSM is constantly perforated by the SON, and frequently by the STN, too. The topographic proximity between SOA and SON and the osteofibrose channels, being passed by SON and STN, should also be considered as points of potential irritation. A surgical release and Botulinum Toxin-induced paralysis can therefore result in amelioration of frontal migraine headache.

DESIGN OF EXTRACURRICULAR DISSECTION COURSE FOR STUDENTS OF GRADUATE ENTRY MEDICINE (GEM) PROGRAMME

Marcela BEZDICKOVA, Samuel WEBSTER

Swansea University Medical School, United Kingdom

The main objective of this study was to find the best design for an extracurricular dissection course for medical students… This group of students study anatomy but do not dissect cadavers within their medicine curriculum. They have limited extra-curricular time, varying abilities and a range of academic backgrounds. The aims of the course were to introduce dissection methods of cadaveric human tissue and to provide more detailed study of a particular region… of anatomical structures (thickness of structures, anatomical differences, positions, relationships, etc.). By the end of the course students were expected to be able to communicate this anatomical knowledge to other groups. We organized two extracurricular voluntary dissection courses during the 2015-2016 academic year and offered it to the students of the 2nd year of GEM. The total length of the course was 15 hours in 6 sessions for a maximum of 15 participants. The first course covered the dissection of upper and lower limbs, and was designed as a self-directed learning (SDL) course. The second course covered organs and topography, and was fully guided with academic supervision. The students completed questionnaires before and after each course. Students felt more confident when they were guided but preferred a level of independence when dissecting… Students were keen to take part in extracurricular dissection courses when no dissection occurred during the curriculum, even with limited study time available to them. Demonstrator guided dissection with encouraged preparation before each session through study and presentation was important…

DEVELOPMENT AND CLINICAL IMPLICATIONS OF THE ABDOMINAL WALL IN FETUSES

Susana N. BIASUTTO

Faculty of Medical Sciences, National University of Cordoba, Normal Anatomy, Argentina

Muscles of the abdominal wall are well developed in fetuses older than 10 weeks of gestation instead there are further changes in the structures depending on them. The objective was to study some of these changes, mainly those related to the inguinal canal and the arcuate line. Seventy five fetuses between 10 to 25 weeks of gestation, 42 males and 33 females, were dissected. We identified the characteristics and contents of the inguinal canal, the insertion and distribution of the gubernaculum tails, the characteristics of the rectus abdominis muscle and relation between arcuate-pubis length and linea alba length. Muscular-fibrous layers of the wall were well-differentiated in all fetuses. The relation between the position of deep and superficial rings is important to explain the particular aspect of inguinal canal. The presence of multiple tails (1 to 4), with different insertions, at the distal end of the gubernaculum was frequent in both genders. We found the absence of left rectus abdominis muscle in one case. The thickness of the anterior rectus abdominis sheath did not vary upper to lower the level of the arcuate line. The arcuate line position (measured from the pubis) changed significantly from one to other fetus and represented 1/7 to 1/3 of the linea alba. Deep inguinal ring moves upwards, bringing the gubernaculum along with it and determining the final aspect of the inguinal canal. This movement is associated to the arquate line varying distance from the pubis. Gubernaculum tail insertions explain the location of ectopic testis.

THIN SLICE SILICONE PLASTINATION OF HAND

Okan BILGE, Servet ÇELIK, Koçer İ. BAYZIT, Mustafa D. YÖRÜK

Ege University School of Medicine, Dept of Anatomy, Turkey

One hand of an amputated limb was obtained from the pathology department as a fresh specimen. The arteries were filled with polyester (Poliya 354 + Polipigment red) via cannula…. 2-3 mm thick coronal slices were obtained from the frozen specimen using a saw machine. …After one month of fixation with %10 formalin solution, xylene added (X/S ratio: 1/1) silicone reaction mixture (Biodur S10+S3) was used for impregnation at room temperature… The plastinated slices are good of quality and color, durable, semi-flexible, semi-transparent and have fine details of many anatomical structures comparable with radiological images. The arteries of the hand are in traceable clarity from the palmar arches to the tip of the digital arteries. Using xylene as an additive to impregnation mixture ensures lightweight plastinates and lower costs. Also assures a realistic tactile sense of structures like bone, muscle, tendon etc. The slices are easy to handle and to evaluate. The preparation is easy and less expensive relative to other plastination methods (epoxy and polyester) and standard silicone plastination. There is no study in the literature of thin slices of hand with filled arteries which were prepared and plastinated using the process as described in this study.

SURFACTANT PROTEINS OF THE HUMAN LARYNX

Lars BRÄUER[1], Michelle SHEATS[1], Henrik SCHRÖDER[1], Christopher BOHR[2], Franziska KIßLINGER[2], Heinrich IRO[2], Fabian GARREIS[1], Martin SCHICHT[1], Friedrich PAULSEN[1]
[1]Friedrich-Alexander-Univ. Erlangen-Nürnberg, Instit. of Anatomy, [2]Friedrich-Alexander-Univ. Erlangen-Nürnberg, Dept of Otorhinolaryngology. Germany

Purpose: Surfactant proteins (SPs) originally known from lung tissue are important players of the innate immune system. Beyond this they contribute to stability and rheology of gaseous or aqueous interphases. In the present study we determined the expression and presence of SPs (A, B, C and D) in different areas of the human larynx. Methods: mRNA expression of SP-A, -B, -C and -D was analyzed by means of RT-PCR in healthy samples of epiglottis, vocal and vestibular folds, subglottis and trachea. Distribution and localization of all four SPs was analyzed by Western blot and immuno-histochemistry in healthy human tissue samples. Results: All four SPs were detected on mRNA- and protein level in human larynx as well as by means of immunohistochemistry in the different tissue samples of the human larynx. Conclusion: The results reveal that all four SPs are produced with different expression patterns within the human larynx. Based on the known functions our results suggest that SPs might be involved in maintaining mucus rheology and subsequently they could be essential components for proper phonation. Moreover, the proteins seem to play a role in immune defense of the larynx.

DECREASED VERTEBRAL ARTERY HEMODYNAMICS IN PATIENTS WITH LOSS OF CERVICAL LORDOSIS

Mehmet D BULUT[1], Mahmut ALPAYCI[2], Emre SENKOY[2], Aydın BORA[1], Levent YAZMALAR[3], Alpaslan YAVUZ[1], Ismail GULSEN[4]
[1]Yuzuncu Yil Univ., Radiology, [2]Yuzuncu Yil Univ. Medical Fac., Physical Medicine and Rehabilitation, [3]Dicle Univ. Medical Fac., Physical Medicine and Rehabilitation, [4]Yuzuncu Yil University Medical Faculty, Neurosurgery, Turkey

Because loss of cervical lordosis leads to disrupted biomechanics, the natural lordotic curvature is considered to be an ideal posture for the cervical spine. The vertebral arteries proceed in the transverse foramen of each cervical vertebra. Considering that the vertebral arteries travel in close anatomical relationship to the cervical spine, we speculated that the loss of cervical lordosis may affect vertebral artery hemodynamics. The aim of this study was to compare the vertebral artery values between subjects with and without loss of cervical lordosis. Thirty patients with loss of cervical lordosis and 30 controls matched for age, sex, and body mass index were included in the study. Sixty vertebral arteries in patients with loss of cervical lordosis and 60 in controls without loss of cervical lordosis were evaluated by Doppler ultrasonography. Vertebral artery hemodynamics, including lumen diameter, flow volume, peak systolic velocity, end-diastolic velocity, and resistive index, were measured, and determined values were statistically compared between the patient and the control groups. The means of diameter (p=0.003), flow volume (p=0.002), and peak systolic velocity (p=0.014) in patients were significantly lower as compared to controls. However, there was no significant difference between the 2 groups in terms of the end-diastolic velocity (p=0.276) and resistive index (p=0.536) parameters. The present study revealed a significant association between loss of cervical lordosis and decreased vertebral artery hemo-dynamics, including diameter, flow volume, and peak systolic velocity.

PHOTO-REALISTIC STATISTICAL EXEMPLARS OF SKULLS: VISUALIZING AVERAGE SEX AND ANCESTRY IN HIGH-RESOLUTION FOR FORENSIC ANTHROPOLOGY

Jodi M. CAPLE, Carl N. STEPHAN
The University of Queensland, Australia

Current depictions of skulls for different sex and ancestral groups have relied on subjectively drawn diagrams that accentuate typical morphology or on photographs of single skulls as holotypes or type specimens… Subjective holotypes can, therefore, be replaced by these more objective photo-realistic statistical images to improve references standards used in casework and teaching. Standardized photographs were taken of skulls in anterior and left lateral views, sourced from the Pretoria Bone Collection, the WM Bass Donated Skeletal Collection, the Robert J. Terry Anatomical Skeletal Collection, the Hamann-Todd Human Osteological Collection, and the Chiba Bone Collection…From these delineation maps, the average skull shape was calculated before warping the color information from each individual image to the average shape, and blending each pixel together. Stepwise transformations of the exaggerated exemplars were then generated in +1 % increments. The goal was to transform up to a final step value of +100 %; however, some images were subject to distortion at this level and therefore stopped at a lower percentile… Similar goes for the relative absence of alveolar prognathism in Whites, large anteriorly projecting nasal bones, with a prominent chin, and tall thin mandibular ramus. Their development also potentially provides new opportunities to identify other, previously unrealized, characters useful for sex and ancestry estimation. A graphical user interface (GUI) will also be made available at craniofacial identification.com, enabling user-defined viewing of any combination of sex or ancestral group transformations from this study.

THE FIBER DISSECTION TECHNIQUE; SYSTEMATIC ANATOMIC LATERAL APPROACH

Servet CELIK, Okan BILGE, Lokman OZTURK, Canan YURTTAS
Ege University Fac. of Medicine Dept of Anatomy, Turkey

Development in magnifying techniques and microneuro-surgery was necessitated to the neurosurgeon research fibers pathways anatomy and make practice on cadavers brains. Because of this fact there is limited researches executed in recent literature by anatomist despite of the clinicians especially neurosurgeons. The fiber dissection technique of the brain is important not only for neurosurgeons but also for anatomist. Only with clinical view or disregarding of aspect of anatomist cause terminological and descriptive confusion of terms and preparation methodology of the fibers. The aim of the study was to evaluate possibility of technique and determine steps of the brain fiber dissection of the lateral surface in systematic anatomic manner. We dissected lateral surface of seven hemispheres. Respectively cortex and the white matter of the frontal, parietal, occipital and temporal lobes were dissected. Steps of the technique was determined in systematic manner and terminology of the structures are described according to anatomical terminology

THIN AND LIGHTWEIGHT SLICE SILICONE PLASTINATION OF FOOT

Servet ÇELIK, Okan BILGE, Mustafa D YÖRÜK, Koçer İ BAYZIT
Ege University, School of Medicine, Dept of Anatomy, Turkey

One foot of an amputated lower extremity was obtained from the pathology department as a fresh specimen. It was positioned, precooled at 4°C in refrigerator for one night and stored in -80°C for following five days. 2-3 mm thick, sagittal slices were obtained from the frozen specimen using a saw machine. All slices were placed between wire meshes serially. After one month of fixation with %10 formalin solution, cold acetone baths for dehydration and degreasing at room temperature in last acetone bath were done. Standard silicone plastination method was used with some modifications. Xylene added (X/S ratio: 1/1) silicone reaction mixture (Biodur S10+S3) was used for impregnation at room temperature. Curing of slices was carried out in a gas curing chamber in which the specimens were exposed to S6 vapors at room temperature. The added xylene was removed from the slices using vacuum chamber after curing. Thin slices of the foot were produced using a modified S10 plastination

method. The plastinated slices are good of quality and color, durable, semi-flexible, semi-transparent and have fine details of many anatomical structures comparable with radiological images. Using xylene as an additive to impregnation mixture ensures lightweight plastinates and lower costs. Also assures a realistic tactile sense of structures like bone, muscle, tendon etc. The slices are easy to handle and to evaluate. The preparation is easy and less expensive relative to epoxy and polyester procedures. There is no study in the literature of thin slices of musculoskeletal specimens which were prepared and plastinated using the process as described in this study.

DERMATOGLYPHIC FEATURES IN SCHIZOPHRENIA AND PSORIASIS IN PATIENTS OF MACEDONIAN NATIONALITY

Elizabeta1 CHADIKOVSKA, Dobrila1 LAZAROVA, Natasa1 NAKEVA-JANEVSKA, Biljana1 ZAFIROVA, Bojadzieva STOJANOSKA, Biljana TRPKOVSKA
Medical Faculty, Institute of Anatomy, Macedonia

Clinical dermatoglyphic study has been conducted with purpose to determine and analyse dermatoglyphic patterns in patients with schizophrenia and psoriasis. Palm prints were taken using Cummins and Midlo ink method. In clinical examinations 240 palm prints from patients with psoriasis and 218 palm prints of both hands in clinically confirmed patients with schizophrenia were obtained. Palm prints were also obtained from 200 healty individuals of Macedonian nationality (100 males and 100 females). Twenty dermatogliphic parametars on the palm prints have been read and the data were classified and correlated between the examined groups. In patients with schizophrenia we have found more fibular loops and less whorls compared to the healthy examinees. Arches are more aboundat in males but less present in females. Atd angle has lower values in patients. The numbers for TRC и ATRC are also lower in the group of patients. AB, BC and CD ridge count have lower values in females, but higher values in male patients. For patients with psoriasis significant is higher values for ulnar loops…In conclusion variability of the dermatoglyphic patterns in some clinical conditions have been presented. The results provide new possibilities for further investigation of dermatoglyphics and their biological and genetic properties. Differencies found in the clinical dermatoglyphic research should be considered as marks who give us possisbility to include them in early detection, screening purposes of schizophrenia and genetic research in psoriasis in the populationes with certain risk.

FOOT AND ANKLE JOINTS MOVEMENT OF DANCERS AND NON-DANCERS: A COMPARATIVE STUDY

Ho-Jung CHO[1], So-Yeon KIM[1], In-Beom KIM[1], Joon-Yong JUNG[2], Dai-Soon KWAK[1]
[1]The Catholic Univ. of Korea, Catholic Institute for Applied Anatomy, [2]The Catholic Univ. of Korea, Dept of Radiology, South Korea

Dancers have more frequent injuries on foot and ankle joints than ordinary people… Therefore, this study observed and compared ankle joint movements between ballerinas and ordinary people using x-ray images which are used for Interventional Radiology (AXIOM Artis, Siemens). All 14 female participants were over 18 years of age. Seven non-dancers (mean age: 25.6 years) and seven ballet dancers (mean age: 20.3 years, mean training periods of ballet: 11.0 years). We took x-ray images of foot and ankle joint in each position from dorsi flexion to plantar flexion. Ranges of motions (ROM) of ankle were measured against the standing position…The mean ROM of dorsiflexion was 34.6° for non-dancers and 23.9° for dancers. The mean ROM of plantar flexion was 54.8° for non-dancers and 73.5° for dancers. There was significant differences in ROM of borth dorsi and plantar flexion between non-dancers and dancers ($P = 0.01$ and $P < 0.01$, respectively). The mean total ROM throughout dorsi to plantar flexion was calculated as 89.4° in non-dancers and 97.4° in dancers. In neutral position, dancers' feet were found to be more inclined towards the plantar site. The highest ratio of movement was shown at the talocrural joint in both dancer and non-dancer groups… During dorsi flexion, the ratio of the talocrural joint of dancers was higher than that of non-dancers by 10%, but other joints showed lower ratios for dancers compared to non-dancers…

CAN WE LEARN FROM STUDENTS' MISTAKES? - A RETROSPECTIVE ANALYSIS OF ANSWERS AT PRACTICEANATOMY.COM

Marek CIERNY[1], Jan PAPOUSEK[2], Vit STANISLAV[2], Linda KASICKOVA[2], Ondrej VOLNY[3], Radovan HUDÁK[4]
[1]University Hosp. Brno, Dept of Neurology, [2]Masaryk Univ., Faculty of Informatics, [3]Masaryk Univ. and St. Anne´s University Hosp., Dept of Neurology, [4]2nd Fac. of Medicine, Charles Univ. in Prague, Dept of Anatomy. Czech Republic

Recognizing and naming the anatomical structures on images is an essential initial step in building the knowledge base required for success in pregraduate course of medical anatomy, further study and medical or surgical practice. When a student answers an anatomical question incorrectly, we would expect him to correct his knowledge with further effort. Now, can the teachers learn anything from the pattern of students' mistakes?….PracticeAnatomy.com (Anatom.cz) is a web-based tool for anatomy review featuring 200 anatomical images from popular textbook Memorix Anatomy. 2.300 questions with 1.800 distinct anatomical terms were used. Users review their knowledge by naming a single highlighted structure or recognize a structure of a given name (in Latin, English or Czech). An innovative predictive model evaluates all the previous answers and chooses the next question in order to maintain a stable proportion of correct answers for a given learner, which facilitates motivation, engagement and learning. After summarizing basic visitors' information (language, country, registration status), we aimed to identify anatomical structures that were outliers in the following variables: 1. Item difficulty, 2. Distractibility, 3. Interchangeability, and 4. Retention. All variables were calculated using a model of knowledge based on prior answers. We analyzed 685.000 answers from 25.000 visitors, of whose 1.000 (4%) were registered. Visitors in 90% used Czech user interface (UI) and Latin nomenclature, in 10% English UI and English nomenclature. Aggregate data of learners' answers at large-scale testing tools may provide feedback to teachers and lecturers, with possible implications for medical anatomy teaching.

SURGICAL NEUROANATOMY OF THE MORPHOMETRY AND MORPHOLOGY OF THE SULCI LOCATED AT LATERAL ASPECT OF THE BRAIN HEMISPHERES: A PRELIMINARY CADAVERIC STUDY

Ayhan CÖMERT[1], I. DOGAN[2], E S. AKTAN[3], G KAHILOGULLARI[2]
[1]Ankara Univ., Dept of Anatomy, School of Medicine, [2]Ankara Univ., Faculty of Medicine Neurosurgery Dept, [3]Ankara Univ., Faculty of Medicine, Turkey

Aim: Lateral surface of the brain is important for surgical pterional approaches. Neurosurgeons have to know exact anatomical structures and possible variations for better understanding of undergoing pathology, for surgical approaches, especially for regional neurosurgical approaches. With a neurosurgical point to view the morphology and morphometry need to be clarified. There is need to describe important but simple and practical landmarks. In this study we noted and compared surgical neuroanatomy of of the sulci located at lateral aspect of the brain hemispheres with morphometric values, morphology, asymmetry and relationships with each other and describe their relations with important surgical landmarks. Methods: Measurements including fronto-occipital length, Sylvian fissure length, cerebral width, and distance between anterior Sylvian point and inferior Rolandic points were noted on 30 cadaveric cerebral hemispheres. Measurements were performed and means (min –max, SD) were calculated. The ratios with

fronto-occipital lenght were calculated. Additionally presence of triangular sulcus and diagonal sulcus, Sylvian fissure terminal branch pattern variations were noted and all hemispheres were observed for their variations. Results: Distance between anterior Sylvian point and inferior rolandic point was measured as 26.72 mm at right side and 25.94 mm (min 18.22 mm – max 29.91 mm) and there was not statistical difference between right and left sides. Triangular sulcus was present in most of hemispheres. Anterior horizontal ramus and anterior ascending ramus which are the bordering branches of Sylvian fissure, either have a common stem before separating from each other is less found than when divides right in Sylvian fissure. Most observed divide patterns were defined as U and Y configurations. Conclusion: In our study, the Sylvian fissure length was longer than right side with statistical analysis correlation. Anterior Sylvian point and inferior Rolandic point easily can be recognized during surgery and were practical anatomical landmarks for neurosurgical procedures.

SURGICAL NEUROANATOMY AND THREE-DIMENSIONAL EVALUATION OF PETROUS PORTION OF CAROTID CANAL, SUPERIOR (ANTERIOR) SEMICIRCULAR CANAL, INTERNAL ACOUSTIC OPENING AND CANAL STRUCTURES: A RADIOANA

Ayhan CÖMERT[1], Ihsan DOGAN[2], Mustafa CEMIL KILINC[2], Eyüp S. AL-BEYATI[2]

[1]Ankara Univ., Dept of Anatomy, School of Medicine, [2]Dept of Neurological Surgery, Ankara University School of Medicine, Turkey

It is important to estimate the correct localization of bony formations which are not encountered during subtemporal middle fossa approaches. Instead of existing anatomically visible neural, vascular and bony landmarks above the anterior surface of petrous part of temporal bone, there are also invisible embedded bony compartments preserving and including important structures inside this region. Knowing the morphological and morphometric relation of superior semicircular canal, carotid canal and internal acoustic opening and canal and their relations will provide more safe surgeries. The aim of our study is to evaluate related structures and to discuss their importance regarding surgical planning and evaluation. Three dimensional reconstructed colored images of superior (anterior) semicircular canal, internal acoustic opening (and canal) and carotid canal of 20 patients with no intracranial pathology were created using Osirix software. Three-D reconstructions were performed on 20 CT scans which were imported into the imaging software OsiriX v.3.7.1… The mean angle of carotid canal with midsagittal plane was measured as 120.2 ± 5.9º on the right side and 119.6 ± 6.1º on the left side. The mean angle of internal acoustic opening and canal with midsagittal plane was measured as 75.6 ± 6.4º on the right side, 76.9 ± 6.9 º on the left side…The mentioned anatomical bony structures that protect important neural and vascular elements are prone to intaoperative injury. Preoperative evaluation of locations and morphology of these structures with anatomical landmarks will ensure safe surgeries.

URINARY DISORDERS IN MULTIPLE SCLEROSIS: A REVIEW OF LITERATURE

Paola CRIVELLI[1], Rino A. MONTELLA[1], Pasquale BANDIERA[2], Maria Alessandra SOTGIU[2]

[1]University of Sassari, Dept of Surgical, Microsurgical and Medical Sciences, Institute of Radiology, [2]University of Sassari, Dept of Biomedical Sciences, Anatomy, Italy

Urinary disorders (UD) are frequent complications in Multiple Sclerosis (MS). In MS patients urinary symptoms could include urgency to urinate, urinary incontinence, and retention of urine. The anatomical structures implicated in the control of micturition and continence are the pontine micturition and continence center, the midbrain periaqueductal gray, the hypothalamus, the human cingulate, and prefrontal cortices. Depending on localization of central nervous system lesions, the urological conditions can be detrusor overactivity (DO) or detrusor sphincter dyssynergia (DSD). We carried out a review focusing our interest on the morphological aspects and patho-physiological mechanisms of vescical dysfunction in MS patients with key words "urinary", "bladder", "dysfunction", "multiple sclerosis" with the Boolean operator “AND”. Only manuscripts in English language were selected. Abstracts and unpublished studies were excluded. References of all relevant retrieved articles and of review articles were also manually evaluated in order to find additional articles. Out of 33 selected studies, 4 were conducted on animal MS models; in particular, they showed altered genetic expression associated with bladder mechanosensory, transduction and signaling systems. Only 2 studies performed on human beings assessed morphological changes in MS bladder: Gevaert T et al demonstrated disease-specific changes in the organization and phenotype of interstitial cells of the upper lamina propria of MS bladder, while Radziszewski P et al showed a denser innervation (calcitonin gene related peptide and substance P positive nerve fibers). The other studies correlated type and severity of UD with neuroanatomical lesions in MS patients, or evaluated the correct management of MS patients with UD and their quality of life.: It is crucial to better understand the pathophysiological mechanisms underlying UD for an early and accurate management of the disturbances. Future research should further focus on the complex interplays among the different key bladder elements to get new insights into the MS-related UD pathogenesis.

OVERLAPPING PALLIAL AMYGDALAR PROJECTIONS TO THE NUCLEUS ACCUMBENS AND ADJACENT EXTENDED AMYGDALA IN THE DOMESTIC CHICKEN

András CSILLAG[1], János HANICS[1,2], AlánALPÁR[1,2], Andrea D SZÉKELY[1], Gyöngyi TELEKI[1]

[1]Semmelweis University, Fac. of Medicine, Dept of Anatomy, Histology and Embryology, [2]Hungarian Academy of Sciences, MTA-SE NAP B Research Group of Experimental Neuroanatomy and Developmental Biology, Hungary

The cell clusters of viscerolimbic (extended amygdala (EA)-related) and accumbic relevance are highly interlaced in the ventrobasal forebrain of chicken, making territorial parcellation difficult. This study is aimed at reassessing of the problem in the forebrain of young domestic chicks …Retrograde tracing with choleratoxin B, injected into the nucleus accumbens (Ac) and bed nucleus of stria terminalis, lateral part (BSTL), yielded labeled perikarya in a ring-shaped area of arcopallium, including dorsal and hilar subdivisions, with a wedge-shaped node of dense accumulation in the amygdalopiriform area (APir). The position of source neurons for this arcopallio-subpallial pathway was verified also by anterograde tracing. Three subregions of arcopallium (amygdalopiriform, dorsal, hilar) were injected with dextran (10kDa), and fibers and terminal fields were detected in Ac, BSTL and EA. Most abundant projections to Ac arose from APir. The study enabled precise description of the main output fiber streams of arcopallium: the dorsal stream enters the ventral amygdalofugal tract, and it traverses the EA and the BSTL before reaching the Ac. The ventral stream enters the EA along the ventral subpallial border and terminates in the basal nucleus and ventral pallidum. The course of the pathway was reconstructed in 3D….The findings support the excitatory nature of the arcopallial-accumbens pathway, in agreement with our previous electron microscopic observ-ation in rat and chicken brains, revealing coexistence of L-glutamate and L-aspartate in asymmetric synaptic terminals of amygdalofugal axons in the accumbens core… the source neurons of this pathway extend to a wide field of arcopallium, including neighbouring nidopallial and piriform regions, those fibers terminating most rostrally (i.e. also invading the accumbens) tend to arise from the lateral arcopallial subdivision (APir). Supported by the K-109077 NKFIH-OTKA research grant (A.C.) and the National Brain Research Program of Hungary (MTA-SE NAP B, KTIA_NAP_13-2014-0013 to A.A).

THE ROLE OF INNERVATION IN THE PHYSIOLOGY OF INDUCED PULPITIS OF RAT MOLARS

Dániel CSIZMAZIA, Cynthia BÓTA, Viktória MARTON, Gábor GERBER

Semmelweis University, Department of Anatomy, Histology and Embryology, Hungary

The dental pulp is a richly innervated tissue. Periferal nerves activated by noxious stimulation not only send information to the central nervous system, but can also induce neurogenic inflammation via the axon reflex. Our aim was to investigate the effect of autonomic and sensory nerves on the evoked sterile inflammation in the dental pulp of Wistar rats. The induction of sterile pulpitis was achieved with an ultrasonic scaler without water cooling placed on the lingual surface of the molar tooth for 60, 30, 15 seconds respectively. In the first group of animals (n=4) 2 days before the induction of pulpitis, the inferior alveolar nerve was axotomized leaving the inferior alveolar artery undamaged. In the second group of animals (n=5), the pterygomandibular space was infiltrated with 4% articain (Septanest N) to block the inferior alveolar nerve. 15 minutes after the procedure, sterile pulpitis was induced using the method described above. The third group (n=4) underwent a sham procedure, in which the inferior alveolar nerve was explored surgically, but was not axotomized. The fourth group (n=4) had symphatectomy in which the right cervical superior ganglion was excised. After 2 days, sterile pulpitis was induced with the same method. An intensity dependent rise in the leukocyte count was seen in the dental pulp. Leukocyte count was less in the pulp of the teeth on the denervated, sympatectomised or anesthetized side than on the contralateral side. Our data indicate that both somatic and autonomic nerves may be involved in the development of sterile pulpitis.

PARKINSON´S DISEASE MODELING BY INDUCED PLURIPOTENT STEM CELLS

Mária CSOBONYEIOVA, M VRABCOVÁ, Ľ DANIŠOVIČ., Š POLÁK

Comenius University in Bratislava, Faculty of Medicine, Institution of Histology and Embryology, Slovakia

Parkinson´s disease (PD) is a movement disorder associated with the degeneration of the nigral dopaminergic (DA) neurons. There is currently no effective medication to treat PD. Drug therapies only provide relief of symptoms and have unpredictable side effects. One of the greatest hurdles for PD research is the lack of patient-specific nigral DA neurons for disease modeling and drug discovery. The generation of induced pluripotent stem cells (iPSCs) from somatic cells mediated by transfer of the limited set of transgenes (Oct4, Sox2, Klf4 and c-myc) has a significant impact on Parkinson´s disease therapy without any problems concerning ethics or immunological rejection. iPSC-derived DA neurons might serve as an easily accessible autologous source for cell replacement. Moreover, using a single iPSC line as a universal control to study distinct PD-lined mutation may allow the better understanding of the mechanism by which mutation affects cells and ultimately patients. However, there remain several safety issues restricting the use of iPSC-derived DA neurons in clinical application, such as presence of additional mutations, oncogenic potential of some reprogramming factors, variability between individuals, epigenetic/genetic instability, and the ability to obtain disease-relevant subtypes of neurons. Moreover, increased level of aneuploidy, defects in X-chromosome inactivation and genomic imprinting have been detected in various iPSC lines. Understanding the molecular players involved in human neural differentiation will facilitate the development methods and tools to enrich and monitor the generation of specific subtypes of neurons that would be more relevant in modeling neurological diseases. Recently, a major interest has arisen in gene correction or modification in patient-specific iPSCs to replace defective endogenous genes or modify putative causal genetic variants of individual patients. Succeeding in this purification step will certainly improve the possibility to study specific molecular modification and their consequences in affected cells.

ENGINEERING METHODS IN MIS TRAINING

Nagy DENES AKOS[1;2]

[1]Antal Bejczy Center for Intelligent Robotics, Obuda Univ., Budapest, Hungary. [2]Austrian Center for Medical Innovation and Technology, Wiener Neustadt, Austria

Minimally Invasive Surgery (MIS) was a true revolution in surgical practice. This paradigm shift requireda constant development of surgical techniques. Compared to previous methods where tools (such as forceps, tweezers, etc.) were known and used in the everyday life, these techniques require newly obtained skills and extensive practice to become efficient during surgery, therefore MIS training is an important field of research for both medical doctors and engineers. There are three major concepts along which training frameworks started to develop. (1) Box trainers simulate the physical body of the patient. Their advantage is that the actual surgical tool is used, and as it was one of the first MIS training methods to be deployed in hospitals, it already has verifed task lists for training and evaluation (known as the fundamentals of laparoscopic surgery (FLS)). (2) Virtual Reality (VR) trainers are the other side of the spectrum providing only the operating consols with fully virtual patient side manipulation. It's promising features are that a wide range of patient scenarios can be simulated. It is a field where research done by computer game developers can be harvested, however in most simulators tissue modelling is still lacking essential features and therefore is not realistic enough for excessive training. Lastly of MIS training systems are the (3) Augmented Reality (AR) systems where the physical operation is overlaid with virtual elements… For this phantom, initial trials have been performed both manually and with robotic systems (da Vinci surgical system, CALap system).

MINIMALLY INVASIVE CORONARY ARTERY BYPASS GRAFTING: ANALYSIS OF PRE-OPERATIVE ANATOMICAL ELIGIBILITY PARAMETERS USING COMPUTED TOMOGRAPHY

Kate DILLON[1], Marjorie JOHNSON[1], Ian CHAN[2], Bob KIAII[3]

[1]Western University, Anatomy and Cell Biology, [2]London Health Sciences Centre, Radiology, [3]London Health Sciences Centre, Cardiac Surgery, Canada

The robotic-assisted endoscopic single-vessel small thoracotomy (endo-SVST) bypass procedure is a minimally invasive procedure that confers similar benefits to the conventional full-sternotomy coronary artery bypass re-vascularization... One of the primary intraoperative concerns necessitating conversion is the inability of the endoscopic camera to visualize the left anterior descending (LAD) coronary artery, the target vessel, under the surrounding epicardial adipose tissue. The aim of this study is to determine if patient body mass index (BMI), chest anthropometric parameters, and the thickness of epicardial adipose tissue overlying the target vessel, examined using both patient data and pre-operative computed tomography (CT) images, are able to predict and thus reduce the need for conversion based on effective pre-operative exclusion criteria. Retrospective analysis of patient pre-operative CT angio-graphy scans from both converted (N=17) and robotic-assisted (N=17) procedures using the DaVinci Surgical Robot was performed…Results indicate that patients who successfully underwent the endo-SVST procedure had significantly less epicardial adipose tissue (p=0.002) overlying the LAD in the transverse measurement than those who were converted to the full-sternotomy intra-operatively…These data suggest that a transverse measurement of epicardial adipose tissue overlying the LAD of 7.9±3.2mm may indicate a greater risk for conversion to the full-sternotomy. Using this thickness as the baseline for exclusion reduces the conversion rate for this group by 47%. These data indicate that the relationship between the thickness of epicardial adipose tissue and

conversion to full-sternotomy can't be fully explained by a patient's BMI and chest anthropometrics...

PERSISTENT PRIMITIVE TRIGEMINAL ARTERY DETECTED BY COMPUTED TOMOGRAPHY ANGIOGRAPHY

Ace DODEVSKI[1], Dobrila LAZAROVA[1], Marija PAPAZOVA[1], Julija ZHIVADINOVIK[1], Niki MATVEEVA[1], MenkaLAZARESKA[2], Vjolca ALIJI[2]
[1]Medical Faculty, Institute of Anatomy, [2]University Clinic of Radiology, Neuroradiology, Macedonia

Introduction: Persistent trigeminal artery is the most common primitive carotid basilar anastomosis that persists in adulthood. The overall incidence of persistent trigeminal artery is between 0.2 to 0.6%. Persistent trigeminal artery are known to be associated with a wide range of pathology. The aim of this study was to describe the morphological characteristics of the persistent trigeminal artery and to emphasize their clinical significance. Materials and methods: We examined radiographs of 234 patients who had CT angiography undertaken for a variety of clinical reasons, performed as a part of their medical treatment at the University Clinic for Radiology in Skopje, R. Macedonia. The study population included 234 patients, 130 male and 104 females, age range from 19-83, mean age 57.8 years. Results: In one patient we found persistent trigeminal artery with overall incidence of 0.42%. CTA revealed a left persistent trigeminal artery that arise from the C4 segment of internal carotid artery and communicate with the basilar artery between the origin of the anterior inferior cerebellar arteries and the superior cerebellar arteries. Conclusion: Although anatomically interesting, an awareness of the anatomy and variations of the brain arteries is clinically important for radiologists and surgeons for save performance of procedures, and forensic pathologists since variants may have forensic consequences.

UNUSUAL SHAPES OF LATERAL PLICA IN ADOLESCENTS

Luka ĐUDARIĆ, Sandor ROTH, Olga CVIJANOVIĆ, Dragica BOBINAC
Faculty of Medicine of the University of Rijeka, Department of Anatomy, Croatia

Synovial plicae in the knee joint are remnants of embryonic mesenchyma filling the space between the femur and tibia... Formation of the joint cavity begins…as a result of programmed resorption of the mesenchymal tissue… Once the mesenchymal tissue is completely resorbed, the knee joint cavity is formed as a single space… There are 4 types of knee synovial plicae: infrapatellar, mediopatellar, suprapatellar and lateral. Our aim was to present three unusually formed residual plicae in the suprapatelo-lateral space of the knee, discovered by arthroscopy. Unusual intraarticular structures, resembling ligaments, were found in three children (age: 12-14). Synovial plicae stretched from the medial suprapatellar to the lateral part of the articular capsule pulling the patella laterally to causeluxation. After the structures were removed surgically, tissue samples were obtained and treated by antibodies against collagen type I and collagen type III. Longitudinal histological slides were stained by HE, and on each slice central and peripheral zones were recognized. The central zone consisted of collagen fibers with few fibroblasts. Blood vessels were very rare. The peripheral zone consisted ofa synovial sheet with a stratified epithelium containing blood vessels. Here the collagen fibers were not parallel. Immunohistochemical analyses revealed numerous type III collagen fibers, localized in the blood vessel's wall and in adjacent stroma. In addition, type III collagen fibers were located beneath epithelial layer. Only few immunopositive type I collagen fibers were detected, with overall prevalence of the type III collagen fibers…

PUBLISHING IN ANATOMY: A TEN YEARS EXPERIENCE AS EDITOR IN CHIEF OF SURGICAL AND RADIOLOGIC ANATOMY. REFLECTIONS AND PERSPECTIVES

Fabrice M. DUPARC
Anatomy, Rouen University, France

Publications in the fields of anatomy and clinical anatomy have evolved considerably within the last ten years, and our aim was to select a few parameters for evaluating these changes. Some adjustable variables have been used for showing the evolution of the editorial activity: numbers of submissions, accepted manuscripts, revisions, rejected manuscripts, countries of origin; delays between submission and first decision or final acceptation. The number of participants to the Editorial board has also been used for assessing the development of the activity. The quality of the submissions has been assessed through the number of submissions presented with full agreement to the Instructions for Authors of the journal. The Impact Factor of the journal has been recorded. Three sections have been chosen as markers of activity: Original articles, Anatomical Variations, Teaching Anatomy. The increasing of submissions has been about 328% within 10 years, and the acceptance or revision decisions remained stable, but the rejection rate moved from 54% to 72%. The electronic submission made shorter the editorial procedure. The editorial board grew from 11 to 37. The quality of the manuscripts was improved. The impact factor has been multiplied by 4. Original articles and anatomical variations increasing rates were 91% and 68% respectively. Teaching anatomy remained a small section with poor augmentation. The perspectives for the development of anatomy and clinical anatomy are related to the evolution of anatomy from "basics of the medicine" to "anatomical sciences". Evaluation still needs to be developed about teaching and continuous medical education.

STEP-BY-STEP IMAGING AND SURGICAL ANATOMY TRAINING SYSTEMS DATABASE FOR THE MOST COMMON SURGICAL INTERVENTIONS

Sergey DYDYKIN[1], Dmitry ZHURAVLEV[2], Alexsandr SCHERBYUK[1], Tatiana BOGOYAVLENSKAYA[1]
[1]Sechenov First Moscow State Medical Univ., Dept of Topogracpical Anatomy & Operative Surgery; [2]Molnet. Russia

Virtual learning plays an important role in undergraduate teaching. It is not only aimed at professional orientation of future doctors of a surgical profile, but also should include familiarity with manual skills, control of the camera manipulation tools. The use of interactive educational complexes fill and complement the lack of biological material. A training complex created as a the joint project of the Department of Operative Surgery and Topographical Anatomy by the First MSMU and LLC MOLNET. The training complex can be used bothat the University and ininteractive distance education. Training complexes greatly improve the quality of learning, giving the students an opportunity to experience themself in the operating room and observe the interventions "in the eyes of the surgeon". They learn the manipulation techniques of basic / specialized surgical instruments working with this product. Each simulation complex includes the following components. • Clinico-pathology of diseases needing specific surgical intervention. • Unit diagnostic information composed of different methods (x-rays, ultrasound data, MRI). • Step-by-step animation of the intervention including 3D visualization / animation of the optimal process of surgery. The main steps will be presented with special attention to anatomical structures, tools used, and, major mistakes of novice surgeons. • A test unit to test the assimilation of educational material on specific surgery. Based on the functional, technical and consumer characteristics of the training complex, we assume that the high-tech product with high consumer properties is developed by the results of our development to meet modern trends in education and information technology.

LEVEL INDICATORS OF LIPID PEROXIDATION IN RATS AFTER ADMINISTRATION OF NALBUPHINE

Elvira DZHALILOVA[1], M. LOGASH[1], O. KEFELI-YANOVSKA[2], Y. KRYVKO[1]

[1]Danylo Galytsky Lviv National Medical Univ., Dept of Normal Anatomy, [2]Bogomolets National Medical University, Normal Anatomy, Ukraine

Nalbufin produces short anesthesia followed by increased pain / hyperalgesia. The purpose of our experiment was to study the enzymatic component of antioxidant system and the intensity of lipid peroxidation (LPO) in rats after administration Nalbufin. Male white rats (weight 190-220 gr.) were taken…A significant reduction of SOD in both experimental groups indicates the formation of large quantities of superoxide in the metabolism of nalbufin. SOD, which controls the level of superoxide radicals and nitroksyl converts superoxide into less toxic hydrogen peroxide. This can lead to a direct reaction between superoxide radicals and nitroksyl to form more toxic peroxynitrite. For further neutralization of hydrogen peroxide meet GPO that converts hydrogen peroxide into water and CAT, which converts hydrogen peroxide into water and oxygen… Accumulation of hydrogen peroxide would have lead to activation of lipid peroxidation and increase MDO as the main marker of this process. However, in both groups observed decrease MDO compared with the control group parameters. Moreover, the smallest rate of MDO was in a group of animals in the 10 mg / kg. This fact confirms the previously obtained data on the existence of "scavenger" effect of nalbufin hydrochloride molecule in relation to hydrogen peroxide due to the presence of hydroxyl groups in the structure of nalbufin hydrochloride…Nalbufin hydrochloride causes the formation of superoxide in the process of metabolism with subsequent formation of hydrogen peroxide. Thus, the toxic effects of nalbufin implemented mainly by superoxide and possibly peroxynitrite

PORCINE LIVER VASCULAR CORROSION CASTS – OUR UP TO NOW EXPERIENCE

Lada EBERLOVA[1,2], Vaclav LISKA[1,3], Hynek MIRKA[4,1], Milos SVOBODA[5], Richard PALEK[1,3], Martin SKALA[1,3], Michal EMINGER[1,3], Milena KRALICKOVA[6,1], Alois LAMETSCHWANDTNER[7]

[1]Charles Univ. in Prague, Biomedical Centre, Fac. of Medicine in Pilsen, Czech Rep,, [2]Fac. of Medicine in Pilsen, Charles Univ. in Prague, Dept of Anatomy, Czech Rep., *[3]Charles Univ. in Prague, University Hosp.in Pilsen, Dept of Surgery, Czech Rep.*, *[4]Charles Univ. in Prague, Faculty Hosp. in Pilsen, Dept of Imaging Methods, Czech Rep.*, *[5]Univ. of West Bohemia, New Technology and Materials Centre – CENTEM, Czech Rep.*, *[6]Fac. of Medicine in Pilsen, Charles Univ. in Prague, Dept of Histology and Embryology, Czech Rep.*, *[7]Univ. Salzburg, Dept of Organismic Biology, Austria*

Quality of microvasculatrure is a critical factor of regeneration…Two resins were tested: Mercox II (Ladd Research, Williston, Vermont, USA) and Biodur E20 (Biodur Products, Heidelberg, Germany). 12 porcine livers were filled (both sexes, age 42–105 days, weight 12–45 kg), 6 only via the portal vein (PV), 6 both by the PV and the hepatic artery (HA). The volume injected ranged around 700 ml. Corrosion casts were examined by using: 1. multi-slice human CT (Somatom Sensation 64, Siemens, Forchheim, Germany), slice thickness 0.6 mm, voxel size 0.4 x 0.4 x 0.6 mm, 2. micro-CT (Xradia XCT 400, Pleasanton, CA, USA), the pixel size used for imaging was 17 µm, 9.5 µm and 4.5 µm, 3. scanning electrone microscopy (SEM): specimens were sputtered with gold for 60 s and examined in Stereoscan 250 SEM (Cambridge, U.K.) at an accelerating voltage of 10 kV. Mercox II did not appear to be suitable for the high volume casting. Contrarily to it, Biodur E20 enableds sufficient processing time, it passed through the sinusoids and hepatic venous system. In the casts filled also via the HA, the peribiliary plexuses and vasa vasorum of PV were present. Tortuous, globular structures on the course of sinusoids appeared to be resin extravasations… Supported by the National Sustainability Program I (NPU I) Nr. LO1503 (Ministry of Education Youth and Sports), Specific Research Programme SVV–2016 No 260284, IP 2016–2018 project / Developmental Program (Ministry of Education, Youth and Sports).

PARIETAL LOBE ABNORMALITIES IN CHRONIC SCHIZOPHRENIA: A COMPARATIVE BRAIN SEGMENTATION STUDY

Amani ELFAKI[1], Gudek M ACAR[1], Mert NAHIR[1], Osman T ALI[2], Abdelgani ELSHEIKH[2], Osman A MOHAMED[3], Bunyamin SAHIN[1]

[1]Ondokuz Mayis Univ., Faculty of Medicine, Dept of Anatomy, Turkey, *[2]National Ribat Univ., Faculty of Medicine, Depts of Anatomy, Sudan*, *[3]International Univ. of Africa, Faculty of Medicine, Dept of Psychiatry, Sudan*

Aim: Recent imaging, behavioural and neuropsychological studies in healthy subjects have highlighted the role of the parietal lobe in several cognitive processes. Although parietal lobe abnormality is related to the psychotic disorders, the knowledge about the nature of parietal lobe involvement in schizophrenia is uncertain. This study was designed to assess the volume, thickness and surface area values of the parietal lobe in the patients with schizophrenia in comparison to healthy controls. Methods: 88 control subjects (51 male, 37 female) and 57 schizophrenic patients (30 male, 27 female) participated in the study. The study was approved by the Ethical Committee of the Gezira University/Sudan. Structural magnetic resonance imaging was performed and the DICOM images were evaluated using automatic brain segmentation software (BrainSuite). The volume of the region of interest were evaluated. Results: The mean volume of parietal lobe was smaller in the schizophrenics (114.97 ±10.86cm3) than that of controls (127.85±10.65 cm3), ($p \leq 0.05$). Mean volumes of the parietal lobe grey and white matter in schizophrenics (72.49±7.54 cm3 and 42.47±4.51cm3) were smaller than that of controls (79.40 ±6.77 cm3 and 48.46±5.94 cm3), ($p \leq 0.05$). The mean cortical area pial in schizophrenics (331.83 ±27.01cm2) was smaller than that of control (354.42±27.99 cm2), ($p \leq 0.05$). While no differences found between schizophrenics (4.21±0.19cm2) and controls (4.24±0.20cm2) related to the thickness of the parietal lobe $p > 0.05$). Conclusion: Diminished grey and white matter volume and cortical area of the parietal lobe observed in this study indicate generalized reduction of the parietal lobe volume in schizophrenia, which provide direct evidence for the involvement of this brain region in the schizophrenia. Suggestions of morphological abnormalities in the parietal cortex in schizophrenia may help further our understanding of the pathogenesis of this disorder.

QUANTITATIVE EVALUATION OF THE FRONTAL LOBE ABNORMALITIES IN CHRONIC SCHIZOPHRENIA: A COMPARATIVE BRAIN SEGMENTATION STUDY

Amani ELFAKI[1], Mert NAHIR[1], Gudek M ACAR[1], Ali T OSMAN[2], Abdelgani ELSHEIKH[3], Osman A MOHAMED[4], Bunyamin SAHIN[1]

[1]Ondokuz Mayis Univ., Dept of Anatomy, Turkey, *[2]National Ribat Univ., Dept of Anatomy, Sudan*, *[3]National Ribat Univ., Dept of Psychiatry, Sudan*, *[4]International Univ. of Africa, Dept of Psychiatry, Sudan*

Aim: Frontal lobe dysfunction in schizophrenia has been suggested for many years by several research models. Which is not surprising assumed the importance of this brain region for cognition and behaviour processing, as those two processes are remarkably abnormal in schizophrenia. This study was designed to assess the volume, thickness and surface values of the frontal lobe structures to determine whether patients with schizophrenia have progressive decrease in overall frontal lobe tissue or they have localized volume reduction within frontal lobe. Method: This study included 57 patients with schizophrenia (30 male and 27 female) and 88 healthy controls (51 male and 37 female) matching age, body mass index, and handedness. Structural magnetic resonance imaging was performed and the DICOM

images were evaluated using automatic brain segmentation software (BrainSuite). The volumes of the region of the interest were evaluated. Results: The mean volume of frontal lobe in the schizophrenics (255.87±28.78 cm3) was smaller than that of controls (286.26±26.22 cm3), (p≤0.05). The mean volumes of the frontal lobe grey and white matter in schizophrenics (162.86±18.66 cm3 and 92.91±11.56 cm3, respectively) were smaller than that of controls (180.80±17.81 cm3 and 105.46±11.12 cm3), (p≤0.05). The mean cortical area pial in schizophrenics (692.79±72.08 cm2) was smaller than that of control (746.87±63.84 cm2), (p≤0.05). While, no differences were found between schizophrenics (4,15±0,19 cm) and controls (4,21±0,20 cm) related to the thickness of the frontal lobe (p>0.05). Conclusion: The present results tend to support that patients with schizophrenia have a localized diminished grey and white matter volume and cortical area of the frontal lobe in general comparison between schizophrenics and controls. As well as a generalized frontal lobe reduction confirmed when the total volume of frontal lobe was analyzed.

NEUROANATOMICAL CHANGES OF PATIENTS WITH SCHIZOPHRENIA IN ASSOCIATION WITH THE CLINICAL SYMPTOMS: A COMPARATIVE BRAIN SEGMENTATION STUDY

Amani ELFAKI[1], Aida SARAC HADZIHALILOVIC[2], Ali T OSMAN[3], Abdelrazag ELFAKI[4], Abdelgani ELSHEIKH[3], Osman A MOHAMED[5], Bunyamin SAHIN[1]
[1]Ondokuz Mayis Univ., Faculty of Medicine, Dept of Anatomy, Turkey, *[2]Univ. of Sarajevo, Faculty of Medicine, Dept of Anatomy, Bosnia and Herzegovina*, *[3]National Ribat Univ., Fac. of Medicine, Dept of Anatomy, Sudan*, *[4]Ahfad Univ. for Women, Dept of Psychiatry, Sudan*, *[5]International Univ. of Africa, Faculty of Medicine, Dept of Anatomy, Sudan*

Volumetric magnetic resonance imaging (MRI) studies provided evidence for brain abnormalities in schizophrenia, but their relationship to specific clinical symptoms and syndromes remains unclear. In our study, gray and white matter volumes in the frontal, parietal and temporal lobe regions were analyzed in patients with schizophrenia to investigate the relationship between brain structures and schizophrenic symptoms. We were especially interested in the possible relationship of structural abnormalities with negative and positive symptoms. 57 schizophrenic patients (30 male, 27 female) and 88 control subjects (51 male, 37 female) participated in the study under the ethical approval of the Gezira University/ Sudan. Patients or patient's relatives and controls consented to all procedures. Clinical symptoms of patients were evaluated using Positive and Negative Syndrome Scale. Structural MRI was performed and the DICOM images were evaluated using automatic brain segmentation software (BrainSuite). The volumes of the region of interest were evaluated. Temporal lobe grey and white matter of patients with schizophrenia (110.41±12.55 cm3, 43.81±4.96 cm3, respectively), were less than that of controls (124.14±13.15 cm3, 50.71±6.29 cm3, respectively). Temporal lobe grey and white matter has significant correlation with the most of positive symptoms and some of negative symptoms of patients (P≤0.050). Frontal lobe grey and white matter of patients with schizophrenia (162.86±18.66cm3, 92.91±11.56cm3, respectively), were less than that of controls (180.80±17.81cm3, 105.46±11.12cm3, respectively)… The present study supported that patients with schizophrenia have a generalized brain deficit....

THE ANATOMY OF EXTRACRANIAL PART OF FACIAL NERVE IN HUMAN FETUSES

Özlem ELVAN, Alev BOBUŞ, Mesut S, TEZER
Mersin University, Turkey

The anatomic study of the facial nerve (FN) is closely related to the prevention of nerve injury that may occur in facial and neck surgeries…From this perspective, this study was performed to evaluate extracranial part of FN with emphasis on some important morphometric data; its relationship with apparent anatomic landmarks, facial plane and fasciae; differences between the sexes and possible asymmetry of the right and left sides in human fetuses. Formalin fixed human fetuses (ages varying between 22 and 36 weeks of gestation) were dissected under surgical microscope. Superficial muscular aponeurotic system was continuing with temporo-parietal fascia (TPF) over the zygoma. TPF was multilayered structure and temporal rami was coursing superficially, within and deep sides of the TPF above the superficial layer of deep temporal fascia and merely it coursed on the surface of the superficial layer of deep temporal fascia, but in no case entering into intermediate fat pad…Relations of marginal mandibular and the buccal branches with buccal fat pad, parotid duct, angulus mandibula (as it was not prominent in fetuses) and inferior border of mandible were determined… The branches of FN with relation to certain landmarks were compared with data in the literature. Although there are several reports in the literature about them in adult cadavers, there are limited reports regarding fetuses. So, understanding the microsurgical anatomy of the extracranial part of FN in the fetal period is utmost important to perform surgical procedures without damaging the FN in the early childhood.

F**LEXOR TENDONS OF THE HAND - CLINICAL ANATOMY**

Mirela ERIĆ
Faculty of Medicine, Univ. of Novi Sad, Dept of Anatomy, Serbia

The anatomy of the hand is complex, intricate, and fascinating. Its integrity is absolutely essential for our everyday functional living. The hand is the most refined anatomical terminal device known and the leading edge of the sensorium. Further, the hand is second only to the face in terms of visibility and is a vitally important aspect aesthetic and body image. Hand amputation represents a devastating loss of function and independence. With constant use, it is no wonder that hand injuries are common in population…Tendon injuries are the second most common injuries of the hand and therefore an important topic in trauma and orthopedic patients. The flexor tendons run along the palmar surface of the hand, close to the surface of the skin. Because of that flexor tendon injuries are common. The thumb has one (flexor pollicis longus), while other fingers have 2 flexor tendons (flexor digitorum superficialis and profundus). Verdan divided the flexor tendon into five anatomic zones. Zone II is unique in that flexor digitorum superficialis and profundus are in the same tendon sheath. This zone remain an enigma for the hand surgeons even today but the outcome results have definitely improved due to advances in postoperative motion protocols with development of multistrand core suture techniques. There are five annular and three cruciform pulleys. Fibrous annular pulleys prevent bowstringing, while cruciform pulleys are thin and provide flexibility. The most important are A2 and A4 pulleys.

MORPHOMETRY OF THE AURICLE

Mirela ERIĆ, Dušica MARIĆ, Nikola VUČINIĆ, Todorović S. TOMAŠEVIĆ
Faculty of Medicine, University of Novi Sad, Department of Anatomy, Serbia

The aim of this study was to determine the morphometric parameters, the form of the auricle, and to determine differences in relation to the gender and body side. The research was conducted on 60 subjects (30 males and 30 females), students of the Medical Faculty in Novi Sad, average age 19.10 years….We photographed both auricles in all subjects and we measured nine parameters on each auricle by using a computer program Image J 1.48 v. According to the shape, we classified auricles into four groups. The average length of the auricle was 65.08 mm, and the width was 34.05 mm. The average length of the auricle above the tragus was 29.33 mm, below the tragus was 16.79 mm, while the average length of the tragus was 16.91 mm. The average length of conch was 24.71 mm while conch width was 18.51 mm. The average height of the lobule was

11.05 mm while its width was 18.71 mm. The most common form in males was oval (43.33%) and in females was triangular (40%). The average values of almost all parameters were higher in males than females, except the length of the auricle below tragus and lobule height. There was no statistically significant difference in relation to the body side, but between the genders there were statistically significant differences among almost all of the parameters (except length of the auricle below tragus and lobule height). Compared to the other populations, deviations are minor.

THE IMPORTANCE OF ANATOMY IN THE PREHOSPITAL TRAUMA PATIENT CARE

József FARKAS[1], Márk VAJDA[2], Dóra Reglődi[1], Mátyás RENDEKI[2], Szilárd RENDEKI[2]

[1]University of Pécs, Dept of Anatomy, [2]University of Pécs, Medical School, Dept of Operational Medicine, Hungary

In the traditional medical education anatomy is one of the essential pillars of the curriculum. Due to its early place in the medical studies and the enormous amount of material, anatomy is often considered as a "filter" subject on the way becoming an M.D. Unfortunately, this subject is also considered as the "necessary evil" on the long road towards the medical degree. The fact that anatomy gives a basic viewpoint for the future doctors is often neglected. In most cases problems do not represent themselves as direct anatomical questions (e.g. What are the walls of the pterygo-palatine fossa?), however anatomy is essential in creating a first impression of the patient, moreover it helps doctors to locate the problems within the human body and in relation to other organs and to navigate in the human body during their everyday clinical work. The prehospital patient care is no exception. Professionals need solid anatomical knowledge besides the sub disciplines of trauma patient care to operate effectively. It is a very important feature of pre hospital patient care that not only medical professionals carry out this task. The Department of Operational Medicine and the Department of Anatomy recognized this fact at the University of Pecs Medical School. The aim of the joint work of the two departments was to provide practical anatomical knowledge to non medical first responders (e.g. police officers, fire fighters) as part of broader training programs, which would not only help them to carry out their duties with higher confidence but also to respond to and handle new, unexpected situations. During our work we put special emphasis on the development of new learning materials for primary trauma patient care, which is strongly based on anatomical facts. Besides education the two departments work on research projects.

DISTANCE OF THE EXIT POINT OF THE SUPRACLAVICULAR NERVES THROUGH THE PREVERTEBRAL FASCIA TO THE AREA NERVOSA: TO NEGLECT OR NOT?

Georg C FEIGL[I], Elisabeth AICHNER[1], Carla AVILA[2], Rainer LITZ[2]

[1]Institute of Macroscopical and Clinical Anatomy, Austria, *[2]Department of Anaesthesia, Bergmannsheil, Germany*

Background: Blocks of the area nervosa at the posterior border of the sternocleidomastoideus muscle between the superficial and deep cervical fascia frequently do not reach the supraclavicular nerves. Therefore we measured the distance of the point of perforation of the supraclavicular nerves through the prevertebral fascia to the area nervosa. Materials and Methods: 48 cadavers (96 limbs) embalmed with Thiel´s method were investigated. The area nervosa was dissected and the prevertebral fascia exposed and the exit point of the supraclavicular nerves measured. Results: the trunk of the supraclavicular nerves perforated the fascia in 90 cases in a distance to the area nervosa in 18mm on the right and 29mm on the left sides (Minimal: 0mm, maximal 29mm right and 40mm left). In 6 cases the medial supraclavicular branches had a separate exit area with the same distance. Conclusion: The supraclavicular nerves pierce the pre-vertebral fascia more caudal which need to be taken into consideration when the nerves should be blocked during a block of the sensitive part of the cervical plexus.

THE ANATOMY OF THE INTERSCALENE GAP: EVERYTHING THAT CLEAR FOR EVERYBODY?

Georg C FEIGL[1], Elisabeth AICHNER[1], Carla AVILA[2], Rainer LITZ[2]

[1]Institute of Macroscopical and Clinical Anatomy, Austria, *[2]Department of Anaesthesiology, Bergmannsheil, Germany*

Background: Due to the fact of many different existing block techniques focusing on the interscalene gap there exist many different terms and anatomical interpretations about the spaces and fascias such as extrafascial versus intrafascial, brachial plexus sheath. Method: We base our description on the experience of different publications and the dissection of at least 1000 cadavers in the last 20 years. Results: The use of terms extrafascial and intrafascial as well as brachial plexus sheath comes from misinterpretations of the topo-graphical anatomy. Conclusions: Anaesthetist should contact anatomists not to create artefacts or new not existing anatomical structures.

CLOSING THE GAP- ASSESSMENT OF AN ULTRASOUND GUIDED SELECTIVE VENTRAL BLOCK OF THE AXILLARY AND INTERCOSTOBRACHIAL NERVES: AN ANATOMICAL INVESTIGATION

Georg C. FEIGL[1], Elisabeth AICHNER[1], Christian MATTERSBERGER[1], Carla AVILA[2], Rainer LITZ[2]

[1]Institute of Macroscopical and Clinical Anatomy, Austria, *[2]Department of Anaesthesiology, Germany*

Background: During brachial plexus block at level of the axillary fossa regularly does not reach the axillary and intercostobrachial nerves. An ultrasound guided ventral approach was assessed to block these nerves reaching the upper limb. Materials and Methods: 46 cadavers (respectively 92 limbs) embalmed with Thiel's method were investigated, the upper limb in abducted position. The quadrangular space was identified by distal to proximal guidance. Latissimus dorsi and teres major were identified as well as the quadrangular space with the passing circumflex humeral artery and the axillary nerve. Pulling the needle back, an additional injection was place more medially in the subfascial axillary space. 2ml of latex were injected in each space and dissected after injection. Results: The latex surrounded the axillary nerve in 87 cases and spread ventrally and dorsally to the space as well. In five cases an intramuscular spread was documented, 4 of these five cases were at the very beginning of the investigation. Ventral spread was limited that the radial nerve was reached in 3 cases but median and ulnar nerves were not reached by the latex. The latissimus dorsi and the teres major were easily identifiable and determined to function as important landmarks. The circumflex humeral artery and the axillary nerve were visible in most of the cases, too. Concerning the intercostobrachial the latex surrounded the nerve in all cases. Conclusion: The ventral ultrasound guided approach is performable anatomically and provides clear anatomical landmarks. Both nerves were reached. A learning curve is documented.

MANDIBULAR FIRST MOLAR INTERNAL ANATOMY

Jana FERKOVÁ[1], Květuše LOVÁSOVÁ[1], Darina KLUCHOVÁ[1], Mirela ROZPRÁVKOVÁ[2], Mária MATUŠEVSKÁ[1]

[1]Univ of Pavol Jozef Šafarik, Dept of Anatomy, Slovakia, *[2]Clinic of Dentistry, Palacky University, Dept of Orthodontics, Czech Republic*

First lower molars are teeth which are mostly affected with tooth decay. The cause is especially early age of pruning (6-7 years), parents ignorance about the presence of a permanent tooth between the milk dentition and difficult access for cleaning. If tooth decay is not resolved quickly, it penetrates the tooth nerve and the infection need to be treated with endodontic therapy. Statistically we need to do this

endodontic treatment to 17.4% of the first molars…Two-rooted mandibular first molar located mesially and distally appeared more often in males (avg.80 %) than in females (avg. 70 %) in the most clinical research we studied. About 25 % of the patients in studies had three roots in mandibular first molar. Root canal type IV was the most common type (avg. 90%) in the mesial roots. Average 3% of the patients had 3 mesial canals type VIII and only about1%had one mesial channel type I. On the other hand literature reports to us that the distal roots showed a wide variety of channels configurations. In distal root is found in over 60%one root canal type I, two canals in more than 30%. Tree canals in distal root ale very rarely, about 1%. The high incidence 3 root channels first lower molars shows morphological stability, but different variations, curvatures and communication between channels leads not only to severe endodontic treatment but also to fail of the treatment.

ARE THE HEADACHES MANIFESTATION OF THE SEVERITY OF BRAIN CHANGES IN PTSD SUFFERING PATIENTS?

Branislav FILIPOVIC[1], Branka FILIPOVIC[2], Ana STARCEVIC[1], Milan AKSIC[1], Dubravka ALEKSIC[1], Lazar STIJAK[1], Vidosava RADONJIC[1]

[1]Faculty of Medicine, Univ. of Belgrade, Serbia, Inst. of Anatomy "Niko Miljanic", [2]Clinical and Hospital Center "Bezanijska Kosa", Dept of Gastroenterohepatology, Serbia

Aim. In the present study, we have hypothesized that volume changes of the basal nuclei, hippocampus, thalamus, and lateral ventricle in therapy naive, male PTSD patients are more pronounced in those with headaches. To confirm or reject our hypothesis, we have undertaken an extensive study of forty nine PTSD patients. Methods. We have undertaken an extensive study of forty-nine PTSD male patients that underwent MRI scanning immediately upon admittance for the treatment. Based on headache frequency, they were classified into three groups: group 1 included patients with headaches at least twice a week; group 2 consisted of patients with headaches less than twice a week; and group 3 consisted of patients without headaches. All MRI scans underwent software-based volume compute and statistical processing. The presence of the depression has been evaluated by Hamilton's depression rating scale of 21 items. The severity of depressive symptoms have been correlated with anatomical changes revealed on MRI. Results: 39 out of 49 patients with PTSD suffered from headaches. Bilaterally, volume decreases were noted in groups 1 and 2 compared to group 3 for the caudate nucleus, putamen, hippocampus and lateral ventricle. Differences in globus pallidus and thalamus among groups appeared to be insignificant. Results showed that the intensity of the headaches and the level of the volume decrease correlated with the Hamilton's scores. Conclusion: The present study revealed a bilateral volume decrease of the caudate nucleus, putamen and hippocampus in PTSD male subjects without therapy. Intensity of volume alterations correlated with Hamilton's depression rating score; regression analysis uncovered correlated changes in the caudate nucleus, putamen and hippocampus, and an inverse correlation with the volume of the lateral ventricle in the PTSD patients.

TOPOGRAPHIC ANATOMY RESEARCH THAT CHANGES WHAT WE TEACH. RESEARCH-ENRICHED EDUCATION USING THE WRIST AS AN EXAMPLE

Quentin A FOGG

Monash University, Centre for Human Anatomy Education, Australia

The anatomy applied in contemporary clinical settings is largely based on anatomy learnt in primary health care education, on the job, and through post-graduate courses and conferences. A search of the research literature on any specific region will uncover a multitude of papers questioning this anatomy but offering widely different results. Whilst some clinicians rely on their memory of anatomy learnt in their primary training, others call on the research literature. "Clear" results are often contradicted by other "clear" results based on flawed or poorly communicated research methods; just one of these papers may be taken as conclusive without further critique of the methods used. This is particularly evident in the wrist and hand. Modern textbooks are rarely completely up to date, a natural limitation based on the time they take to write and publish. However, anatomy textbooks are often without changes strongly indicated by the research literature, although this is changing. This study will highlight the differences in wrist anatomy brought about by research and emphasise the clinical importance of these differences. Data from more than 15 years of wrist research (including three PhDs) were collated… Anatomy educators should be encouraged to continue to look at topographic anatomy with scientific rigour, explore the literature in their areas of speciality and work with clinicians to help define the clinical importance of structures emphasised. Demonstrating these differences and results in class will encourage questioning and rationalisation of anatomy, rather than passive memorisation.

AN ANATOMICAL STUDY CONCERNING SUPERIOR REGION OF THE SUPERIOR CONSTRICTOR OF THE PHARYNX

Keiko FUKINO[1], Tomomi SAKAGUCHI-KUMA[1], Kazuo SHIMAZAKI[1], Takashi ONO[1], Keiichi AKITA[2]

[1]Tokyo Medical and Dental University (TMDU), Dept of Orthodontic Science, [2]Tokyo Medical and Dental Univ. (TMDU), Dept of Clinical Anatomy, Japan

The superior constrictor of the pharynx (SC) contributes to swallowing, especially for closure between nasopharynx and oropharynx… This study aimed to examine the precise structure of the most superior fibers of the SC and the relationship with the surrounding muscles. We investigated ten halves of the heads… The heads were cut in the median plane and were dissected from the inner side. The tongue and palatine bone was removed to reveal the constitution of the SC, the tensor veli palatini (TVP) and the levator veli palatine (LVP). In addition, we dissected the most superior fibers of the SC in detail. Removing the mucosal layer of the nasopharynx and oropharynx, the TVP and LVP were observed at nasopharynx, posteroinferior to the orifice of the auditory tube. The tendon of the TVP was extended to the soft palate. The LVP was situated superior and posterior to the TVP. After removal of palatopharyngeus and salpingo-pharyngeus, the SC was observed at the posterior and lateral wall of oropharynx. Oropharynx was enclosed by the SC laterally and soft palate superiorly. The main part of the SC extended laterally from the pharyngeal raphe, and attached anteriorly to the pterygoid hamulus and the pterygo-mandibular raphe…We hypothesized two additional function of the SC. First, the SC would also affect to the function of the opening and closing mechanisms of the auditory tube by supporting the TVP and LVP. Second, the SC would have the function of pulling the soft palate downward and posteriorward.

THOSE GREAT MEN AND THEIR MAGNIFICENT DISCOVERIES. A SHORT TALE ON "HISTORY OF HISTOLOGY"

Ayman M. GHALLAB

Zagazig University, Faculty of Medicine, Histology Dept, Histology, Egyp

What is an eponym? Eponym isa histological word, structure, or cell whose name is related to a scientist discovering it. In the 17th century, the subject of Histology was born after the invention of the microscope and discovery of the cell by Antonie van Leeuwenhoek and Robert Hooke in 1665. Marcello Malpighi (1628-1694) is concidered the Father of histology. His name was given to many structures. In the 18th century, Marie Francois Bichat (1771-1802) made the first definition of the tissue. He was considered the founder of histology (he described 21 textures) but without microscope.

When Napoleon Bonaparte invaded Egypt “Rosetta Stone” was discovered and the mystery of the Ancient Egyptian Heliographic alphabet was solved. After two years Bichat’s described the tissues of the body, it can be said that those manuscripts of Bichat were a kind of "Histology Rosetta Stone”. In the 19th century, Johannes Purkinje (1787-1869) was a pioneer in histological techniques, first to use something like a microtome. Theodore Schwann (1810-1882) is a German histologist and cytologist who developed the cell theory. Leopold Auerbach (1828-1897) was one of the first to use histological stains to view the nervous system. Most famous for his Auerbach’s plexus. In the 20th century, Camillo Golgi (1843-1926) known for a silver impregnation of nerve cells called the Golgi method. So eponym in Histology is really more than just a name, it’s honoring those scientists who devoted their lives to make the world a better place, it’s history behind a word.

ANATOMICAL VARIATIONS OF THE CYSTIC AND HEPATIC ARTERIES AND THEIR SURGICAL IMPLICATIONS

Ileana GIUVARASTEANU[1], Claudia STOICA[1], Nicolae BACALBASA[2]

[1]"Carol Davila" Univ. of Medicine and Pharmacy, Faculty of Medicine, Dept of Anatomy, [2]"Carol Davila" Univ. of Medicine and Pharmacy, Faculty of Medicine, Dept of Obstetrics and Gynecology, Cantacuzino Clinical Hospital, Romania

The aim of our study is to present some variations of the cystic and hepatic arteries and their importance for liver and biliary tract surgery. Methods. Results. During routine abdominal dissection of formolized cadavers we found variations in the number and course of the cystic artery: double cystic artery; cystic artery from right hepatic artery passing anterior to the common hepatic duct. In one case, our dissection revealed the following variations in the hepatic arteries: tortuous course of right hepatic artery forming a loop inside Calot’s triangle (caterpillar hump right hepatic artery), trifurcation of common hepatic artery with absence of proper hepatic artery and accessory left hepatic artery from left gastric artery. All these arterial variants have important implications in different types of biliary or hepatic surgical procedures (laparoscopic or open cholecystectomy, choledocotomy, hepatectomy, liver transplantation, hepatic artery cannulation). Accessory left hepatic artery from left gastric artery is also important during radical gastrectomy for gastric cancer. Conclusion. The surgeon must have a good knowledge of the variations in the cystic and hepatic arteries and must choose the most appropriate surgical approach for each of them in order to avoid intraoperative vascular injuries which may lead to important postoperative hepatobiliary complications.

THE ANTERIOR NUCLEUS OF THALAMUS, THE LIMBIC SYSTEM AND DBS FOR Epilepsy

Antonio J. C. GONÇALVES-FERREIRA[1], Alexandre RAINHA CAMPOS[1], Lia LUCAS NETO[1], Ana FRANCO[2], SaraFERREIRA[3], Alexandre ANDRADE[3]

[1]Faculty of Medicine, Univ. of Lisbon, Institute of Anatomy, [2]Fac. of Medicine, Lisbon Univ., Dept of Neurology, [3]Lisbon Univ., Instituto Biofísica e Engenharia Biomédica, Portugal

Introduction and Objectives: The Anterior Nucleus of Thalamus (ANT) is one of the main thalamic nuclei and a key component of the limbic circuitry. It became recently one of the targets of Deep Brain Stimulation (DBS) for the treatment of refractory epilepsy when there is no focal resectable origin, namely in cases of limbic epilepsy. The first multicentric prospective study regarding this procedure was published in 2010, in USA. There is now an European open observational study running in several countries focused on the bilateral accurate targeting of the ANT-DBS to treat such epilepsy. These clinical studies led us to review the main anatomical structures of the human limbic system and the connections of the ANT within it; and to correlate the ANT-DBS targeting with its therapeutic results in our neurosurgical center. Material and Methods: We have treated until now 12 cases of adult refractory epilepsy by bilateral ANT-DBS. The focal origin of the epilepsy, the main clinical features, the DBS results and the 3-D references of the ANT targets are presented and discussed. Simultaneously an anatomical 3-D study was started in order to improve the correct ANT stereotactic references. Results and Discussion: The majority of our epileptic patients had a favourable clinical evolution with ANT-DBS. The epilepsy results as well as the adverse effects are presented in detail and related to the ANT targeting we used.

COMPARISON OF ULTRASONOGRAPHY AND DORSAL HORIZON VIEW TO DETECT DORSAL SCREW PENETRATIONS

Yusuf GURBUZ[1], Hüseyin GÜNAY[2], OkanBILGE[3], Levent KÜÇÜK[2], Tahir S. SÜĞÜN[1], Kemal ÖZAKSAR[1]

[1]Hand Microsurgery Orthopedics and Traumatology Hospital (EMOT), [2]Ege Univ. Medical Faculty, Orthopedics and Traumatology, [3]Ege Univ. Medical Faculty, Anatomy, Turkey

One of the most prevalent complications of volar locking plates is dorsal screw penetration… The aim of this study is to compare the efficiency of dorsal tangential fluoroscopy and Ultrasonography (USG) on determination of dorsal screw penetration. Ten light embalmed (Modified Larsen Solution) cadaver’s upper extremities…were used for this study. The plates were placed parallel to the longitudinal axis and correct to the styloid process of radius by screwing firstly the proximal one and after the distal screws…All procedures were performed by two hand surgeons with the guidance of an experienced anatomist. Radiographs were evaluated by two ’control’ orthopedic surgeons. USG evaluation was separately made by one radiologist and one board-certified orthopedic surgeon ignorant of the procedure. Both DTFDHV and USG assessments were noted by the participants whether the tip of the screw penetrated the dorsal cortex for each compartment of each model. Inter observer consistency was stated using the Pearson correlation test. Comparisons between the DTFDHV and USG evaluations were assessed using the Mann-Whitney U-test. P values were declared statistically significant at .05 or less. Inter observer consistencies were stated in DHV group as $p<0.01$, while in USG group $p<0.05$. No significant difference was observed on correct detection of 0 mm, 1 mm and 2 mm screw penetrations at second and third compartments with 0 mm and 2 mm penetrations at fourth compartment between DHV and USG groups… In conclusion USG is a reliable and usable procedure for detection of dorsal screw penetrations.

E-BOOKS OF TOPOGRAPHIC ANATOMY

Petr HAJEK

Charles University, Faculty of Medicine in Hradec Kralove, Department of Anatomy, Czech Republic

With respect to modern form of education, we publish four electronic books of topographic anatomy. The first one (ready to use in the time of ISCAA meeting) is Topographic Anatomy of the Upper Limb. Series of the following parts of the human body are in progress. The books are based on our E-learning courses of topographic anatomy running in LMS Moodle almost one decade. Back then we found out that time stress made students to focus on systematic anatomy and to sidetrack the topographical anatomy. For this reason, the courses were supposed to complete current contents of practical classes suitably and to clear blind spots not only in syllabi, but also in motivation of students. Moodle courses were joined with a forum, questionings, and other feedback elements which made us to modify the source. The product is a result of author’s work, students’ team, and software development company “Code Creator”. Each chapter of the book contains a study material (text, interactive pictures, schemes, photos of our dissection specimens, videos) and it is concluded by a quiz as a feedback. All the texts are original works based on knowledge of literature and also experience from own dissection works. The texts are clearly structured by bullets, anatomic terms are highlighted. Interactive pictures

come from students' illustrations. The project is supported by the Charles University, IP 2016-2018

INTRASPINAL INTRADURAL ANOMALIES (CLINICO-ANATOMICAL RESEARCH ON SPINAL NERVE ROOTS)

Zora HAVIAROVA, Viktor MATEJČÍK
Comenius University, Faculty of Medicine, Slovakia

Variability in certain dimensions, form, structure and position is natural for the human body and internal organs, is accepted as natural variability….About 10% of misdiagnoses are based on ignorance of the anatomical variability. New and newer imaging methods- echography, endoscopy, CT, MRI- have opened space for the research of anatomical variations. Our work is focused on the intraspinal intradural anomalies of the peripheral nervous system… Peripheral nerve lesions differ from all other injuries by their clinical course and results, which are largely determined by complexity of the degeneration and regeneration processes. The anatomical study was performed on 33 cadavers within 24 hours after their (usually violent) death: 27 males and 6 females. Each body was dissected in a prone position, The wide and long laminectomy (from the cervico-cranial transition to the sacrum) revealed the full spinal canal for the examinations of each cervical, thoracic, lumbar and sacral nerve roots from their origin to their exit through the intervertebral foramina and sacral hiatus….Subsequently the long incision of the spinal dura mater was made in order to allow the visualization of spinal nerve roots and conus medullaris… More distally their number was increased, especially among the sacral roots. In our works, we have repeatedly pointed to the importance of the individual approach in the analysis of the course and treatment results of the peripheral nerve injurie...Obtained observations may be helpful in explaining the differences between the clinical picture and generally accepted anatomical standards.

CASE RIPORT OF BILATERAL SUPERNUMERARY RENAL ARTERIES

Tibor HOLLÓSY, Judit HORVÁTH, Dóra REGLŐDI, Pál TÓTH
Anatomy Dept, Medical Faculty, University of Pécs, Hungary

The development of the kidney and its vessels is a complex process and – accordingly – its anatomy and blood supply are of high complexity. Due to the delicacy of the development, several malformations may occur…These vascular variations are of equally high importance both in renal surgery and renal transplantation. The kidneys develop in the caudal (pelvic) region, later shift to more cranial position…During their ascent, they are supplied by continuously developing segmental arteries, originating from higher and higher levels of the abdominal aorta. Meanwhile the lower arteries degenerate, but occasionally some may persist. Accessory renal artery may occur in 30-35% of the population, usually on the left side. The incidence of bilateral variations is 10%, those of unilateral ones is 21%. The rate of occurrence of more than one accessory renal arteries is 6-8%. In our case (90 years old man, with no renal disease in the case history), we found four renal arteries on the left side, the highest representing the normal anatomical position. On the right side there was one supernumerary renal artery. Each artery was accompanied by the corresponding renal vein. Moreover, the left hilum was shifted to the ventral surface of the kidney, and quite a big portion of the renal pelvis was excluded from the renal sinus. Since the persistent renal arteries interfered with the upward migration of the kidneys, their shape was markedly more elongated, and their lower poles were extending more inferiorly than usual.

MICROVIDS: INDICATION-BASED EXAMINATION PROTOCOLS IN MUSCULOSKELETAL ULTRASOUND

Florian A HUBER, Franz KAINBERGER, Lena HIRTLER
Medical University of Vienna, Austria

Today ultrasound is commonly used in various medical specialties. Numerous indications are visible with ultrasound, and show good sensitivity and specificity for this imaging modality. Dominated by the rapid development in US technique – such as high-frequency probes and better software image processing – the number of investigations in daily clinical practice has constantly been increasing over the last years and decades. Coming along with the invention of high-frequency ultrasound probes, musculoskeletal (MSK) radiology has become a specialty of ultrasound more and more. Despite the evidence of good specificity and sensitivity for the gross of MSK pathologies, the offer of standardized guidelines is still poor. Efforts have been made by the European Society of Musculoskeletal Radiology, which created anatomy-based guidelines for all big joints of the extremities. Apart from this fundamental paper, we weren't aware of useful guidelines with a clinical approach. Our overall-objective of this study was to develop, and at a later moment to verify and test indication-based guidelines for musculoskeletal ultrasound of the wrist. A comprehensive literature research combined with experts's opinions on the mined data resulted in the basic version of our new indication-based protocols. Implementation of multimodal reference images (frozen section, US, CT, MRI, X-ray, anatomic sketches) of standard views as well as the use of a novel, dynamic video documentation method was performed in order to guarantee the demands of high-quality guidelines.

FORAMEN OF HUSCHKE AND ITS MEASUREMENTS WITH RELATED STRUCTURES

Z. Asli A. IKIZ, Hülya ÜCERLER, Boduç ERENGÜL, Lokman ÖZTÜRK
Ege University, Medicine Faculty, Anatomy Dept, Turkey

Foramen of Huschke (also known as foramen tympanicum) is an anatomical variation in the bony part of the external auditory canal. This bony defect, which is normally closed in adults was first described by a German anatomist and embryologist. It results from the lack of temporal bone ossification and may be closed up to five years of age. The foramen of Huschke presence was analyzed in 567 temporal bones in this study. The localization of the foramen was determined relative to the wall of the external acoustic canal and mandibular fossa. The axial and sagittal diameters of each foramen were measured. The persistence of foramen of Huschke is an incidental finding in most cases and does not require treatment itself. However in some cases it may lead to complications such as herniation of temporomandibular joint, ear discharge, spread of infection or tumor from the external auditory canal to the infratemporal fossa and vice versa. If presence of this entity is not known and recognized, it may be difficult to diagnose the complications related with foramen of Huschke. Because of this reason, we believe that the detailed anatomic knowledge about foramen of Huschke will be helpful for radiologists as well as ear, nose, throat, and head & neck surgeon.

THE EFFECTS OF EARLY ENVIRONMENTAL ENRICHMENT AND PACAP ON MONOAMINE LEVELS IN AN AGING RAT MODEL OF PARKINSON'S DISEASE

Adél JÜNGLING[1], Dóra REGLŐDI[1], Gábor MAASZ[2], Zita ZRINYI[2], András CSÁSZÁR[1], Ádám RIVNYÁK[1], Dóra PETROVICS[3], Daniel B. FÜLÖP[1], Balázs GASZNER[1], István KISS[2], Zsolt PIRGER[2], Andrea TAMÁS[1]
[1]University of Pécs, Medical School, Anatomy Dept, [2]MTA ÖK BLI, Adaptive Neuroethology, MTA-CER National Brain Project, [3]University of Pécs, Dept of Biochemistry and Medical Chemistry, Hungary

The causative therapy of Parkinson's disease is still under investigation. We have previously shown the neuroprotective effects of PACAP and enriched environment in Parkinson's disease in young animals. The aim of our present study was to examine the effects of these factors in one-year-old rats after 6-OHDA-induced lesion of the substantia nigra, measuring the dopamine and serotonin levels in the brain. Wistar rats were used in our experiment (n=15). Animals were divided into standard (n=7) and enriched groups (n=8)

according to their environmental conditions. Animals of the standard group were placed under regular conditions… One year later rats were treated with unilateral injections of 2 µl 6-OHDA (5 µg/µl) into the left substantia nigra, control animals received 2 µl physiological saline. Following the 6-OHDA injections some of the standard-group-animals received 2 µl (1µg/µl) PACAP treatment. On the 7th postoperative day we measured the levels of dopamine (DA) and serotonin (5-HT) in the substantia nigra by LCMS method. Physiological saline did not cause any significant decrease in DA levels in either of the animals. The substantia nigra of the 6-OHDA-treated standard and enriched animals showed significantly lower DA levels compared to the saline-treated animals of the same groups. Consistent with our previous studies in young animals, the PACAP treatment could increase the DA levels by 15% after 6-OHDA induced lesion. No significant differences could be observed regarding the serotonin levels of the substantia nigra. Although the protective effect of early postnatal environmental enrichment is described in young animals, we could not prove it in our experiment on aging animals. However, similarly to younger animals PACAP could restore the decrease of DA levels, which could play a role in its neuroprotective effect in Parkinson's disease. Supported by: OTKA K104984, Bolyai Scholarship, PTE-MTA „Lendulet" Program, Hungarian Brain Research Program . KTIA_13_NAP-A-III/5.

FIPAT AND CURRENT STATE OF MORPHOLOGICAL NOMENCLATURES

David KACHLIK
Second Faculty of Medicine, Charles University, Department of Anatomy, Czech Republic

The Federative International Programme for Anatomical Terminology (FIPAT) is a group of experts who review, analyze and discuss the terms of the morphological structures of the human body. It was created by IFAA and succeeded the previous FICAT. It is composed of six working groups (for Gross Anatomy, Histology, Embryology, Neuroanatomy, Odontology/Anthropology, Orobiology and two subcommittees (Latin and Informatics), each headed by a coordinator and comprising several advisors coordinators (from 15 countries). The last meeting of FIPAT (September 2015) proposed to publish a new version of the Terminologia Anatomica and Embryologica and to separate the Terminologia Neuroanatomica. These proposals have been sent to member societies of IFAA for review at the end of 2015 and the final drafts will be presented to IFAA board in Goettingen in September 2016 for approval. The main issue, besides extensions and refinements, is to have only one preferred synonym in Latin, British and American English. In the document, which will be free accessible on internet, other Latin and English synonyms are listed, accompanied with eponyms. Any comment, criticism or proposal can be addressed to any member of FIPAT or via the Discussion forum of the FIPAT website.

SCALENOVERTEBRAL TRIANGLE – MYTH OR TRUTH?

David KACHLIK[1], Georg FEIGL[2]
[1]Second Faculty of Medicine, Charles University, Department of Anatomy, Czech Republic, *[2]University of Graz, Department of Anatomy, Austria*

The scalenovertebral triangle is a topographic space in the depth of the neck. From the anatomical point of view it overlaps from the anterior to the lateral cervical regions. Its borders are not defined and agreed worldwide and majority of the English-written books neglect this space. Only the lateral border by anterior scalene muscle, and caudal border by dome of the pleura are obvious. Dorsally is the space limited by longus colli muscle or if it continues into the intervertebral foramen and epidural space? Medially, is it limited by the inferior oblique part of the longus colli muscle or by the midline cervical organs (oesophagus, trachea)? Ventrally, is it the sternocleidomastoid muscle? And based on the precisely defined borders, the contents should be specified. The scalenovertebral triangle serves in clinical medicine e.g. for instillation of regional anesthesia to stellate ganglion, and that is why its precise anatomy should be defined, approved and taught by anatomists.

DISEASES OF LUXEMBOURG DYNASTY

David KACHLIK[1], Dana STEYEROVA[2]
[1]Second Fac. of Medicine, Charles Univ., Dept of Anatomy, [2]Regional Hosp. Kladno, Otorhinolaryngology, Czech Rep.

This year we celebrate 700th anniversary of the birth of the Bohemian king and Roman emperor of the Luxembourg dynasty – Charles (Karel) IV. His father, John (Jan) the Blind lost his vision probably due to glaucoma and rode to find his death to the battle of Crécy in 1346. Charles himself suffered from a complicated fall after being hit during a tournament in 1350, paralyzed with a bilateral fracture of mandible and a trauma of the cervical vertebral column. He died of pneumonia after another fall from a horse which caused a femoral neck fracture. His first son Wenceslaw (Václav) IV suffered from neural problems and died after a shock caused by beginning of Hussite revolt in 1419. His second son, Sigismund (Zikmund) died after gangrene and successive phlegmone of the great toe in 1437. The skeletons (except the lost ones of Sigismund) were studied by the Czech anthropologist Emanuel Vlček who brought after studying the historical sources these final diagnoses.

THE TRANSITIONAL MUSCLE OF EYES AND ITS COMPLEX RELATIONS WITH NEIGHBORING MUSCLES

Natnicha KAMPAN[1], Okuda ITSUKO[2], Nasu HISAYO[1], Yamaguchi KUMIKO[3], Akita KEIICHI[1]
[1]Dept of Clinical Anatomy, Tokyo Medical and Dental Univ. (TMDU), [2]Dept of Diagnostic Radiology, International Univ. of Health and Welfare, Mita Hospital, [3]Institute of Education, Tokyo Medical and Dental University (TMDU), Japan

Orbicularis oculi muscle (OOc) is one of the important facial expression muscles. Despite various studies attempted to elucidate the anatomical variations of the muscles surrounding the OOc, including the malaris muscle which is considered as the medial and lateral bundles of the OOc, this complex region has still remained unclear. Thus, the current study aimed to classify and clarify these complex muscle bundles. Fourteen hemi-faces of embalmed Japanese cadavers were dissected carefully to indicate the anatomical structures of the OOc including surrounding muscle bundles and also neighboring muscles. The medial and lateral bundles of the OOc were examined and clarified the patterns of the attachments, and also considered the relations with neighboring muscles. Medial and lateral bundles of the OOc were found in all specimens. The medial bundle was classified by the origin into four types. Type A (4 specimens, 28.6%), originated from the frontal process of maxilla (FPoM). Type B (2 specimens, 14.3%) and Type C (2 specimens, 14.3%) originated from FPoM with medial palpebral ligament (MPL), and FPoM with depressor supercilii muscle (DS), respectively. Type D (6 specimens, 42.9%), the medial bundle of malaris muscle originated from FPoM together with MPL, and also DS….These findings regard that the medial and lateral bundles of the orbicularis oculi muscle are the complex muscles having various variations and relations with neighboring muscles reciprocally. Accordingly, this significant complex muscle group should be concurrently considered for promote the efficiency in rejuvenation or cosmetic surgery.

CORNUATE TYPE ACCESSORY NAVICULAR BONE OR PROMINENT NAVICULAR TUBEROSITY?

Alev KARA
Mersin University, Faculty of Medicine, Anatomy, Turkey

Accessory navicular (AN) is one of the most common accessory bone of the foot…The aim of the study was to ensure morphometric data for navicular bone and its medial bony extension regarding to cornuate type AN. Radiographs of 77 subjects… were investigated. Widths and antero-posterior lenghts of both native navicular and its medial bony

extension were measured. The cadaver with bilateral prominent cornuate type AN was dissected to investigate the insertion site of the posterior tibial tendon. The parameters were analysed statistically in terms of sex and side differences. Paired t test was applied to evaluate the side differences. Student t test was applied to evaluate sex difference.Relation between parameters were evaluated by using pearson correlation test. In 6 sides the AN was Type 1, in 11 sides AN was type 2. In 3 sides there was a prominent bony extension at the medial side of navicular. The width and anteroposterior lenght were found significantly higher in men than in women. But there were no statistically significant difference between sexes in terms of wMP and apMP (p=0.781, p=0.058). In the cadaver presented in this study, the posterior tibial tendon inserted on the medial side of the accessory navicular superiorly. It was not extending to any other bone at the plantar surface. We suggest that there is a necessity of criteria to distinct a normal navicular tuberosity from the Type 3b AN. Descriptive data about the navicular given in the present study would help to clarify this issue.

FRIEDMAN TONGUE POSITION AND MANDIBULAR ANTHROPOMETRY

Menekse KARAHAN[1], Kayatekin A Z YILMAZERM[1], Elif YILMAZ[2], Yilmaz ALI[1]

[1]Trakya University, Anatomy, [2]Sultan I. Murat Edirne State Hospital, Dept of Anaesthesiology and Reanimation, Turkey

Objective: The preoperative anaesthesia evaluation should include an assessment of oropharynx. Difficult intubation increases with increasing tongue volume. Friedman tongue position (FTP) may play an important role in the evaluation of oropharynx. The purpose of this study is to investigate the relation of the age, sex and anathropometric measurements with friedman tongue position. Material and Methods: 96 volunteers (45 men, 51 women) who were studying at our university participated in this study. The Ramus mandible height, corpus mandible length and bigonial distance were measured. FTP was used for determined of oropharyngeal view .The scores corresponding with the position of tongue in mouth were compared with the anthropometric measurements and demographic data. Results: There were not significant corelation between FTP with Ramus mandible height, corpus mandible length and bigonial distance (p=.0,727, p=0,547, p=0,365 respectively). Conclusion: There are lots of studies indicating FTP as a marker. But there must be more other studies which search the realitionship between FTP and anthropometric measurements are needed. We convinced that; our study will set light to the awareness of this deficiency.

CUTANEOUS PERFORATORS OF THE ARM AND ANATOMIC LANDMARKS FOR DEFINING THE FLAP DONOR SITES

Burak KAYA[1], Georg FEIGL[2], Serdar M. GULTAN[1], Nihal APAYDIN[3]

[1]Faculty of Medicine, Dept of Plastic and Reconstructive Surgery, Ankara University, Turkey, *[2]Medical University of Graz, Institute of Anatomy, Austria*, *[3]Ankara University, Faculty of Medicine, Department of Anatomy, Turkey*

Flaps are one of the basic methods that have been used to restore form and function in plastic and reconstructive surgery. Perforator flaps represents the ultimate point that has been reached in the flap surgery... In order to design a perforator flap, the exact location of the cutaneous perforators by the anatomic landmarks must be known. As there are only a limited number of studies… there is a need for further anatomical studies concerning on the cutaneous perforators and perforator flap donor sites of the arm. Fourteen Thiel fixed cadaver upper extremities and 6 light embalmed cadavers were used. The location of cutaneous perforators was determined by using easily palpable anatomic bony landmarks including acromion, medial epicondyle (ME) and lateral epicondyle (LE). The LE and ME were connected by a horizontal line. The distance between the midpoint of this line and to acromion was measured while the arm is in abduction position. The source artery (brachial artery and its branches) of these perforator arteries were found and the length and diameter of the source artery and the potential flap donor sites on the arm were determined in relation to the defined lines…According to the results of our study the ideal location of the flaps on the medial side is more commonly found within 5.6-8.4 cm on the Y axis and 2.4-4.2 on the X axis and on the lateral side within 2.6-4.5 cm on the Y axis and 0.8-2.2 on the x axis….

A CADAVERIC STUDY ON THE SAFETY OF RETROGRADE DRILLING OF THE TALAR OSTEOCHONDRAL LESIONS

Mert KESKINBORA[1], Bilgehan CATAL[1], Gamze KIRIKCI[2], Nedret K ELIF[2]

[1]Istanbul Medipol University, Ortopaedics and Traumatology, [2]Acibadem University, Anatomy, Turkey

Osteochondral lesions of the talus affect the talar dome cartilage and subchondral bone. These lesions were often related to traumatic ankle injuries and usually takes place in the posteromedial corner of the talar dome…The aim of this study was to reveal the anatomical structures at risk during a standard retrograde drilling procedure for an osteochondral lesion of medial talar dome under fluoroscopic control and to define an anatomically safe area for application. Eighteen fresh-frozen ankle (10 right and 8 left) specimens from 14 male and 4 female cadavers were used for this study…For posterolateral entrance a 3-mm longitudinal incision was made through the skin just lateral to the Achilles tendon. Blunt dissection was performed to expose the posterolateral corner of talus. First a Kirschner wire (K-wire) 1.2 mm in diameter was inserted from the entrance points. Antero-posterior (AP) and lateral fluoroscopic images of the ankle were obtained to figüre out what direction to insert the guide wire. Then the K-wire was advanced toward the estimated posteromedial lesion side without penetrating the chondral layer. After ensuring the accurate wire position under fluoroscopic control, a cannulated drill 2.5 mm in diameter was advanced until the tough subchondral bone felt… In 4 specimens (22%) a damage to sural nerve and in another 4 specimen (22%) damage to ATFL were documented…If not necessary, retrograde drilling via posterolateral approach have to be avoided, in order to protect the sural nerve from the potential high risk of damage.

VISUAL RATING OF HIPPOCAMPAL ATROPHY ON STRUCTURAL MRI FOR DIAGNOSIS OF ALZHEIMER'S DISEASE

Karel KIESLICH[1], Jana MRZILKOVA[1], Ales BARTOS[2], Milan JANOUSEK[2], Ibrahim IBRAHIM[3], Zdenek WURST[1], Barbora KUCHTOVA[1], Vladimir MUSIL[4], Matej PATZELT[1], Jitka RIEDLOVA[1], Petr ZACH[1]

[1]Third Faculty of Medicine Charles Univ. in Prague, Dept of Anatomy, [2]National Inst. of Mental Health, Dept of Cognitive Disorders, [3]Institute for Clinical and Experimental Medicine, Radiodiagnostic and Interventional Radiology Dept, [4]Third Faculty of Medicine, Charles Univ., Centre of Scientific Information, Czech Republic

Diagnosis of Alzheimer's disease (AD) and mild cognitive impairment (MCI) relies largely on cognitive and behavioral symptoms. Although atrophy of the hippocampus on structural MRI as a biomarker of AD may aid the clinical diagnosis, it is seldom used in clinical practice because the quantification of hippocampal volumes requires special expertise and normative values have not been established. We propose a visual rating of hippocampal atrophy usable in routine clinical practice and aim to assess its reliability and preliminarily also its validity…on a single coronal MRI slice (optimal slice – OS) as a ratio of the hippocampus size to the size of the adjacent temporal horn of lateral ventricle (HHR)… A series of MRI studies from 207 subjects who had been diagnosed as having AD (95), MCI (26) or being cognitively normal (86) were used…Statistical analysis of their

agreement and agreement with the neuroanatomist was done by Bland-Altman plot, and the area under the receiver operator curve (aROC) was calculated for the ability of HHR to correctly classify subjects. Results In Bland-Altman plot, the mean difference between the neuroanatomist and the participants in determining the OS was -0.18 slices (limits of agreement: ±2.72), which is not a clinically significant difference for the subsequent assessment of HHR. The mean difference between the neuroanatomist and the visual rating done by the participants in determining the HHR was 2.23% (limits of agreement: ±5.72%). We suggest that visual rating of hippocampal atrophy is equivalent to morphometric analysis, can be performed with minimal amount of training, and correctly classifies AD and MCI patients (even though cut-off scores must be determined by thorough clinical analysis with regard to the desired sensitivity and specificity). Therefore, it could be used to support the diagnosis of AD and MCI in clinical practice.

IMMUNOHISTOCHEMICAL BEHAVIOR OF ESTROGEN RECEPTORS IN HIPPOCAMPUS OF RATS ADMINISTRATED BY CILOSTAZOL

Gamze KIRIKCI[1], Elif N KESKINOZ[1], R. İrem ALPARSLAN[2], Mustafa AKTEKIN[3]

[1]Medical Fac., Anatomy, [2]Acibadem Univ., Vocational Sch. of Health Services, [3]Acibadem Univ., Dept of Anatomy, Turkey

Estrogen plays an important role in…the regulation ofplasticity, growth and differentiation of axons and dendrites. Estrogen receptors (ER)are abundant in the hippocampus. Evidence suggests that membrane localized classical ER mediate the consolidation of memory…Cilostazol (CLZ, Pletal®) a phosphodiesterase 3A (PDE3A) inhibitor enhance memory and cognitive functions within the central nervous system. PDE3A is expressed in frontal cortex, hypothalamus and hippocampus. In the present study the effects of CLZ on ratpyramidal neurons and granule cells of dentate gyrus (DG) of rat hippocampus were studied. Female Sprague Dawley rats (12weeks old) subdivided into controls (group I)not receiving CLZ and experimental group (group II), (n=6 in each group) receiving CLZ (20mg/kg, p.o.) by intraperitoneal injections for 28 days… Brain sections were processed for hematoxylin eosin and immnunohistochemistry to quantify morphological and morphometric parameters. Using an antibody of ER, we reported that increased expression of ER in different subfields of CA as well as in DG, in the control group while decreased expression of estrogen receptors was observed in hippocampus administrated by Cilostazol. Comparing the control group with the experimental group hippocampus showed great vacuolations, disorganization and shrinkage of the pyramidal cells. In the control group, there is increased degeneration inside the hippocampal sulcus also multiple vacuolations especially in dentate gyrus area. The thickness of CA3 was reduced in the experimental group compared with control group. Moreover, immunohisto-chemical results for ER stained sections revealed had a reaction in astrocytes in the control group. According to this result, on the contrary to the previous studies...

BODY PAINTING: INCREASING PUBLIC ENGAGEMENT IN POPULAR ANATOMY EDUCATION

Karen S KIRKNESS

3D Printworks, United Kingdom

Body painting has become a mainstream teaching tool in anatomy education. As an innovative learning technique in academic lesson plans, body painting augments traditional dissection practices as a practical means of synthesising anatomical concepts learned through dissecting cadaveric material. As PG McMenamin has written, "The kinesthetic nature and active participation together with the powerful visual images of underlying anatomy appear to contribute to the value of body painting as a teaching exercise." Due to the expensive and extremely resourceintensive nature of maintaining cadavers, public interest groups are limited. in their access to this material and must instead develop practical means by which to achieve their learning objectives in the subject of anatomy. In this study, the author focused on the measurable effects that body painting had on the achievement of learning objectives in nonacademic groups aiming to learn basic human anatomy concepts. The author has reviewed the literature on the use and testing of body painting as an engaging and effective teaching tool. In their publication, Body painting to promote selfactive learning of hand anatomy for preclinical medical students, Jariyapong et al report that "Students agreed that the exercise was advantageous and helped facilitate selfactive learning after inclass anatomy lessons." Positive responses such as these are pervasive in the literature published within anatomy education. In this project, the author has used body painting in the private sector in public engagement events centred on popular understanding of human anatomy. Participants were questioned on their perceived level of understanding of anatomical concepts …

PHILOSOPHY OF TEACHING THE HEAD AND NECK ANATOMY FOR MEDICAL AND DENTAL STUDENTS

Darina KLUCHOVÁ[1], Květuše LOVÁSOVÁ[1], Jaroslav MAJERNÍK[2]

[1]Dept of Anatomy, Faculty of Medicine, P. J. Safarik Univ. in Kosice. [2]P.J. Šafárik University in Košice, Dept of Medical Informatics. Slovakia

The head and neck region is structurally complicated area of human body. It is one of the most difficult part for studying anatomy both for medical and dental students. It is clear that knowledge of the head and neck anatomy is the essential for dental students but it should be learned by medical students as well. In the past, dental students were taught in a shared program, so that the same teaching time and teaching methods were used for both types of students. Recently, more anatomists are of the opinion that in anatomy, dental students are best taught separately from medical students in a dental gross anatomy course, where greater emphasis is given to head and neck anatomy. Our aim is to compare the amount of knowledge to be learned in head and neck region necessary for medical / dental students. The place of head and neck anatomy, curriculum structure, the role and importance of this teaching was considered in all types of medical students. The curricula of different schools show various opinions on teaching of head and neck region for medical and dental students. The approaches to using of educational tools are mostly identical for both groups of students (using prosections in the dissecting room, types of lectures, using models and handouts, developing of 3-D anatomical knowledge, etc.), but the most discussed part of teaching this region is the using of appropriate books which would cover the core material. Funded by grants: KEGA 005UPJŠ-4/2016 and KEGA 017UPJŠ-4/2016

THE INGUINAL REGION REVISITED – THE SURGICAL POINT OF VIEW - AN ANATOMIC - SURGICAL MAPPING WITH REGARD TO POSTOPERATIVE CHRONIC GROIN PAIN FOLLOWING OPEN HERNIA REPAIR

Marko KONSCHAKE[1], Marit ZWIERZINA[2], Bernhard MORIGGL[1], René FORTELNY[3], Reinhard FÜGGER[4], Franz MAYER[5], Thomas SCHMID[6]

[1]Dept of Anatomy, Histology and Embrology, Division of Clinical and Funcional Anatomy, [2]Dept of Surgery, University Hosp. for Plastic, Reconstructive & Aesthetic Surgery, [3]Dept of General-, Visceral and Oncological Surgery, Wilhelminenspital, [4]Dept of Surgery, Elisabethinen Hosp., [5]Dept of Surgery, Paracelsus Medical Univ., [6]Dept of Surgery, University Hosp.for Visceral, Transplant and Thoracic Surgery, Austria

Background Inguinodynia or chronic post-herniorrhaphy pain, defined as pain lasting longer than 3 months after inguinal hernia repair, has become the most important complication after open inguinal hernia repair and therefore comprises the patient´s quality of life. The lack of exact knowledge and understanding of the neuroanatomy of the inguinal region,

might be the major reason for long term postoperative pain. Besides, the treatment of the nerves during operation remains unclear. Methods A clear and understandable anatomic mapping of the inguinal region and the spermatic cord sheaths by means of anatomic specimens and surgical cases is presented. Step-by-step documentation of surgical layers, their relationship to the most important anatomic landmarks and all three inguinal nerves (iliohypogastric nerve [IHN], ilioinguinal nerve [IIN], genital branch of the genitofemoral nerve [GBGFN]) are provided. Results The anterior superior iliac spine (ASIS), pubic tubercle (PT), Camper´s fascia, external oblique aponeurosis, superficial inguinal ring (SIR), external spermatic fascia, cremasteric fascia with cremaster muscle fibers, internal spermatic fascia, cremasteric vein (CV) (=external spermatic vein="blue line"), ductus deferens (DD), pampiniform plexus (PP) and the inferior epigastric artery (IEA) are the main surgical landmarks for an open inguinal hernia repair. Conclusion An exact and well-understood knowledge of the inguinal anatomy is an indispensable basic requirement for all surgeons to perform open inguinal hernia repair without complications especially as postoperative inguinodynia.

ENHANCING WRITING SKILLS BY USING PEER-MARKING IN ANATOMY JOURNAL CLUB ABSTRACT WRITING EXERCISES

Sanet H KOTZÉ., Elsje-Márie GELDENHUYS
Stellenbosch University, Anatomy and Histology, Biomedical Sciences, South Africa

Research has shown that the writing of article abstracts presented at journal clubs is an innovative way to improve students' writing skills while enhancing their critical appraisal abilities. Furthermore, peer evaluation was shown to promote confidence, excellence, student involvement and skills. As these are all qualities needed for future researchers, the writing of abstracts of journal club articles presented by a group of honours students (n=9) in medical anatomy and histology, followed by peer- marking, was recently made compulsory. Students received an article via email six days prior to the weekly journal club activity. Students in the group took turns in choosing and presenting the articles as their research interests and topics varied. Each student had to read the article in depth and subsequently write their own abstract in the conventional format but without referring to the actual article abstract. These student abstracts were sent to the journal club facilitator who allocated an abstract to each student for peer-marking three days prior to the meeting. Students were blinded as to whose abstract they were marking. After peer-marking, the abstracts were returned to the facilitator who monitored the changes and redistributed back to the original students. Common mistakes were discussed by the facilitator during the meeting. Thirty six journal club meetings were carried out using this system in 2015. Overall, an improvement was observed as the necessity for corrections and comments decreased as the year progressed. Abstract writing together with peer-marking improved the writing skills and confidence in students.

ANATOMIC VISUALIZATION OF A STERNOCLAVICULAR JOINT – NEW MRI EXAMINATION PROTOCOL USING SPINE COIL

Artur KUSAK[1], Dariusz KUSAK[2], Michał PODGÓRSKI[3], Piotr GRZELAK[4]
[1]Polish Mother's Memorial Hosp. Research Institute, Dept of Diagnostic Imaging, [2]Medical Centers the Medici, [3]Medical Univ. of Lodz, [4]Medical University of Lodz, Dept of Radiology and Diagnostic Imaging, Poland

Sternoclavicular joint injuries are uncommon, thus create a diagnostic challenge. They are diagnosed usually by means of the MRI examination. Aim of this study was to develop a new examination protocol that will allow for full morphological assessment of a sternoclavicular joint. We designed a new MRI protocol for examination of a sternoclaviculr joint, with application of a standard multichannel Total Spine Coil. Then it was compared with standard protocols. Twenty one healthy volunteers (10 women and 11 men) with average age of 25 years old, were randomized into 3 groups and examined in 3 different MRI installations (Philips Eclipse 1.5 T; Philips Inginia 1.5T; Phlips Achiva 3.0T). Every patient was examined twice – according to the standard protocol, with application of Torso/Body Coil, and according to the proposed protocol with a Spine Coil. Standard sequences were used – TSE – T1W, T2W, PD, PD FatSat in axial, coronal and sagittal plane. Within each group the following parameters were compared: signal to noise ratio, spatial resolution, intensity of motion artefacts. Study protocol was approved by the local bioethics comity and all participants signed an informed consent….Proposed protocol allows for full morphological visualisation of the sternoclavicular joint. Moreover it provides more raliable information than standards protocol. It can be applied in future anatomical studies as well as in clinical practice.

MORPHOLOGIC CHARACTERISTICS OF THE VOLAR SURFACE OF THE DISTAL RADIUS IN KOREAN

Dai-Soon KWAK[1], Ho-Jung CHO[1], In-Beom KIM[1], Joo-Yup LEE[2]
[1]The Catholic University of Korea, Catholic Institute for Applied Anatomy, [2]The Catholic University of Korea, Department of Orthopaedics, South Korea

Volar locking plate has been commonly used for treatment of distal radius fractures…The purpose of this study was to evaluate the morphologic characteristics of the volar surface of the distal radius and to provide useful information to prevent implant-related complications after volar locking plate fixation for distal radius fractures. Morphologic characteristics of the volar surface of the distal radius were evaluated with 3D computed tomography images from cadavers. Ninety specimens (male:34, female:56) were included in this study. …We also analyzed whether the volar slope angle would differ between male and female specimens. The volar slope angles of currently available volar locking plates were measured by using a 3D digitizer (Microscribe MX, Reware Inc., NC, USA) three times to obtain an average value. The measurements were obtained in each column of plates. Mean volar slope angle was 23.9±7.2 degrees in radial column and 28.1±7.6 degrees in intermediate column. Mean volar slope angle in radial column was significantly larger in male specimens compared to those of female specimens (26.1±6.6 degrees versus 20.5±6.8 degrees, $p<0.001$)…Width of the distal radius positively correlated with the volar slope angle in radial column ($r=0.323$, $p=0.003$). However, it did not correlate with the volar slope angle in intermediate column ($p=0.101$) According to our measurement of distal radius in Korean populations, larger plates need to have more volar slope angle to accommodate the morphology of the distal radius and some plates protrude from the female distal radius which may cause flexor tendon complications. …

THE DIFFERENCE OF REGIONAL BONE STRENGTH IN CERVICAL VERTEBRA: FIND A TRAJECTORY FOR FREEHAND TECHNIQUE OF PEDICLE SCREW FIXATION

Dai-Soon KWAK[1], Ho-Jung CHO[1], In-Beom KIM[1], Moon-Kyu KIM[2]
[1]The Catholic University of Korea, Catholic Institute for Applied Anatomy, [2]Gangneung Asan Hospital, University of Ulsan, Department of Neurosurgery, South Korea

Aim Pedicle screw fixation in cervical vertebra has biomechanical advantages, but it was considered very risky due to neurovascular complications. Thus, a lot of anatomical studies were conducted and concentrated on the entry point, convergent angle of cervical pedicle, trajectory or mis-placement rate. However, the anatomical study has still limitations about the individual shape difference of the vertebra. The freehand technique for cervical pedicle screw fixation was a method to complement these limitations. For performing a safety freehand technique, the strength of bone at the cortical wall of the spinal canal (adjacent of the lateral

mass), the medial and the lateral wall of pedicle have to be quantified to lead the probe. In this study, we evaluated the regional bone quality and strength in cervical vertebra for safety guidance on freehand technique. Methods In this study, we used 35 patients' data (female: 19, male: 16, mean age: 64) of the cervical CT and 2 cadavers (20 pedicle). The Hounsfield unit (HU) numbers in the vertebral canal (cHU), the medial (mHU) and lateral (lHU) wall of pedicle were measured on the axial CT images in the middle of pedicle from C3 to C7. Then, we evaluated the difference of the HU number among these regions. For comparison HU number with real bone strength, we performed the penetration test of the same region with measurement area of HU number using cadaver. The micro-indenter tip and universal test machine were used for penetration test. As the penetration test, we got the penetration load...

WHITE MATTER DISSECTION: A RENEWED ROLE IN MODERN NEUROSCIENCE

Francesco LATINI[1], Mats HJORTBERG[2], Håkan ALDSKOGIUS[3], Mats RYTTLEFORS[1]
[1]Uppsala University, Dpt. of Neuroscience, Section of Neurosurgery, [2]Uppsala University, Dept of Medical Cell Biology,, Education, [3]Uppsala University, Dept of Neuroscience, Regenerative neurobiology, Sweden

Background: The Klingler's method for white matter dissection revolutionized the study of deep cerebral anatomy. Although this technique made white matter dissection more feasible and widely used, it still presents some intrinsic limitations that can affect both modern research in neuroanatomy and neurosurgical training. New method. We evaluated the quality of different methods for specimen preparation based on an intra-carotidal formalin perfusion fixation process. Twenty post-mortem human hemispheres were prepared with this method and dissected in a stepwise manner. The pia mater, arachnoid membrane and vascular structures were then carefully removed under microscopic magnification and the hemispheres were frozen at -15 °C–20 °C for 6–10 days, then slowly defrosted for 12 hours. Results. The homogeneous and rapid fixation of the brain allowed documentation of several fine additional anatomical details. Intra-cortical white matter terminations were described during the first stage of dissection on each specimen. No limitations were encountered during dissection of the major associative bundles. On the contrary, the quality of the fixation of the specimens made it possible to isolate them en bloc. Some of the most complex and deep bundles (accumbo-frontal fasciculus and Lingual-amigdale bundle) were dissected without technical limitations. Deep vascular structures were very well preserved and dissected within the white matter until their sub-millimetric terminations. Comparison with Existing Method. Short time for preparation, a more homogeneous fixation, no technical limitation for a detailed description of superficial and deep white matter anatomy, the possibility to dissect with a single technique the fibre organization and the white matter vascular architecture are the advantages reported with the perfusion fixation. Conclusion. These results provide encouraging data about the possibility to use a perfusion fixation process, which may help in improving the quality of white matter dissection for research, didactic purposes and surgical training.

ANATOMY OF THE HEART, IT CHAMBERS AND SEPTUMS AT THE PERSON FETUSES OF 16-22 WEEKS OF DEVELOPMENT

Diana LIASHCHENKO
Orenburg State Medical Univ, Human Anatomy Dept, Russia

Nursing of premature newborns with extremely low body weight is carried out last years. Besides the fetal surgery actively is developed. Therefore the purpose of this research is an obtaining new data on fetal anatomy of heart, it chambers and septums at the person fetuses of 16-22 weeks of development. In 16-22 weeks growth of heart goes mainly to length which value increases by 57%…Heart chambers for 16-22 weeks of development grow unevenly and multi-directional. The right atrium at a fetus on this term of development is created by final departments of the superior and inferior cava veins, in its cavity there is distinctly expressed valve of the inferior cava vein. The left atrium unlike right has a well-developed cavity…The prevalence of the left ventricle length (16,76±1,1mm) over length of right ventricle (13,15±0,9mm) at 22 weeks fetuses attracts attention with the identical thickness of their wall on this term of development (2,99±0,46mm at the left and 3,03±0,49mm on the right). The thickness of the interatrial septum changes most intensively in the intermediate fetal period: rate of a gain of this parameter has made 80%, thickness in 16-17 weeks was equal in absolute values 0,54±0,07mm whereas in 22 weeks – 0,97±0,14mm. Studying of the interventricular septum of heart has shown that throughout the considered ontogenesis period both the septum length and its thickness evenly increase. Such parameter as length increases with 10,59±1,85mm in 16-17 weeks to 15,32±2,28mm in 22 weeks at rate of a gain of 45%.

ANATOMICAL EVALUATION OF THE MIDDLE PART OF EXTERNAL CRANIAL BASE FROM LATERAL APPROACH

Květuše LOVÁSOVÁ[1], Darina KLUCHOVÁ[1], Jaroslav MAJERNÍK[2]
[1]Pavol Jozef Šafárik Univ. in Košice, Faculty of Medicine, Dept of Anatomy, [2]Pavol Jozef Šafárik Univ. in Košice, Faculty of Medicine, Dept of Medical Informatics, Slovakia

Working knowledge of the skull base anatomy is essential for an effective surgical treatment…Cadaveric studies can contribute to the refinement of the indications for cranial surgery better delineate the relevant anatomy. The anatomical evaluation of the neurovascular structures on the middle part of the external cranial base – in the areas of infratemporal and pterygopalatine fossae and also around the styloid septum…The detailed pictures provide a view of the middle part of external cranial base structures until now only partially documented with associated anatomical areas nearby the base located. The middle part of external cranial base is the region containing the branches of cranial nerves controlling chewing and facial sensation, very delicate autonomic structures (as greater, lesser, and deep petrosal nerves, sympathetic and parasympathetic ganglia with branches) that control many vital functions of head and neck. It houses also the maxillary artery with branches, parts of internal and external carotid arteries, venous plexuses etc. Conclusion: This study focused on the detailed display rarely prepared structures in the area of middle part of external cranial base provides relevant photo documentation and an improvement in human anatomy teaching. It also confirms that cadaver dissection is an excellent opportunity for the integration of anatomy and clinical medicine into the clinical training of undergraduate dental and medical students. This work was funded by grants KEGA 005UPJŠ-4/2016 and KEGA 017UPJŠ-4/2016.

ANATOMY OF THE LIMBIC SYSTEM: MRI AND TRACTOGRAPHY, KLINGLER'S FIBER DISSECTION TECHNIQUE AND PLASTINATION. CREATING 3-D MODELS FOR NEUROANATOMY TEACHING

Lia LUCAS NETO[1,2], João CAVACO[1], Maria Eduarda NEVES[1], Tiago GASPAR[1], AlexandreCAMPOS[1,3], Edson OLIVEIRA[1,3], Pedro HENRIQUES[1], Antonio GONÇALVES FERREIRA[1,3]
[1]Anatomy Dept, Lisbon Medical School, [2]Neuroradiology Dept, [3]Neurosurgery Department, Portugal

The Limbic System (LS) is a complex region of the central nervous system. Previously, multiple cortical and sub-cortical connections have been added to James Papez's original "limbic circuit" (1937). However…anatomical studies using dissection techniques, which allow a better knowledge of the neurosurgical and tridimensional (3D) anatomy of this region, are unfortunately scarce. During this last year, two anatomical techniques,Klingler fiber dissection and Plastination, have been introduced…in order to create and preserve didactic

models. The Klingler fiber dissection technique is a classical procedure used in the study of the human brain white matter tracts…Current MRI techniques such as tractography and diffusion tensor imaging (DTI) represent a form of virtual dissection of the living brain….Plastination is…easily applicable to organic tissues. It allows the creation of clean, resistant and accurate anatomical models. It has been frequently used in brain slices, but seldom in the study of the brain 3D structure. Our aim was to compare the results of tractography with those of Klingler's dissection technique and to apply plastinated models in the study of Neuroanatomy. Two healthy, adult, volunteers were submitted to 3TMRI based DTI/Tractography, after informed consent. Four human brains were used forKlingler'sfiber dissection or plastination. Plastinated models were developed to allow the anatomic study of the LS through different approaches, identifying the main nuclei and association tracks, such as the hippocampus, fornix, mamillary bodies, mamilo-thalamic tract, anterior thalamic nucleus, corpus callosum and cingulate gyrus. Afterwards the models were compared with 3TMRI based DTI/Tractography images, building an asset of dynamic 3D models. Through the combination of the different used techniques, imaging and anatomical models were obtained from preserved biologic tissues…These models can be applied to the teaching of Neuroanatomy and Neurosciences.

PETROSAL SINUS ANATOMY IN THE DIAGNOSIS AND TREATMENT OF CUSHSING'S DISEASE

Lia LUCAS NETO[1,2], Ana GOMES[3], Gonçalo BASÍLIO[2], Mário MASCARENHAS[3], Jorge CAMPOS[2]

[1]Anatomy Dept - Lisbon Medical School, [2]Neuroradiology Dept, [3]Serviço de Endocrinologia, Diabetes e Metabolismo, Hospital de Santa Maria, CHLN – EPE, Portugal

Cushing's disease (CD) is responsible for 80% of endogenous Cushing's syndrome (CS)… Bilateral inferior petrosal sinus sampling (IPSS) has the highest diagnostic accuracy in this evaluation because it reflects the hormonal composition of the pituitary venous effluent. The IPS presents a high anatomical variability, often considered relevant to the interpretation of sampling results. The aim of this study was to describe the anatomy of the IPS, to determine the accuracy of bilateral IPSS in the differential diagnosis of ACTH-dependent CS and to predict adenoma lateralization in CD. Retrospective analysis of the angiographic anatomy of 14 consecutive patients with ACTH-dependent CS, subjected to bilateral IPSS between 2005-2016. Classification of the anatomy of the IPS in 4 types according to Shiu et al. Measurement of ACTH levels from both IPS and peripheral blood before and after corticotropin-releasing-hormone administration. Central-to-peripheral and interpetrosal ratio ACTH levels calculation. Of the 14 patients 64,3 % had IPS Type I , 24,1% had IPS Type 2 and 14,3% had IPS type III. None of the patients had IPS type IV. IPSS was suggestive of CD in 12 patients, ectopic CS in one patient and inconclusive in another one. ACTH lateralization was found in 10 patients…Anatomical assymmetry and variability of IPS did not impact negatively in the study of adenoma lateralization. IPSS is effective in the differential diagnosis of ACTH-dependent CS and useful in planning CD surgical therapy. Petrosal sinus anatomy variability is not detrimental to lateralization studies.

ANATOMY AND PATHOLOGICAL ANATOMY OF PERIODONTIUM DEPENDING ON THE STATE OF ORAL HEALTH OF PATIENT

Maria MATUSEVSKA[1], Eva KOVALOVA[1], Květuše LOVÁSOVÁ[2], Jana FERKOVÁ[3], Mirela ROZPRÁVKOVÁ[4], Darina KLUCHOVÁ[2]

[1]Dental Clinic HYG - DENT, Slovakia, [2]Dept of Anatomy, Fac of Medicine, Univ. of Pavol Jozef Šafárik, Slovakia, [3]Dental Clinic DENT - PREV, Slovakia, [4]Dept of Orthodontics, Clinic of Dentistry, Palacky University, Czech Republic

The periodontium is a set of tissues which keep the tooth in its socket and isolate the internal environment of the organism from the external. The periodontal tissues belong cementum, alveolar bone, superior alveolar ligaments, intra-alveolar ligaments and gingivae. Healthy periodontium is the most dependent on the daily care, its cells and tissues are preventing the entry of bacteria and their toxins into the organism. The damage of periodontal tissue is the most common after the affection by the microbial plaque, where exist bacteria. The main aim is to investigate and describe method of treatment with teeth of periodontitis. Methods. The teeth with periodontitis were tested by clinically, and radiographicaly. We prepared a treatment plan for patient with periodontitis (root treatment). The pacient was instructed about dental hygiene. Subsequently, the motivated and trained. Results. Consequence of the inflammatory process results caused by microbial biofilm progresses into dissolving of the junctional epithelium, periodontal ligaments and the alveolar bone and to necrotic changes on the cementum tooth root. We were able to influence the inflammation of the periodontium by appropriate treatment. Detection of changes in the anatomy of periodontal is depending on the state of oral health too. Conclusion. Periodontal status depends on the quality of treating and patient's compliance in the implementation of oral hygiene. Based on their knowledge, we can positively influence therapy of periodontitis. There is also a need for cooperation between the attending dentist and dental hygienist. This work was supported by the grant KEGA 005UPJŠ-4/2016

CAN BE USED ALFA-SYNUCLEIN IN COLONIC LAMINA PROPRIA MUCOSAE AS A BIOMARKER OF PARKINSONS´ DISEASE?

Eva MECHIROVA[1], Zuzana GDOVINOVA[2], Matej ŠKORVANEK[2]

[1]Medical Faculty of P. J. Šafárik Univ., Dept of Histology and Embryology, [2]Medical Faculty of P. J. Šafarik Univ. and L. Pasteur University Hospital, Dept of Neurology, Slovakia

There is an urgent need for biomarkers of Parkinson's disease (PD). Routine biopsies allow the demonstration of positive alpha-synuclein pathology in the mucosa and submucosa of the large intestine from PD patients, specifically in the enteric nervous system (ENS). Interestingly, the same findings are shown in biopsies from patients with the positive screening for risk factors of PD, being proposed that this may indicate the upcoming development of the disease, and so permitting an earlier diagnosis… 32 patients at risk for development of PD were included in the study, whose mean age was 60,1±11,7 years, 15 were men (47%). In micrographs of all 4 control healthy patients we could notice the presence of some alpha-synuclein in CD68 positive cells around Lieberkühn crypts, which is a physiological sign, in the lamina propria mucosae, but clearly not in the aggregated form. In contrast, in sections from all 4 patients in the manifest stage of PD, we observed aggregates positive for alpha-synuclein in nerve fibers of the lamina propria mucosae of all 4 of the PD patients….We have also found that in 27 of the 32 positive screening patients, micrographs of the biopsies contained the same lesion as the one present in patients with the clinical disease, which is a relatively high proportion. Our results show the presence of alpha-synuclein aggregates in colonic nerve fibers and CD68-positive cell population in healthy patients at risk for developing Parkinson's disease. ...

NEURONAL DEGENERATION IN THE HIPPOCAMPUS OF THE MOUSE WITH SPONTANEOUS RECURRENT SEIZURES FOLLOWING PILOCARPINE TREATMENT

Adrienne MÁTYÁS, Ibolya TÖRÖK, Endre DOBÓ, Marietta MORVAI, András MIHÁLY

Department of Anatomy, Histology and Embriology, Faculty of Medicine, University of Szeged, Hungary

Hippocampal sclerosis (HS) is the most common brain lesion in epileptic patients. Histopathology of HS includes the loss of the excitatory pyramidal neurons (PCs) and mossy cells (MCs), partial death of inhibitory interneurons, dispersion of

granule cells (GCs) and reactive astrogliosis….However, there are animal strains which are sensitive to epileptogenesis and also present neuropathological features resembling the HS. Our aim was to prove the presence of the ongoing neuronal degeneration in the hippocampus of the NMRI mouse, following a single status epilepticus-like convulsive event. We investigated the neuronal loss and the proliferation of microglia cells in the hippocampus with quantitative immunohistochemistry. Spatial memory and learning of the experimental animals were tested in a Barnes maze….At the end of the experiments, deeply anesthetized animals were perfused transcardially with paraformaldehyde fixative, and frozen coronal sections of the brain (24 µm) were immunostained with antibodies to NeuN, NPY, calretinin (CR), parvalbumin (PV) and microglia marker (Iba1). Marked neuropathological changes were found in HS: (1) the PCs and MCs disappeared completely, as revealed by NeuN and CR immunohistochemistry; (2) the density of Iba1 immunoreactivity was significantly increased. Less serious stages of hippocampal degeneration displayed segmental loss of the PCs in the CA1 and CA3. Another standard sign of HS was the increasing density and thickness of NPY-immunoreactive band in the inner molecular layer (IML) of DG and CA3, attributed to the sprouting of the mossy fibers of GCs. The CR immunostaining in the IML decreased. The neuronal loss and the microglial proliferation were overlapping in every case, indicating the presence of the ongoing neuronal degeneration...

ANATOMICAL PATTERN OF THE ORIGINS OF THE VENTRAL BRANCHES OF THE ABDOMINAL AORTA

E. G MOHAMMED HOSAM ELDEEN., A. H ABDEL GALIL MOHAMED.

Ondokuz Mayis University, Histology and Embryology, Turkey

Pattern of the origin of the ventral branches of abdominal aorta forms the anatomical basis for abdominal and endovascular surgeries, the aim of this study was to describe the pattern of the origin of the ventral branches of abdominal aorta. The study conducted in 2010 and included 31 cadavers, all are males, in the dissection rooms of 8 universities in Khartoum, Sudan, there was no great ethnic variations, data collected using ruler and string as measurement tools, distance was measured from the centre of each vessel at its origin, the vertebral level was detected after exposing the lumbar and lower part of vertebral column and counting was started from the 5th lumbar vertebra and upwards, two check lists were performed by two different persons for the same cadaver for more accuracy. No variations were found in the origins of the ventral branches of the abdominal aorta. In about 90% of cases, the coeliac trunk originates at level of L1, the superior mesenteric artery originates at the same level L1 in all cases, as for the inferior mesenteric artery, the level of the origin is L3 in more than 80% of cases. The bifurcation of the aorta is at level of L4 in 87.1% of cases, the mean distances from the origins of the ventral branches to the aortic bifurcation are 11.9 cm for the coeliac trunk, 11.2 cm for the superior mesenteric artery and 4 cm for the inferior mesenteric artery. The mean distance between the coeliac trunk and the superior mesenteric artery is 1.2 cm, and from the superior to the inferior mesenteric arteries is 6.8 cm.

CADAVERIC AND RADIOLOGIC STUDY OF THE ANATOMICAL VARIATIONS OF THE PROSTATIC ARTERIES. A NEW CLASSIFICATION AND REVIEW OF THE LITERATURE

Celia MOYA-MARTÍN[1], Francisco J VALDERRAMA-CANALES[1], Teresa VÁZQUEZ-OSORIO[1], Julián CUESTA[2], Alfonsina FRIERA[2], Jose M GIL-VERNET[3]

[1]Complutense Univ of Madrid, Dept of Human Anatomy & Embryology, [2]Hospital Univ. de la Princesa, Interventional Radiolgy Serv., [3]Hosp. Quirón Teknon, Urology Serv.. Spain

The prostatic artery (PA) originats from the internal iliac artery (IIA). Development of prostatic arterial embolization (PAE), to treat benign prostatic hyperplasia (BPH), has raised the interest in knowing the origin patterns of the PA. This study aims to elucidate the vascular patterns of the PA, with two different samples (cadaveric and radiological), compared them with the scarce previous studies, and to propose a new, simple, and inclusive classification of PA variations… We dissected 10 male adult pelvis sides, ages ranged from 69 to 92. In addition, a retrospective analysis of 34 DSA pelvic angiographies was done…According to the new classification proposed, results were divided into types, following an approximately cranio-caudal sequence. Type I, the PA directly originates from the anterior division (AD) of the IIA, 12/58 (20.7%); type II, PA sourcing from the obturator artery (OA), 1/58 (1.7%); type III, the gluteal-pudendal trunk (GPT) gives the PA, 17/58 (29.3%); type IV, PA originating from the internal pudendal artery (IPA), 17/58 (29.3%); and type V, PA comes from the middle rectal artery (MRA), 10/58 (17.2%). Other less frequent origins, not present in our sample, but described in the literature, were consigned as type VI. Variations in the origin of PA are numerous and different to those presented in the textbooks. Although our sample is not large, our results compare well with the meta-analysis. A total sample of 575 PA has been reviewed and a new, simple, and complete classification for the origin of the PA is proposed.

TRACTOGRAPHY OF FORNIX, PARATERMINAL GYRUS AND SUBCALLOSAL GYRUS IN PACIENTS WITH ALZHEIMER'S DISEASE

Jana MRZILKOVA[1], Barbora Kuchtova[1], Jana MRZILKOVA[1], Zdenek WURST[1], Ales BARTOS[2], Ibrahim IBRAHIM[3], Karel KIESLICH[1], Jitka RIEDLOVA[1], Milan JANOUSEK[2], Vladimir MUSIL[4], Matej PATZELT[1], Petr ZACH[1]

[1]Third Fac. of Medicine Charles Univ. in Prague, Dept of Anatomy, [2]National Inst. of Mental Health, Dept of Cognitive Disorders, [3]Inst.for Clinical and Experimental Medicine, Radiodiagnostic and Interventional Radiology Dept, [4]Third Faculty of Medicine, Charles Univ., Centre of Scientific Information, Czech Republic

Aim Alzheimer's disease (AD) is neurodegenerative disease characterized by the accumulation of extracellular, insoluble beta amyloid plaques and intracytoplasmic tau-associated neurofibrillary tangles…The aim of this study was to measure parameters of fornix and gyrus subcallosus and paraterminalis in patients with AD and healthy controls of similar age. Then compare results and determine statistical differences between both groups. Patients with AD and controls were divided by a neurologist based on psychological and clinical examination. DTI scans were acquired on 3T MRI at Institute for Clinical and Experimental Medicine (IKEM). DSI Studio was used for QSDR image recontruction. The area of fornix and gyrus subcallosus and paraterminalis was drawn manually according to anatomical position in all dimensions on T2 weighted MRI images. Then tractography, visualisation of neural tracts, was created. Based on recontructed neural tracts we obtained these parameters: number of tracts, tract lenght, tract volume, quantitative anisotropy (qa) and generalised fractional anisotropy (gfa). Statistical analysis was performed using STATISTICA 12 (ANOVA test, t-test). Results We compared 24 patients with AD and 24 control patients. There was statistically significant decrease of number of tracts and tract length in the area of left fornix in patients with AD…Conclusion Fornix is associated with episodical memory which is responsible for remember of certain events and connection of time and space. Degeneration of fornix according to DTI analysis explains longterm memory loss in patients with AD. There was significant increase in parameters in area of gyrus subcallosus and paraterminalis, area associated with short term memory. A higher gfa and qa value indicate better integrity of the neural fiber bundles whichmight represent the compensation of AD. Tractography could be used for diagnosis of AD. Study was supported by project of Charles University PRVOUK P34 and P38, 260277/SVV/2016.

MORPHOLOGICAL VISUALIZATION OF THE CARDIOVASCULAR SYSTEM BY MICRO-CT

Jana MRZILKOVA[1], Matej PATZELT[1], Petr ZACH[1], Jitka RIEDLOVA[1], Zdenek WURST[1], Jan DUDAK[2,3], Jan ZEMLICKA[2], Frantisek KREJCI[2], Vladimir MUSIL[4]

[1]Third Fac. of Medicine Charles Univ. in Prague, Dept of Anatomy, [2]Czech Technical Univ. in Prague, Inst, of Experimental and Applied Physics, [3]Czech Technical Univ. in Prague, Fac. of Biomedical Engineering, [4]Third Fac. of Medicine, Charles Univ., Centre of Scientific Information. Czech Republic

Micro-CT is equipment designed to visualization of the inner tissue structures using X-ray beams. The limiting factor of soft tissue visualization is their reduced capacity of X-ray beams absorption. With the help of contrast agents it is possible to enhance quality of scanned organs or blood vessels. Another limiting factor may be the present size of the instrument detector - 3x3 cm….We experimented with ethanol concentr-ations (50%, 97%, increasing concentrations 25-97%) as well as with time of fixation (72, 168 and 336 hrs.)… Optimal time interval was estimated to 40 min by experimenting with scanning in 5 min. subsequent intervals. After that time the quality of image would not show any improvement… We successfully performed 3D reconstruc-tions of the mouse heart with its cavities and visible arrangement of the muscular fibers of the ventricles fusing into the heart vortex (Fig.). Visualization of the blood vessels structures and their branching was recorded in the spatial model of the kidneys. This one also showed identical excretory system and kidney pelvis. In the liver lobes we were able to observe venous portal system that we could analyze in the 3D reconstruction and thus in detail describe branching of the venous system. All our experiments were only first steps in the detailed visualizations of the blood vessels of bigger organs of larger laboratory animals, eventually vascular system of human organs. Study was supported by project of Charles University PRVOUK P34 and P38, 260277/SVV/2016.

STRUCTURAL ANALYSIS OF THE ANTERIOR AND POSTERIOR REGIONS OF THE EXTERNAL ANAL SPHINCTER; THE SPATIAL RELATIONSHIP WITH THE BULBOSPONGIOSUS AND THE COCCYX

Satoru MURO, Phichaya BARAMEE, Janyaruk SURIYUT, Hisayo NASU, Masayo HARADA, Kumiko YAMAGUCHI, Keiichi AKITA

Department of Clinical Anatomy, Tokyo Medical and Dental University, Japan

As surgical procedures have been developed, the surgeons required more exact configuration of the external anal sphincter. The aim of this study is to investigate the precise structure of the anterior and posterior regions of the external anal sphincter. Ten formalin embalmed cadavers were used for macroscopic examinations. The specimens were dissected both from median and lateral aspects. In male specimens, some muscle fibers from the anteroinferior region of the external anal sphincter in the median plane extended anteriorly, and connected to the bulbospongiosus. In addition, some muscle fibers running from the lateral surface of the external anal sphincter also connected to the bulbo-spongiosus. In female specimens, there was no attachment between the external anal sphincter and the bulbospongiosus in the median plane, …we found some muscle fibers from the lateral surface of the external anal sphincter went ahead and connected to the bulbospongiosus. The anterior and the posterior regions of the external anal sphincter are formed in similar pattern that the muscle fibers of the inferior part extend upward in the median plane, while the muscle fibers of the middle part extend from the lateral surface. In the anterior region, the external anal sphincter has a direct connection with the bulbospongiosus. In the posterior region, the external anal sphincter connects to the coccyx through the ano-coccygeal ligament. Therefore, the external anal sphincter and the bulbospongiosus should be considered as a continuous muscle sheet connecting to the coccyx.

HISTORY OF THE TERM VASA VASORUM

Vladimir MUSIL[1], Matej PATZELT[2], Josef SACH[3], Zdenek WURST[2], Jana MRZILKOVA[2], Jitka RIEDLOVA[2], Tomas LISKOVEC[1], David KACHLIK[4], Josef STINGL[l2]

[1]Charles University in Prague, Third Faculty of Medicine, Centre of Scientific Information, [2]Third Faculty of Medicine, Charles University in Prague, Dept of Anatomy, [3]Third Faculty of Medicine, Charles University in Prague, Dept of Pathology, [4]Second Faculty of Medicine, Charles University in Prague, Dept of Anatomy, Czech Republic

The main aim of the study was an exact description of the historical development of the anatomical term vasa vasorum, since the begin of the modern anatomy up to the recent time. The study was done in a form of retrospective literary search, which has brought following results: beginning by Vesalius (1543), the oldest anatomists described and defined only the particular layers of the walls of the great arteries and veins. As the first one in history who described the vascular system supplying the walls of the great arteries was Thomas Willis in 1678. The first who depicted them in the human aorta was Dutch anatomist Frederick Ruysch in 1695. The term vasa vasorum for the designation of these vessels introduced German anatomist Christian F. Ludwig in 1739. Since them this term is regularly used in the anatomy and became a stable part of all versions of the official anatomical terminologies. Special attention was paid to the origin and use of the term "vasa vasorum interna". At present, the vasa vasorum are a subject of intensive molecular biological and angiology research, for possible participation of their neoangio-genesis on the development of the coronary atherosclerosis and on the failure of the aortocoronary venous bypasses. The study was supported by the project PRVOUK P38 of the Charles University in Prague.

QUALITY IMPROVEMENT OF HUMAN SPERMATOZOA DNA FRAGMENTATION DUE TO DENSITY GRADIENT CENTRIFUGATION FOLLOWING FREEZE-THAW CYCLES

Melinda NAGY[1], Ágnes HAJNAL[2], Andrea D SZÉKELY[3], Endre G MIKUS[2]

[1]Humancell MCC Kft., [2]LabMagister Training and Science Ltd., [3]Semmelweis University, Department of Anatomy, Histology and Embryology, Faculty of Medicine, Hungary

Human gametes are best preserved frozen under strict control before being used for assisted reproduction or, 'in vitro' fertilization (IVF). The aim of our study was to shed light on the fact whether density gradient centrifugation of the semen specimen following the freeze – thaw cycle would improve the quality of human semen on the basis of physically separating the damaged spermatozoa. Methods Commercially available density gradients were used on untreated human semen specimens. DNA fragmentation was assessed by flow cytometry based Sperm Chromatin Structure Assay (SCSA). The specimen were kept in liquid nitrogen before being frozen following the guidelines of the SpermCryo All-round (Gynotec) system. Frozen semen specimen were thawed in 37oC water bath and the preparation was performed according to a protocol using the solutions by SpermFilter, SpermWash Gynotec. DNA fragmentation was assessed three times during the procedure, before freezing, after thawing and following the preparation. In harmony with previous observations, we detected an increased rate of DNA fragmentation due to the freezing of spermatozoa, (17.2 % versus 24.0% n=10). However, a subsequent cleaning preparation after thawing the specimen has resulted in a lower level of DNA fragmentation (10.5% n=10), thus leading to an improved sperm quality even superior to that of the original sperm sample. Therefore it is of vital importance to subject each semen specimen, with, or without being frozen/thawed, to be subjected to density gradient centrifugation to increase the quality of the sample thus supporting the successful outcome of assisted reproduction.

PAX2, BMP-2 AND BMP-4 PROTEIN EXPRESSIOS DURING THE FORMATION OF HUMAN SPINAL CORD

Aimar NAMM[1,2], Andres AREND[1], Marina AUNAPUU[1,2]
[1]University of Tartu, Dept of Anatomy, [2]Estonian University of Life Sciences, Dept of Veterinary Medicine, Estonia

The evidence from animal studies indicates that proteins Pax2, BMP-2 and BMP-4 play very important role in the early mammalian embryogenesis. In particular these proteins have been shown to regulate dorsal-ventral patterning of the developing spinal cord… 37 human embryos of Carnegie Stages (CS) 10 - 20 were used in this study. The embryos were fixed in the 4% paraformaldehyde and embedded in paraffin blocks… Sections were incubated with polyclonal antibodies to Pax2, BMP-2 and BMP-4. DAB labelled sections were counterstained with hematoxylin. Our data show that BMP-s tend to be more expressed in the spinal code in earlier stages, in particular BMP-2 and BMP-4 expression was found to be higher at CS 14 as compared to CS 18… Pax2 staining was seen to increase throughout the later stages of spinal cord development and significantly stronger expression was found at CS 16 - 20 compared to CS 10. Furthermore, spatially and temporally restricted expression of Pax2 was observed along the compartmental dorsal-ventral axis of the spinal cord as Pax2 staining was weaker in the ventricular layer of ventral part of the developing spinal cord compared with the developing area of dorsal part. Pax2 is associated with the establishment of the ventral-dorsal boundaries within the developing spinal cord. Our investigation confirmed the idea that Pax2, BMP-2 and BMP-4 are important mediators in the human embryos and may initiate multiple pathways controlling the specification, proliferation and differentiation in the developing spinal cord.

EFFECT OF TREATMENT WITH OLIVE LEAF POLYPHENOLS ON CATALASE, SUPEROXIDE DISMUTASE, AND GLUTATHIONE PEROXIDASE ACTIVITIES IN SKELETAL MUSCLES OF DIABETIC RATS

Marina NIKOLIC[1], Snježana BAJEK[1], Tamara ŠOIĆ-VRANIĆ[1], Juraj ARBANAS[1], Jasminka GIACOMETTI[2]
[1]Faculty of Medicine, University of Rijeka, Department of Anatomy, [2]University of Rijeka, Department of Biotechnology, Croatia

Increased reactive oxygen species (ROS) could play an important role in the pathogenesis of many metabolic disorders including diabetes mellitus (DM). Elevated ROS level in DM may be due to decrease the activity of catalase (CAT), superoxide dismutase (SOD) and glutathione peroxidase (GPx)…The goal of this study was to investigate the effect of olive leaf polyphenols (OLPs) treatment on CAT, SOD and GPx levels in skeletal rat muscle (soleus) of diabetic rats. DM type 1 was induced by a single administration of streptozotocin (SZT) in male Wistar rats. The blood glucose was monitored at set time intervals. OLPs extracts (512, 768 and 1024 mg/kg) were i.p. administrated during 7-days after induced DM. The activities of CAT, SOD, and GPx were determined in rat soleus muscle. Differences between the groups assessed by an ANOVA one-way, and $p<0.05$ were considered to be statistically significant. CAT, SOD and GPx activity were significantly changed in rat soleus. SOD and GPx activities markedly decreased in diabetic rats. SOD and CAT activities were significantly increased at the dose of 1024 mg/kg OLP, and GPx activity was increased at the dose of 512 mg/kg. Also, CAT and SOD activities were correlated significantly ($R=0.515$). Olive leaf polyphenols were efficient for restoring muscle function in diabetic rats. A higher dose of 7-days OLP treatment stimulated the activity of CAT and SOD while lower dose increases the activity of GPx. This study confirms the relationship between a redox-modulating mechanism SOD and CAT and OLPs in diabetic rat muscle.

COCOA POLYPHENOLS INCREASE CATALASE, SUPEROXIDE DISMUTASE AND GLUTATHIONE PEROXIDASE ACTIVITIES OF SKELETAL MUSCLES IN DIABETIC RAT

Marina NIKOLIC[1], Snježana BAJEK[1], Tamara ŠOIĆ-VRANIĆ[1], Luka ĐUDARIĆ[1], Jasminka GIACOMETTI[2]
[1]Faculty of Medicine, University of Rijeka, Department of Anatomy, [2]Department of Biotechnology, University of Rijeka, Croatia

Oxidative stress (OS) in diabetes mellitus (DM) can modify a number of the signaling pathways within a cell, and in this way, ultimately lead to insulin resistance as well as to diabetic complications…Skeletal muscles play an important role in maintaining glucose homeostasis. The inability to repair damaged skeletal muscle is one of a characteristic feature of uncontrolled diabetes. Dietary polyphenols are recognized to control OS at different levels, including modulating the expression of multiple regulatory elements comprised of antioxidants (e.g., glutathione) and enzymes (e.g., superoxide dismutase, catalase). Cocoa is a rich source of flavanols, which have a beneficial effect on many disorders caused by the OS, also improve blood lipid profiles and reduce insulin resistance in diabetes. DM was induced by a single administration of streptozotocin (SZT) in male Wistar rats. The blood glucose was monitored at set time intervals. In the group treated with cocoa, drinking water was replaced with a cocoa drink (0.5%, w/v, cocoa powder in water) during one month (ad libitum) after SZT-induced DM. The activities of CAT, SOD, and GPx were determined in rat soleus and tibialis muscles…Cocoa has a modulated expression of enzymes and antioxidants in rat skeletal muscles, soleus, and tibialis, so allows muscle dysfunction repair in diabetic rats. This study suggested an important role of polyphenols which acting through a redox-modulating mechanism.

THE MORPHOLOGICAL STUDY OF THE EXTRAFORAMINAL LIGAMENTS IN CERVICAL AND THORACIC LEVELS

Pawaree NONTHASAEN, Hisayo NASU, Kumiko YAMAGUCHI, Akimoto NIMURA, Keiichi AKITA
Tokyo Medical and Dental University, Clinical Anatomy, Japan

The extraforaminal ligaments (EFLs) connecting between bones or between a bone and a spinal nerve root have been reported. We examined the relationships of the EFLs with bones, spinal nerve roots and connective tissues in detail. During dissection, we also found the connecting structures between the spinal nerve roots. In the present report, we focus to clarify the connecting structures among the spinal nerve roots in lower cervical and upper thoracic levels. Twenty sides from 10 cadavers (2 males, 8 females, average age; 89.5) were dissected. The spinal nerve roots and EFLs were carefully dissected from C4 - T4 vertebrae. After observation of EFLs, the anterior tubercles and the proximal ribs were removed and the connecting tissues between the spinal nerves were dissected … The radiating ligaments were composed of anterior and superior parts and were attached to the uncovertebral joint, transverse process and spinal nerve roots at C4-C8 levels. The costotransverse ligaments were composed of superior and inferior parts and were attached from ribs to transverse process at T1-T4 levels. After removed anterior tubercles, interestingly, we found the tissues connecting between the spinal nerve roots at C7-T1 levels in all sides. The tissues consisted of vessels, fats and connective tissues. The tissue connecting C7-C8 spinal nerve roots were found passing through the foramen transversarium at C7 level. Also, the tissue connecting C8-T1 spinal nerve roots were found passing through the foramen costo-transversarium at T1 level. The connecting tissue was not observed at C4-C6 and T2-T4 levels…

THE POTENTIAL KINEMATIC AND PROPRIOCEPTIVE ROLE OF THE LIGAMENTUM MUCOSUM

Madeleine E NORRIS[1], Marjorie JOHNSON[1], Martin SANDIG[1], Tim BURKHART[2], Alan GETGOOD[3]
[1]The University of Western Ontario, Dept of Anatomy & Cell Biology, [2]Lawson Health Research Institute, [3]Fowler Kennedy Sport Medicine Clinic, Canada

The ligamentum mucosum (LM) is a non-isometric structure of the knee joint that traverses from the intercondylar notch of the femur to the infrapatellar fat pad (IFP). The LM is composed of dense regular connective tissue. Pathological LM appears fibrotic which can lead to impingement, and it has been suggested that this can lead to pathogenesis of anterior knee pain (AKP). However, the relationship between the morphological and biomechanical characteristics of the LM has not be investigated. The aim of this study was to define the mechanical function of the LM and its potential role in proprioception. Fourteen fresh-frozen cadaveric knee specimens (mean (SD) age = 73 (18) years) were dissected. Maintaining the proximal and distal attachments, two specimens were harvested for histological analysis using standard H & E, Masson's trichrome, and mono-clonal mouse anti-human NFP. The remaining five specimens were harvested for biomechanical testing, maintaining the LM attachment to the distal femur, IFP, and corresponding patella. 64% of the knees had a LM present with 50% and 14% categorized as separate and vertical septum type, respectively. The histological analysis confirmed the LM to be ligamentous, composed of dense regular connective tissue. The immunohistochemistry results remain inconclusive as there was no evidence of peripheral nerve with respect to the specimens included in this study. The average peak force of the LM at failure was 31.9 N, and the average stiffness and strain of the LM was 5.1 N/mm and 0.83, respectively.

A MORPHOLOGICAL ANALYSIS OF THE PLANTARIS TENDON COURSE AND TYPES OF ITS INSERTION IN THE ADULT HUMANS

Łukasz OLEWNIK[1], Grzegorz WYSIADECKI[1], Michał POLGUJ[2], Mirosław TOPOL[1]
[1]Medical University of Lodz, Department of Normal and Clinical Anatomy, [2]Medical University of Lodz, Department of Angiology, Poland

Aim The purpose of this study was to determine the anatomic relationships between the course of the plantaris tendon (PT) and the calcaneal tendon, and to identify the types of insertion of the plantaris tendon that may be important in pathogenesis of the Achilles teninopathy. Methods Sixty randomized and isolated lower limbs (29 left and 31 right) was dissected. Results Five types of insertion were found for the plantaris tendon. Type 1 (29 limbs/48,3%) is characterized by a wide, fan-shaped insertion to the calcaneal tuberosity on the medial side of the Achilles tendon. Type 2 (12 limbs/20%) is characterized by insertion with a slight branching of the plantaris tendon to the calcaneal tuberosity. Type 3 (5 limbs/8,3%) is characterized by insertion at the calcaneal bone, anterior to the calcaneal tendon. Type 4 (2 limbs/3,3%) is characterized by the insertion at the deep crural fascia over the calcaneal tuberosity. Type 5 (12 limbs/20%) is characterized with a very wide insertion encircling the posterior and medial surfaces of the Achilles tendon. Two variants of a course of the plantaris muscle tendon were found. Variant I (53 limbs/88,3%). PT crossed the space between gastrocnemius (GM) and soleus muscle(SM), and ran on the medial part of the leg, medial to Achilles tendon. This variant connected with Type 2 of insertion PT at calcaneal tuberosity is cinsider to affect the patology in this area. Variant II (7 limbs/11,7%) crossed the space between GM and SM, and ran on the medial part of the leg, and next anterior to Achilles tendon. Conclusions The course of the plantaris tendon and its mobility range in relation to the calcaneal tendon may affect the occurrence of pain in the lower medial part of the shin i.e. the Achilles tendinopathy.

THE EXAMINATION OF THE INFERIOR LUMBAR TRIANGLE IN THE HUMAN CADAVERS

Chatzioglou G NTELI, Hassan BAGHERI, Yelda PINAR, Figen GOVSA
Ege University, Medical Faculty, Dept of Anatomy, Turkey

Petit's hernia is caused by a defect in the inferior lumbar triangle, which is described as the external oblique muscle anterolaterally, the latissimus dorsi muscle posteromedially, and the iliac crest anferiorly. Knowledge of general anatomical locations, causes and relevant clinical findings of lumbal hernias will provide for easier understanding and aid in improved clinical outcomes. The posterior body wall was dissected in 25 adult male cadavers, fixed with 10% formaldehyde solution. The structures of lumbal area were examined bilaterally. Diameters of the inferior triangle were made with a micrometer. The layers were easily dissected and the transverse aponeurosis was bloated. Petit triangles were classified in according its surface area into four distinct types: Type I or small triangle < 8 cm2, type II or intermediate 8-12 cm2, type III or large triangle >12 cm2 and type 0 or no triangle did not exhibit a triangle; instead, the aponeurosis of the transversus abdominis was enclosed by the external abdominal oblique muscle and the sacrospinalis muscle. Type I triangle is seen most of. Conclusion: Repair needs to be individualized, depending upon the size of the defect. Small or moderate-size inferior lumbar hernias can be repaired by approximanition of the transversalis fascia along with the fascia of the transversus abdominis muscle. In the large defects, mesh repair is mandatory. The shape and size of the triangle of Petit is important in the hernia formation and determining surgery procedure.

THE PROPORTION OF THE CONTACT SURFACE AREA OF THE TOES TO THE TOTAL CONTACT SURFACE AREA OF FOOT

Fikri OZDEMIR[1], Mahmut OZEL[1], Murat GOLPINAR[1], Mert NAHIR[1], Ibrahim ERKAN[2], Ibrahim ABDI AHMED[3], Amani ELFAKI[1]
[1]Ondokuz Mayis Univ, Dept of Anatomy, Turkey, *[2]Ondokuz Mayis Univ., Dept of Biostatistics and Medical Informatics, Turkey*, *[3]Zemzem Univ., Dept of Anatomy, Somalia*

The human foot is a unique structure, formed by numerous bones and joints. It is typically considered as a "functional unit"…The aim of this study is to analyze the measurements of contact surface area of foot and to explore the proportion of contact areas of the toe and foot. Sixtynine (42 male and 27 female) healthy subjects, with no known musculoskeletal impairments participated in this study, their ages range between 18 and 25 years…Water-based dye was used to determine the footprints on the cardboard paper. The footprints were scanned with Samsung SCX-3405 scanner. The contact surface area of the toe and the foot for each subject were measured using ImageJ software. Statistical analysis was performed using IBM SPSS Statistics 21… There was no significant difference between right and left proportion of contact surface area of toe to the contact surface area of foot in female (sig=0.21) ($p>0.05$) or in male (sig=0.07) ($p>0.05$). There was no significant difference in the proportion of right contact surface area of toe to the right contact surface area of foot between female and male (sig=0.57) ($p>0.05$). And there was significant difference in the proportion of left contact surface area of toe to the left contact surface area of foot between female and male (sig=0.21) ($p\leq0.05$)…

MORPHOLOGICAL CHARACTERISTICS OF THE PERICALLOSAL ARTERY

Marija PAPAZOVA, Julija ZHIVADINOVIK, Niki MATVEEVA, Ace DODEVSKI, Biljana ZAFIROVA
Medical Faculty, Institute of Anatomy, Macedonia

Introduction: Cerebral circulation, especially arterial, in recent decades has attracted the interest of anatomists and clinicians. The anterior cerebral artery is a major vessel responsible for the blood supply to the interhemispheric

region. The distal segment of anterior cerebral artery has central and cortical branches, one of them is pericallosal artery. The pericallosal artery supplies with blood corpus callosum and anteromedial part of the parietal cortex. The aim of this study was to determine the morphological and topographic characteristics of the pericallosal artery. Materials and methods: The investigations of anatomical characteristics of the pericallosal artery was made on 133 human brains without cerebrovascular pathology, from both sexes at age from 23 to 68. Brains were fixed in a 10% solution of formaldehyde, and the obtained material was analyzed using a stereoscopic light microscope. Results: The length of the pericallosal artery was in range from 55 to 129 mm, with mean value of 78.4 mm. The diameter of pericallosal artery was in range from 0.7 to 1.3 mm, with a mean value of 1 mm. Conclusion: Detailed anatomical knowledge of the pericallosal artery is important when considering vascular surgery in the area of the anterior portion of the circle of Willis.

BROWSING SOFTWARE OF HEAD SECTIONED IMAGES FOR ANDROID MOBILE DEVICE

Jin S PARK
Dongguk University School of Medicine, Department of Anatomy, South Korea

The interpretation of computed tomographs and magnetic resonance images to diagnose patients requires basic knowledge of sectional anatomy. The aim of this research was to present a software for android mobile device for learning anywhere sectional anatomy. Using JAVA language on Eclipse Java IDE for web developers for personal computer, the computer engineer programmed the browsing software which sectioned images and segmented images could be viewed continuously in android mobile device. We prepared sectioned images (resolution, 2071 X 2064; color depth, 48 bit color) and segmented images of 231 segmented structures of our previous research. The resolution of images was decreased from 2071 X 2064 to 400 X 458 and put into the browsing software. After transferring the software to android mobile device (Samsung Galaxy S7, Android version 6.0.1), the software was debugged. The software was registered in Google play store. On the browsing software, the sectioned images could be browsed continuously and zoomed-in and –out. When a structure on the images was touched by using a finger, names of each structure were popped up. This software including the sectioned images and segmented images of male head will hopefully assist students in the study of the topographic anatomy and sectional anatomy of the head, as well as neuroanatomy. For assisting the students, the software is available free of charge (https://play.google.com/store/apps/details?id=com.anatomy.vkh_android). This work (2012R1A2A2A01012808) was supported by Mid-career Researcher Program through NRF (National Research Foundation) grant funded by the MEST (Ministry of Education, Science and Technology).

SUPPORTING 3D DEVELOPMENTS FOR TEACHING ANATOMY AND HISTOLOGY

Friedrich PAULSEN[1,2], Franziska BERTELSHOFER[3], Oliver BREHM[3], Simone GAFFLING[4], Rolf JANKA[5], Günther GREINER[3], Samir JABARI[6], Michael SCHOLZ[1], Lars BRÄUER[1]
[1]Friedrich Alexander Univ. Erlangen-Nürnberg, Dept of Anatomy II, [2]Friedrich Alexander Univ. Erlangen-Nürnberg, Erlangen Graduate Sch. in Advanced Optical Technologies (SAOT), [3]Friedrich Alexander Univ. Erlangen-Nürnberg, Chair for Computer Graphics, [4]Friedrich Alexander Univ. Erlangen-Nürnberg, Pattern Recognition Lab, [5]Friedrich Alexander Univ. Erlangen-Nürnberg, Inst. of Radiology, [6]Friedrich Alexander Univ. Erlangen-Nürnberg, Inst. of Anatomy I. Germany

A current challenge for medical students is to study and understand the three dimensional structures of the human body by the use of two dimensional teaching materials such as anatomical atlases and textbooks, histological sections and more. Fundamental topics in macroscopy are the structures of the human skull and in histology nearly all tissues and organs. The talk will demonstrate a newly developed browser application termed „Skully“ visualizing stereoscopic models of the bones of the human skull. The user is able to interact with those models, e.g. virtually move them freely to gain insight in the three dimensional structure and the position of the single bones, highlight separate single or even several bones and view textual annotations and explanations. In a developer mode those annotations can be edited easily by anatomy experts or course tutors to provide and save all topic relevant information. Furthermore the application can be used on various platforms, e.g. computers with different operating systems, tablets and mobile phones. Moreover, the talk will give first impressions of a currently developed method for a 3D tissue reconstruction of digitized and digitally based processed histological sections of embryonic and fetal organs for anatomical teaching.

SKELETAL DEVELOPMENT OF FORELIMB OF IGUANA IGUANA

Fernando PEREIRA KLEBER[1], Paulo SANTOS ODEONY[1], Dayane K. SABEC-PEREIRA[1], Santos A L QUAGLIATTO[2], Antônio SEBBEN[3], Fabiano CAMPOS LIMA[1]
[1]Federal University of Goias - Regional Jataí, [2]Federal University of Uberlândia, Institute of Veterinary Medicine, [3]University of Brasília, Institute of Biosciences, Brazil

Investigations addressing the ontogeny of vertebrates aim to standardize the description of a developmental sequence, supporting discussions about the animals evolution. Aiming to clarify the pattern of the ontogeny of Iguana iguana iguana, embryos artificially incubated at a constant temperature were collected daily and fixed in formalin solution 10%. The sample was cleared with KOH and stained with Alizarin red and Alcian blue…In the forelimb the formation of the distal elements was observed for all five digits. I. iguana iguana has one central and intermedium element of carpus. These were formed by an independent condensing apart from digital arch and its ossification occurs in post hatching. The presence of two distal elements of the tarsus is shared with most reptiles. It was not possible to ascertain clearly the astragalus origin. We observed a clouded condensation area in the central region of the tarsus that originated this element, but the presence of individual structures was not confirmed. Astragalus and fibular merged to form the proximal tarsal, which started to ossificate in the embryonic period (stage 42) by two individual ossification centers. The distal elements III and IV were the only ones differentiated, the others remained fused with metatarsal cartilage. The digit V presented late development in all embryos. The ossification of the limbs and vertebrae occurred as described for other reptiles. Using similar methodology, it was possible to approximate these results with data of other lizards, verifying many similarities, what confirmed the conservative pattern of embryonic development for reptiles.

AGE RELATED CHANGES IN SUPRASCAPULAR NOTCH MORPHOLOGY – A COMPUTED TOMOGRAPHY STUDY

Michał PODGÓRSKI[1], Michał POLGUJ[2], Mirosław TOPOL[3], Artur KUSAK[4], Maciej ŁUKASZEWSKI[4], Piotr GRZELAK[5]
[1]Medical University of Lodz, [2]Medical University of Lodz, Dept of Angiology, [3]Medical University of Lodz, Dept of Anatomy and Histology, [4]Polish Mother's Memorial Hospital Research Institute, Dept of Diagnostic Imaging, [5]Medical University of Lodz, Dept of Diagnostic Imaging, Poland

Aim: Although suprascapular notch characterize with variable morphology, its development is not well studied. On the other hand, this morphology is one of the leading risk factors of the suprascapular nerve neuropathy. We hypothesize that the final form of the suprascapular notch develops postnataly. Thus aim of this research was to characterize morphology of the suprascapular notch in paediatric population. Methods: A retrospective analysis was performed of 291 chest computed tomography examinations of patients under 18 years old.

Examinations were taken following other clinical indications (e.g. congenital heart defects, lung diseases, mediastinal masses). The inclusion criteria were as follows no pathologies concerning the scapulae; both scapulae encompassed in a field of view; no artefacts. Based on measurements and visual assessment, the suprascapular notch was classified according to a five-fold classification (type I-deeper than wider; type II-equally deep and wide, type III-wider than deeper; type IV-bony foramen, type V-discreet notch). Results: In all, 173 examinations were included (60 females and 113 males). The most common suprascapular notch types were type V (discreet notch, 225 scapulae; 65.0%) and type III (wider than deeper, 114 scapulae; 32.9%). Children with discreet suprascapular notch were significantly younger than children with other types. In types I-III, a positive correlation was found between age and dimensions of the suprascapular notch. Conclusions: This study provides the first description of the suprascapular notch in a paediatric population based on computed tomography. It confirms that the suprascapular notch receive its final shape postnataly.

DOES THE MORPHOLOGY OF THE INTERNAL JUGULAR VEIN AFFECT THE ELASTICITY OF THE COMMON CAROTID ARTERY?

Michał PODGÓRSKI[1], Monika A WINNICKA[1], Michał POLGUJ[1], Piotr GRZELAK[2], Maciej ŁUKASZEWSKI[3], Ludomir STEFAŃCZYK[2]

[1]Medical Univ. of Lodz, [2]Medical Univ. of Lodz, Dept of Radiology and Diagnostic Imaging, [3]Polish Mother's Memorial Hosp. Research Institute, Dept of Diagnostic Imaging, Poland

Aim: Arterial stiffness is an early marker of atherosclerosis. However, its assessment is based on the elastic properties of the artery, which may be influenced by the adjacent internal jugular vein (IJV). The aim of the present study is to evaluate the influence of internal jugular vein morphology on the stiffness of the common carotid artery. Methods: Bilateral carotid ultrasound was performed in 248 volunteers. When no carotid plaque was detected (90.9% cases), the distensibility coefficient and β - stiffness index were calculated. In the same individuals the circumferential strain and strain rate of the carotid wall were evaluated with 2D-Speckle Tracking. This newly developed sonographic technique allows to assess the movement of the arterial wall in general as well as for its particular segments. The cross-sectional area of the IJV and degree of its adherence to the carotid wall (angle of adherence) were measured. Results: The morphology of the IJV did not influence the standard stiffness parameters nor the global circumferential strain. However, segmental analysis found the segment adjacent to the IJV to have significantly higher strain parameters than its opposite counterpart. In addition, in this segment the strain correlated significantly and positively with IJV cross-sectional area and angle of adherence. Conclusions: The passage of the pulse wave creates a nonhomogeneous deformation of the carotid artery wall. The greatest strain is observed in a segment adjacent to the IJV. Bigger size of the vein and greater degree of its adherence implicate more pronounced deformation.

THE INFLUENCE OF THE MORPHOLOGY OF THE SUPRASCAPULAR NOTCH ON THE ULTRASOUND VISUALIZATION OF THE SUPRASCAPULAR NERVE

Michał POLGUJ[1], Hubert JEZIERSKI[2], Michał PODGÓRSKI[3], Agata MAJOS[4], Mirosław TOPOL[3]

[1]Medical University of Lodz, Dept of Angiology, [2]Ministry of the Interior Hospital, Dept of Orthopedics and Traumatology, [3]Medical University of Lodz, Dept of Normal and Clinical Anatomy, [4]Medical University of Lodz, Dept of Radiological and Isotopic Diagnosis and Therapy, Poland

Aim The suprascapular notch is a depression on the superior border of the scapula. This region is the most important point on the course of suprascapular nerve, because it is the most common place for suprascapular nerve injury and entrapment. The aim of the study is to determine the influence of the morphology of the suprascapular notch on the effectiveness of ultrasound visualization of the suprascapular nerve at this region. Methods The type of suprascapular notch was ultrasonographically determined in 78 patients using the classification system described by Polguj et al. (2011) with a modification for sonographic visualization (2015). This classification system is based on the shape of the inferior border of the incisura, as well as a comparison of the two main geometrical measurements: maximal depth (MD), and superior (STD) transverse diameter. Results: The supra-scapular nerve was recognized in 48 cases, among which, the type IV / V suprascapular notch occurred significantly more frequently than types I-III: 21 type IV / V suprascapular notches (60.3%) compared to 27 type I-III (24.5 %), ($p = 0.0023$). The type I – III notches which revealed the presence of a suprascapular nerve were significantly wider and shallower than average. Conclusion Sonographic visual-ization of the suprascapular nerve is possible and may be useful in several procedures around this region. Ultrasonographic suprascapular notches. Examination of the suprascapular nerve is more likely to be successful when used for type IV/V.

BORDERLINE ANATOMY - A NEW COURSE IN THE CURRICULUM OF PECS UNIVERSITY

Dóra REGLŐDi Balázs D FÜLÖP, József FARKAS, Viktória VICENA, Andrea LUBICS, Andrea TAMÁS, Tibor HOLLÓSY

University of Pecs, Department of Anatomy, Hungary

A new optional course was introduced in the medical curriculum on the diverse aspects of anatomy. The topics include interesting anatomy-related topics with many different fields of anatomy. Although this knowledge is not necessarily required for the medical curriculum, it might help the student to learn anatomy with more interest and enthusiasm. The course also gives an insight into different kinds of Anatomy curriculum, like what kind of Anatomy a massage therapist or a veterinary needs in comparison to medical students and also shows some other Anatomy teahing systems from different universities worldwide. Expert lecturers were also invited for Dinosaur anatomy and for Anatomy teaching in Art Schools. The main topics are the following: Anatomy and Art (Leonardo's Anatomy to modern artists, parallelism between anatomy stuctures and art, creating art from structures; Rembrandt's painting: Dr Tulp's Anatomy); Anatomy museums and bone collections; Anatomy of Tortures and Body Modicifactions; Anatomy of anthropology (from mummies to skull identifications); Massage and body building anatomy; Anatomy Teaching at other Universities; Eponymes - who is behind the anatomical names?; history of Anatomy and Surgery; Plastic surgery and Anatomy; heavy metal and Anatomy; Cemetary culture and Anatomy; Antropology and comparative Anatomy. Students are offered to collect an anatomy-related topic themselves and submit a powerpoint presentation instead of writing a test. The experience of the first courses shows that the acceptance of the course is very good, students enjoyed these broad and interesting „borderline" aspects of anatomy and most students enjoyed preparing for a presentation themselves

ANTHROPOLOGICAL STUDY OF BREAST-FED INFANTS IN THE CZECH REPUBLIC

Jitka RIEDLOVÁ[1], Marketa PAULOVA[2], Jana VIGNEROVA[3]

[1]Third Fac. of Medicine, Charles Univ., Dept of Anatomy, [2]National Inst. of Public Health, [3]National Lactation Center, Czech Republic

Czech Republic enjoys a long term tradition of nationwide anthropological research (CAV), which represents a data source for basic bodily parameters growth charts (length/ height, BMI, abdominal circumference, arm and gluteal circumference) since 1951. In 2006, World Health Organiz-ation (WHO) published new growth standards based on the measurements of long term breast-fed children. It was an attempt to introduce these into the children health care system worldwide. In the Czech Republic, a year study of the National Institute of Public Health comparing WHO standards

and growth references (CAV) whose results showed important differences between children not only in terms of weight but also in other measured parameters was done in the 2008. In the years 2009-2011, a study focused on growth of long term breast-fed Czech children (471 boys and 489 girls) was conducted. Growth charts created on the basis of data from the study were analysed in order to figure out deviations in growth compared to reference charts of CAV and WHO standards… Based on the results of the Czech breast-fed children study we can postulate that in all measured parameters growth of Czech breast-fed children is closer to CAV compared to WHO standards. Therefore we suggest using existing reference charts obtained from the nationwide anthropological research of CAV in years 1991 and 2001 in the Czech Republic. This study was supported by project P02 of the Charles University and by grant NS9974-4/2008.

AFLIBERCEPT COUNTERACTS PATHOLOGIC VASO-PROLIFERATION, MODULATES INFLAMMATION AND TRIGGERS A TIP CELL-DRIVEN VASCULAR REGENERATION AFTER HYPOXIC RETINAL DAMAGE IN MICE

Jesus E. ROJO ARIAS[1], Hector MONTECINO[1], Matina ECONOMOPOULOU[2], Henning MORAWIETZ[3], Richard H W FUNK[1], József JÁSZAI[1]

[1]Technische Univ. Dresden, Medizinische Fakultät, Institut für Anatomie, [2]Technische Univ. Dresden, Uniklinikum, Klinik und Poliklinik für Augenheilkunde, [3]Technische Univ. Dresden, Uniklinikum, Medizinische Klinik III, Bereich Gefäßendothel und Mikrozirkulation, Germany

A particularly well-studied paradigm of retinal hypoxic stress is the murine oxygen-induced ischemic retinopathy model (OIR). An exuberant vaso-proliferative response occurs in this model, mimicking late severe forms of proliferative diabetic retinopathy (PDR). Consecutive hyper- and normoxia (relative hypoxia) applied during early post-natal development induce regression of the central retinal vasculature and uncoordinated proliferation of endothelial cells occurs leading to the formation of pathological epiretinal glomeruloid tufts. The murine OIR model offers an excellent system for testing the efficacy of antiangiogenic substances and studying mechanistic aspects of microvascular regeneration. The primary objective of our study was to investigate the efficacy of VEGF-Trap (Aflibercept), a recombinant decoy receptor ("receptor body") recognizing ligands of both VEGFR-1 and –2, in inhibiting pathological retinal neovascularization and promoting microvascular regeneration (i.e. ordered revascularization). Besides completing a detailed morphological characterization of the microvascular network upon VEGF-blockade, we also analyzed reactions of microglia/(infiltrating) macrophage cells as well as VEGF/VEGFR related signaling cascades. Our results indicate that Aflibercept application significantly inhibits aberrant vaso-proliferation of the superficial microvascular plexus and triggers a tip cell-driven regenerative mechanism responsible for an accelerated revascularization of the central avascular area in the hypoxia-damaged retina. Furthermore, the substance modulates the inflammatory response associated with the hypoxic damage by decreasing vascular permeability and affects the activation state of phagocytic cells, increasing the proportion of cells with a ramified morphology. Our results indicate that most of the pathological vascular changes could be reliably reduced by means of Aflibercept in OIR mice, resulting in faster vascular regeneration without significant side effects on normal vascular development/ architecture.

TOPOGRAPHICAL ANATOMY OF MAXILLARY AND MANDIBULAR ALVEOLAR PROCESS FOR INSERTION OF TEMPORARY ANCHORAGE DEVICES DURING ORTHODONTIC TREATMENT

Mirela ROZPRAVKOVA[1], Květuše LOVÁSOVÁ[2], Darina KLUCHOVÁ[2], Mária MATUŠEVSKÁ[3], Jana PRIBULOVÁ[3]

[1]University Faculty of medicine Košice, Dentistry, [2]Department of Anatomy, Pavol Jozef Šafárik University, [3]Private dentálne office, Dentistry, Slovakia

There is increased interest in orthodontic therapy by fixed appliances because interest in physical appearance is greater nowadays. Orthodontic treatment generated forces which move the teeth into the desired position, but according to Newton's third law of action and reaction also forces that move other teeth to undesired position. Anchorage unit should be part of the treatment plan supported by complete documentation. One of the types of anchorage systems is skeletal anchorage, temporary anchorage devices (mini-implants). The aim of this research is to increase interest in common use of miniimplants in daily orthodontic practice by providing an unique photographic documentation of orofacial region. Methods: In this anatomical study we used 8 human adult male and female cadaveric heads (sagittal sections) aged 30 to 80 years with different dental status. The cadaveric material was fixed in 10% formalin. Photographical documentation of maxillary and mandibular alveolar process defines anatomical map of the safe areas for insertion of miniimplants. The study presents topographic particularities of the mandibular canal in toothless mandible, pneumatization of maxillary sinus, atrofic changes of alveolar process, localisation of mandibular canal, as well as relationship of external morphology of the mandible and the course of mandibular canal. Conclusion: The exact determination of the anatomical ratios and structures in orofacial region is essential for the successful implementation of diagnostic, therapeutic or surgical procedures. The essential part of success in orthodontic treatment is knowledge of anatomy. This requirement is supported by the global trend linking anatomy lessons and clinical lessons.

EVALUATION OF THE EFFICIENCY OF THE BRAINSUITE AND FREESURFER FOR THE BRAIN SEGMENTATION AND PARCELLATION

Bunyamin SAHIN, Amani ELFAKI

Ondokuz Mayis University, Faculty of Medicine, Department of Anatomy, Turkey

The relation between structure and function is the goal of many neuroscience studies. For this purpose, magnetic resonance (MR) images are taken, then processed to obtain the results. The BrainSuite (BS) and FreeSurfer (FS) software are two well-known programs for the structural brain analysis… In this study, we compared two softwares; together with data obtained from control and patientgroups…MR images of 30 Healthy and 30 Schizophrenic males were taken from the image bank of a previous study that was approved by the ethical committee of the Gezira University/ Sudan. The images were analyzed using two software, BS and FS. The segmentation and parcellation results of regions of interests (ROIs) belonging to the right hemisphere were used for further analysis. Mean volume of the hemisphere, thalamus and motor cortex; mean pial surface areas of the hemisphere, motor cortex and mean thickness of the hemisphere and motor cortex were compared between the groups and software. Volume fraction of thalamus, surface fraction of motor cortex and thickness fraction of motor cortex within the hemisphere were assessed as normalization of the data. The normalized data were also compared between the groups and software. The normalized volume of motor cortex (6.88 and 7.22%) was different between the groups in BS ($p \leq 0.05$). Only thalamus volume (8.14 and 7.44 cm3) and hemisphere-thickness(2.44 and 2.36 mm) were significantly different between the groups in FS ($p \leq 0.05$). The comparisons between the results of both software were different for all data except for the normalized volume of the thalamus and normalized surface of the motor cortex ($p \leq 0.05$). The results showed that the obtained ROI data were different between the software except for the normalized values for volume of thalamus and pial surface of motor cortex. However, the group comparisons were mainly similar.

EVALUATION OF THE MIDSAGITTAL SECTIONAL SURFACE AREA OF THE CEREBELLUM IN CHRONIC SCHIZOPHRENIA

Bunyamin SAHIN[1], Murat GOLPINAR[1], Alaa IBRAHIM[1], Osman ALI TAHIR[2], Mennan E PIRZIRENLI[1], Mohamed ABDELRAHMAN[3], Amani ELFAKI[1]

[1]Ondokuz Mayis Univ., Faculty of Medicine, Dept of Anatomy, Turkey, *[2]Ahfad Univ. for Women, Dept of Psychiatry, Sudan*, *[3]National Ribat Hospital, Dept of Radiology, Sudan*

Morphological and functional abnormalities of the cerebellum are associated with schizophrenia. Several recent neuro-imaging studies have focused on morphological changes of the cerebellum in schizophrenia; however… there is no consensus regarding a cerebellar size abnormality in schizophrenia. Our aim is to describe a new approach for the evaluation of surface area and surface area fraction of cerebellum in patients with schizophrenia. Fifty-seven schizophrenic and 88 healthy subjects participatedint he study. Structural magnetic resonance imaging was done to both groups with SIEMENS 1.5 Tesla scanner. The DICOM images were analysed using the ImageJ software… The midsagittal sectional surface areas of the cerebellum, brain and intracranial cavity were measured using the planimetry technique. Surface area fraction of cerebellum within brain and surface area fraction of cerebellum within intracranial cavity was also estimated. The mean of the midsagittal sectional surface area of the cerebellum in patients and controls were 10.45±1.53 cm2 and 11.43±1.92 cm2, respectively. The mean of the midsagittal sectional surface area fraction of cerebellum within brain in patients and controls were 7.50±1.05% and 7.91±1.36%, respectively …The comparison between the sexes across the groups showed that the male schizophrenics have smaller midsagittal sectional surface area and surface areas fraction of the cerebellum than that of the controls (P<0.050). However, no significant differences were found between female schizophrenics and female controls (P>0.050). Reduction in size of cerebellum may induce the positive symptoms, negative symptoms and cognitive impairments in schizo-phrenia. The current findings showed that, changes of the midsagittal sectional surface area and surface area fraction of the cerebellum in schizophrenia showed sex dependant differences that may help in the diagnosis of the disorder. The methods described in this study are a simple, practical and unbiased approach to evaluate the size of cerebellum in schizophrenia as well as in neurodegenerative disorders.

A NEW APPROACH FOR EVALUATION OF THE MEDIAL SURFACE AREA OF THE BRAIN IN SCHIZOPHRENIA ON MIDSAGITTAL SECTION

Bunyamin SAHIN[1], Alaa IBRAHIM[1], Ali T OSMAN[2], Abdelrahman MOHAMED[3], Fikri OZDEMI[4], Murat GOLPINAR[1], Amani ELFAKI[1]

[1]Ondokuz Mayis University, Faculty of Medicine, Dept of Anatomy, Turkey, *[2]National Ribat University, Faculty of Medicine, Dept of Anatomy, Sudan*, *[3]National Ribat Hospital, Dept of Radiology, MRI Section, Sudan*, *[4]Hitit University, Faculty of Medicine, Dept of Anatomy, Turkey*

Previous studies revealed that the of size the brain decreases in the patient suffering from the schizophrenia. The volume assessments were done by means of the Cavalieri principle or the brain segmentation and parcellation… The aim of the present study is to evaluate the medial surface area of the brain in schizophrenia on midline using stereological analysis. 57 schizophrenic patients (30 male - 27 female) and 88 controls (51 male – 37 female) participated in the study, approved by the ethical committee of the Gezira University/ Sudan. Data was collected using questioner and magnetic resonance imaging scan. DICOM images were analyzed using ImageJ software. Midsagittal section slide was selected using specific criteria. The medial surface area of the brain and midsagittal surface area of intracranial cavity were delineated and the medial brain surface area fraction was estimated. Results: The mean of the brain medial surface area of schizophrenics and control groups were 139.61 ±10.03cm2 and 144.85±8.52cm2 respectively, the mean brain medial surface area of the schizophrenics was lower than that of controls (P<0.050)… Between sexes across groups the mean midsagittal surface area of intracranial cavity of schizophrenic female (159.26 ±11.35cm2) was lower than control female (166.16 ±8.16cm2) (P<0.050). There was no significant different concerning the brain medial surface area fraction between groups and sexes across groups (P>0.05). The present findings suggest that brain volumetric changes in schizophrenia could be due to the brain surface abnormality. Also the current findings supported the sex related differ-ences of schizophrenia indicating that the abnormalities were more severe in females. The method used in this study is useful for quantify researches in schizophrenia.

AN ANATOMIC STUDY OF THE FUNCTIONAL RELATIONSHIPS BETWEEN THE TEMPORALIS WITH REFERENCE TO THE ANTEROLATERAL MUSCLE BUNDLE AND THE FACIAL MUSCLE LAYER

Tomomi SAKAGUCHI-KUMA[1], Keiko FUKINO[1], Kazuo SHIMAZAKi[1], Kumiko YAMAGUCHI[2], Itsuko OKUDA[3], Takashi ONO[1], Keiichi AKITA[2]

[1]Tokyo Medical and Dental University (TMDU), Dept of Orthodontic Sciences, [2]Tokyo Medical and Dental University (TMDU), Dept of Clinical Anatomy, [3]International University of Health and Welfare, Mita Hospital, Dept of Diagnostic Radiology, Japan

The anterior part of the temporalis, especially the anterolateral muscle bundle is situated close to the overlying structures seen in MR and CT images. Although the masticatory function of the temporalis has been generally accepted, functional significance related to the overlying structures has not been discussed. In the present study, we focused the macroscopic and histological examinations of the temporalis and its overlying structures, then we tried to discuss the functional relationships between them… After removal of the skin, the muscle bundle of the orbicularis oculi and the lateral part of the malaris were broadly expanded on the area posterior to the posterior margin of the zygomatic bone. The temporal fascia was generally consisted with the superficial and deep layers, and between these layers were occupied by the fatty tissues. In addition, in the area superior to the upper margin of the orbit, the deep layer was tightly adjoined with the temporalis muscle. The facial muscle layer was expanded on the broader area than the area observed macroanatomically. The layer should be suspended by the fibrous tissues connected with the temporal fascia. Since the temporalis muscle and the facial muscle layer were isolated by the layers of the temporal fascia and the fatty tissue among them, the temporalis muscle might not affect the facial muscle layer. However, the temporalis muscle, especially the anterior region, should have the suspensory function to the facial muscle layer via connecting fibrous tissues. These findings should contribute to the cosmetic and anti-aging medicine.

UNDERSTANDING THE NEUROANATOMY OF THE LARYNX TO THE PRESENT DAY MOVING TOWARDS LARYNGEAL TRANSPLANTATION

José SAÑUDO

Universidad Complutense de Madrid, Departamento de Anatomía y Embriologia Humanas, Facultad de Medicina, Instituto Universitario de Evaluacion sanitaria, Spain

The first laryngeal transplantation was attempted Strome and his team (1998) and though initially meeting with some success the transplanted larynx was removed 14 years later. There are four factors that must be addressed if satisfactory transplantation of the larynx to be achieved: 1) psycho-social and ethico-legal aspects need to be considered; 2) tissue viability vs. rejection must be overcome, 3) restoration of a vascular supply has to be ensured and 4) selective reinnervation of the larynx has to be achieved. The three first factors are being addressed, however the selective

reinnevation remains challenging because the nerve supply of the larynx is now known to be much more complex than many accounts imply. This is because: 1) each laryngeal muscle may receive a variable number of nerve branches, 2) there are multiple connections between the different laryngeal nerves, 3) many laryngeal nerves and connections are mixed in nature conveying both motor and sensory fibres and 4) the laryngeal muscles may receive a dual nerve supply, from both the recurrent laryngeal and superior laryngeal nerves

APPLIMENT OF DIFFERENT CALCULATION FORMULAS OF THEORETICAL WEIGHT IN ORDER TO OBTAIN BODY MASS INDEX BY A STANDARD GENERAL PATTERN

Aida SARAC-HADZIHALILOVIC[1], Amani ELFAKI[2], Senad SLJUKA[3], Izeta AGANOVIC–MUSINOVIC[4], Almira LUINOVIC[5], Bunyamin SAHIN[2]

[1]Medical Faculty Univ. of Sarajevo, Dept of Anatomy, Bosnia and Herzegovina, *[2]Faculty of Medicine, Ondokuz Mayis Univ., Dept of Anatomy, Turkey*, *[3]Faculty of Science, Univ. of Sarajevo, Dept of Biology, Bosnia and Herzegovina*, *[4]Medical faculty, Univ. of Sarajevo, Dept of Immunology, Bosnia and Herzegovina*, *[5]Medical faculty, Univ. of Sarajevo, Dept of Anatomy, Bosnia and Herzegovina*

Aim: The aim of this study was to investigate which is the most acceptable model for body mass index evaluation by a standard general pattern, since the one of the oldest bioantropological issues is what is the mass that a person should have, with a certain height, constitution, gender, age and other important determinants. Methods: This prospective study included 78 patients, male gender, divided into two groups: PTSD - group (44 patients) and control group (34 patients). Those were heterogeneous groups according to age and educational structure, where the 30's and 40's are dominant for age and high school education is dominant for education. Calculations of body mass index were performed using standard general pattern, applying different methodologies to obtain the theoretical mass values (Broca's, Azerad's, American insurance company's, Demelov's) Results: There are significant differences between the average values of body mass index calculated by the general standard pattern, depending on the different kind of calculation of theoretical mass used within the PTSD group and control group. Conclusion: The correlation coefficient indicates that nutritional index obtained by standard general pattern by use of different methodologies for determining a theoretical body mass is very similar for measurment and calculation of nutitinal state within the PTSD and control group. However, compared to correlation matrix we obtained within the PTSD group the coefficients of correlation levels were slightly lower within the control group.

ANALYSIS BLOODSTREAM WHITE RAT TESTIS OF THE EXPERIMENTAL DIABETES

Iryna SAVKA

Danylo Halytskyj National Medical University, Ukraine

Streptozotocin-induced diabetes in rats is frequently used to study the disturbances in lipid metabolism under diabetic conditions. The main complication is a disease of the blood vessels, which we call angiopathy. The researches have been performed on 20 white mature male rats aged 4.5 to 7.5 months with body weight of 130 to 150g. Experimental diabetes modelling was intraperitoneal injection of Streptozotocin ("Sigma", USA), dissolved in 0.1M citrate buffer, pH=4.5 (7mg per 100g of body weight of animals). Animals in whose blood glucose concentration in 2,4,6,8 weeks after launch of experiment was above 13.4 mmol/l were used for research. University Animal Care and Use Committee Approval: № 8 of 18 November 2013. In 2 weeks run of streptozotocin-induced diabetes mellitus in the testicle hemomicrocircular channel links the first signs of angiopathy are found. Venule walls structure is still preserved, but venule lumens are partially dilated. After 4 weeks of experimental diabetes arteriole adventitious coating is also swelling, thickened, with significant amount of amorphous liquid between bundles of collagen fibers... After 8 weeks of streptozotocin-induced diabetes mellitus run we see deep destructive changes in all testicle hemomicrocircular channel links. Diameter of preserved capillaries is 9,93±0,03 μm and 7,47±0,06 μm of longitudinal and latitudinal respectively. Arterioles are dilated, their diameter is 30,56±0,13 μm, twisty, venules are dilated with diameter of 31,92±0,04 μm. The morphological and morphometric analysis of testicle angioarchitecture allowed evaluating its vascularization state in the norm and in streptozotocininduced diabetes mellitus…

ANTHROPOLOGICAL AND PALEOPATHOLOGICAL ANALYSIS OF TWO DIFFERENT POPULATIONS OF SARDINIA IN PRENURAGIC AND ROMAN PERIOD

Rita M. SERRA[1], Veronica I. CASU[1], Erika CHESSA[1], Mariangela MELONI[1], Alessandra LA FRAGOLA[2], Daniela ROVINA[2], Valeria POMPONI[1], PasqualeBANDIERA[1,3], Vittorio MAZZARELLO[3,1]

[1]University of Sassari, Dept of Biomedical Sciences, [2]Superintendence for Archaeological Heritage for the provinces of Sassari and Nuoro, [3]Center for Anthropological, Paleopathological and Historical Studies of the Sardinian and Mediterranean populations, Dept of Biomedical Sciences, University of Sassari, Italy

The purpose of the present study was to evaluate and compare two different archaeological sites located in the North-West of Sardinia, Italy. The first place was a Domus de Janas, named S'adde 'e Asile, located in Ossi (Sassari's province), datable around 1700 BC. The second site was a necropolis with "cappuccina" burials, appointed as Monte Carru, in Alghero (Sassari's province), dated back to the Roman Imperial age (around 350 AC). The examined burials were subjected to washing with water and to restoration through gluing with PVA glue, wherever possible, and only then we were able to proceed with the anthropological study… Heights decreased from an average of 168 cm to 162 cm in prenuragic and Roman period respectively: specially, the mean height for females was of 158cm in Monte Carru. Diseases were present in both periods: the most common diseases were joint disorders such as osteophytosis and osteolysis, localized mainly in upper limbs and spine of Monte Carru individuals while in lower limbs of S'adde 'e Asile subjects. Dental pathologies were tartar and caries and hypoplasia in S'adde 'e Asile and Monte Carru respectively, Dental wear was found on lower molars in both samples, but with a greater rate in prenuragic sample. Despite a greater number of deaths in childhood, the general state of health was better in the prenuragic period; we can assume a different feeding in Roman times, with a larger percentage of carbohydrates, proven by a higher percentage of caries.

VISUALIZATION OF VASCULAR SUPPLY OF THE PALATAL MUCOSA IS A USEFUL TOOL IN FLAP DESIGN (REVIEW)

Arvin SHAHBAZI[1,2], Grimm ANDRÁS[1], Baksa GÁBOR[1], Gerber GÁBOR[1], Balint MOLNAR[2], Andrea D. SZÉKELY, Péter WINDISCH[2]

[1]Semmelweis University, Dept of Anatomy, Histology and Embryology, Faculty of Medicine, [2] Semmelweis University, Dept of Periodontology, Faculty of Dentistry, Hungary

The palate is richly supplied by the branches of maxillary and facial arteries. The posterior part of the palate is supplied by the tributaries of the descending palatine artery and the anterior pre-maxillary part is supplied by the branches of facial and nasopalatine arteries…Since the primary purpose of the vascular system is to deliver sufficient amount of nutrients and oxygen to supply the tissue, it is critical to prevent the impairment of blood circulation during surgical intervention. The aim of this paper is to review and demonstrate the course of arteries by summarizing different approaches described in the literature. Methyl methacrylate, latex milk or an India ink / formalin mixture is injected in the vessels of unfixed and flushed specimens. Latex milk and corrosion casts are preferred for macroscopical observations,

however, India ink injections are mainly used for microscopical analyses due to the excellent diffusion of the latter into the mucosa. Numerous anastomoses, formed between the greater, lesser and ascending palatine arteries, were recorded both at the macroscopical and microscopical levels… It is worth noting that in edentulous patients no anastomoses were detected, but rather, an avascular zone was apparent at the alveolar ridges. Midcrestal incisions are suggested for ridge augmentation and sinus floor elevation in edentulous patients due to the presence of an avascular zone. In the case of dentate patients, a marginal or paramarginal approach will have to be considered.

POSTERIOR ATROPHIC MANDIBULAR BONE APPLIED ANATOMY

Hossein SHAHOON
Shahed University, Oral and Maxillofacial Department, Iran

Low height of bone above inferior alveolar canal (IAC) were confiner from kinds of oral surgery. The aim of current study were to introduced novel approach for placement of implants without need for bone augmentation and nerve repositioning from use of regular or narrow implants placed in buccal aspect of inferior alveolar canal. Methods: Fifty patients with bone height less than 6mm above the inferior alveolar canal (IAC) were selected. In the every sextant, two one piece or regular implants inserted in space of lateral (IAC). Results: Three years follow up period was done for 80 implants. There were no surgical and early failure or prosthetic complication. The mean value of marginal bone loss around 80 implants were 1.9mm and 2.3mm for anterior implants respectively. Conclusion: Usually about 60% to 70% cases, Infra alveolar Neurovascular Bundle Attached or very closed to lingual wall and nerve injury and future disturbances in the oral surgery is low and Mandibular atrophic bone with adequate width could be treated with narrow or regular implants, regarding that implant placement in lateral aspect of IAC were sensitive technique.

STERNBERG'S CANAL INCIDENCE, MORPHOLOGY AND CORRELATION WITH SPHENOID SINUS TYPE

Nikola ŠTOKOVIĆ[1], Ivo DUMIĆ-ČULE[1], Vladimir TRKULJA[2], Ivana ČUKOVIĆ-BAGIĆ[3], Tomislav LAUC[4], Lovorka GRGUREVIĆ[1]
[1]Laboratory for Mineralized Tissues, Center for Translational and Clinical Research, School of Medicine, University of Zagreb, [2]Department of Pharmacology, School of Medicine, University of Zagreb, [3]Department of Paediatric and Preventive Dentistry, School of Dental Medicine, University of Zagreb, [4]Department of Anthropology, Faculty of Social Sciences and Humanities, University of Zagreb, Croatia

Sternberg'canal (lateral craniopharyngeal canal) is a small canal connecting middle cranial fossa and nasopharynx. Canal can be seen in individuals aged 6 or less and is typically closed until the age of 10. However, in some individuals it may persist patent during whole life. Canal is located in the frontal plane medially to the foramen rotundum and has intracranial and extracranial opening. Intracranial opening is medial to the superior orbital fissure; extracranial opening is at the level of vaginal process. Our goal was to investigate the incidence and dimensions of Sternberg's canal and to investigate whether there is a correlation between the sinus type and the incidence of Sternberg's canal. 103 adult skulls were analysed using CBCT device. Sternberg's canal was detected on coronal plane images. We measured the distance between left and right intracranial (I-I) and extracranial (E-E) openings and the distance between intracranial and extracranial (I-E) openings. On sagittal plane images we determined sinus type (conchal, presellar, sellar or postsellar). Results: The canal was present in 17.5% of cases, while a part of the canal in 8.7% of cases. 94.4% of the canals were two-sided and 5.6% of the canals were present only on one side. The prevalence of sinus types was 1% conchal, 19,9% presellar, 45,6% sellar and 33,5% postsellar. The canal was present in 100% conchal, 41.5% presellar, 13.8% sellar and 5.8% postsellar type sinuses. The mean I-I distance was 23,4 mm, mean E-E distance was 10,4 mm and mean I-E distance was 15,4 mm.

TOPOGRAPHY OF CONDUCTION SYSTEM WITH COMPLEX TYPES OF CONGENITAL HEART DEFECTS

Galina SPIRINA
Ural State Medical Univ., Dept of Human Anatomy, Russia

The aim of this work is to determine the topography of the atrioventricular (AV) node, the AV bundle and its branches in reference to complex types of congenital heart defects (CHD). The material included 44 heart specimens of newborn and nursing infants with complex types of CHD (complete atrioventricular canal defect, tetralogy of Fallot, atrioventricular septum defect concomitant with common arterial trunk)… The highest degree of its deformity (CAVC defect) corresponds to the longest bundle up to anatomical bifurcation. The ventricular portion of the bundle is located on the left side of the muscular ridge of the IVS sinus portion at an angle of 60° to the horizontal… The AV node is located at the base of the posterior wall of the right atrium or the posterior section of the right side of the interatrial septum base. In case of tetralogy of Fallot, the AV node is located in front of the coronary sinus opening. In case of type 2 defect, the ventricular portion of the AV bundle is located on the left side of the muscular ridge of the IVS sinus portion…The left branch of the bundle has long narrow nonbranching part, which divides into three branches. Modification of position of the AV node, ventricular portion of the AV bundle, its anatomical bifurcation with complex types of CHD reflect the degree of abnormal development of IVS portions. The pronounced deformity of the sinus portion corresponds to the longest AV bundle up to the anatomical bifurcation.

COCHLEA-CAROTID CANAL RELATIONSHIP AND CAROTID-COCHLEAR INTERVAL (CCI)

Nikola ŠTOKOVIĆ[1], Ivo DUMIĆ-ČULE[1], Vladimir TRKULJA[2], Tomislav LAUC[3], Ivana ČUKOVIĆ-BAGIĆ[4], Lovorka GRGUREVIĆ[1]
[1]Laboratory for Mineralized Tissues, Center for Translational and Clinical Research, School of Medicine, University of Zagreb, [2]Department of Pharmacology, School of Medicine, University of Zagreb, [3]Department of Anthropology, Faculty of Social Sciences and Humanities, University of Zagreb, [4]Department of Paediatric and Preventive Dentistry, School of Dental Medicine, University of Zagreb, Croatia

Carotid canal and the cochlea are located in the petrous part of the temporal bone in extremely close relationship. The aim of our study was to investigate position of the carotid canal in relation to the cochlea, values of carotid-cochear interval (CCI, minimum distance between carotid canal and cochlea) and impact of carotid canal position to the values of CCI. 102 skulls (204 sides – left and right) were recorded using CBCT (Cone Beam Computed Tomography) device Soredex Scanora3D. Relationship between cochlea and carotid canal was evaluated on axial plane images. Relationships between cochlea and carotid canal were assigned into 4 categories: A – lateral canal wall is anteromedial to the basal turn of the cochlea; B – lateral canal wall is anterior to the basal turn of the cochlea; C – lateral canal wall is anterior to the middle turn of cochlea; D – lateral canal wall is anterior to the cupula. Carotid cochlear interval (CCI) was measured in axial and sagittal plane. Relations between carotid canal and cochlea were shown as extremely variable. Variability is encompassing both, carotid canal position relative to the cochlea and CCI. Our results showed that there is a correlation between the type of relations and CCI; CCI values significantly decrease from type A to type D. Relationship between carotid canal and cochlea has extensive clinical significance during the implantation of cochlear implants to prevent penetration of the carotid canal during cochlear implant surgery. Moreover, small CCI can be associated with hearing loss.

THE SURGICAL IMPORTANCE OF MECKEL'S DIVERTICULUM

Claudia STOICA[1], Nicolae BACALBASA[2], Radu COSTIN[3], Ileana GIUVARASTEANU[4]

[1]University of Medicine and Pharmacy "Carol Davila", Anatomy- Clinical Anatomy and Surgical Techniques Dep¿t, [2]University of Medicine and Pharmacy "Carol Davila", Obstetrics and Gynecology, Clinical Hospital Cantacuzino, [3]County Hospital Ilfov, General Surgery Dept, [4]University of Medicine and Pharmacy "Carol Davila", Anatomy- Clinical Anatomy and Surgical Techniques, Romania

Meckel's diverticulum represents a vestigial remnant of the vitelline duct that is present in 2-4% of population. An ileal loop with Meckel's diverticulum may be present inside of a hernia sac, the so-called Littre hernia which may be located in various sites: inguinal, femoral or umbilical regions. All of these positions of the diverticulum can cause complications such as ulceration, hemorrhage, intestinal obstruction, perforation and tumor development. For these reasons the only treatment solution remains the surgical approach - diverticulectomy - even if the Meckel's diverticulum is asymptomatic and is found incidentally, intraoperatively. We present intraoperative images from two patients with Meckel's diverticulum, one of them with atypical location (Littre hernia) associated with a neuroendocrine tumor which is a rare finding, and the other case with incisional hernia with atypical obstruction caused by a phytobezoar. In both cases the diverticulum was located on the mesenteric side. The treatment consisted of resection of the intestinal loop with Meckel's diverticulum complementary to herniorraphy according to Lichtenstein tension-free mesh repair technique and incisional herniorraphy, respectively…The knowledge of embryological and anatomical characteristics of Meckel's diverticulum is useful to understand its possible evolution in order to avoid the complications that can appear due to its natural evolution, and which require the surgical approach as the only treatment solution. Usually, the Meckel's diverticulum is incidentally discovered during surgical laparotomy and for this reason a systematic exploration of the abdomen is mandatory.

DESCRIPTION AND NEUROCHEMICAL CHARACTERIZATION OF THE AUTONOMIC PATHWAYS INNERVATING THE LOWER GINGIVA AND LIP

Enikő SZABÓ[1], Katalin KÖVES[2], Zsolt BOLDOGKŐI[3], Ágnes CSÁKI[2], Zsolt LOHINAI[4], Zsuzsanna TÓTH[4], Philippe CIOFI[5]

[1]Semmelweis Univ., Dept of Conservative Dentistry, Hungary, [2]Fac. of Medicine, Semmelweis Univ., Dept of Anatomy, Histology and Embryology, Hungary, [3]Fac. of Medicine, Univ. of Szeged, Dept of Medical Biology, Hungary, [4]Fac. of Dentistry, Semmelweis Univ., Dept of Conservative Dentistry, Hungary, [5]Neurocentre Magendie, INSERM U862, France

Our goals were 1) to describe the central pathways regulating sympathetic and parasympathetic functions, 2) to examine the distribution of central premotor neurons on both sides, 3) to further clarify which parasympathetic ganglion sends postganglionic fibers to the lower gingiva and lip and 4) to identify the neurochemical nature of the members of these descending pathways. Retrogradely spreading green fluorescence protein labeled virus was injected into the lower gingiva or lip of Wistar rats. In both intact and sympathectomized rats, virus labelled neurons of the hypothalamic paraventricular nucleus showed oxytocin, vasopressin, but not cholecystokinin (CCK) and corticotropic hormone releasing hormone (CRH) immunoreactivities…It was also found that all the three cervical sympathetic ganglia send fibers to the lower gingiva and lip. We also certified that the gingiva receives parasympathetic innervation and that it derives from the otic ganglion, the lip receives parasympathetic innervation from both the otic and submandibular ganglia. In intact and sympathectomized rats the members of the descending pathways were further characterized. Conclusion: Our paper demonstrates for the first time that oxytocin, vasopressin and orexin, but not CCK and CRH, immunoreactive hypothalamic neurons may influence both sympathetic and parasympathetic responses of the lower gingiva and lip. These are common command neurons. We also summarized the data step-by-step on the chemical characteristics of the lower part of both the sympathetic and parasympathetic descending pathways of both the lower gingiva and lip.

SEROTONERGIC INNERVATION AND CONNECTIVITY OF THE AVIAN VENTRAL TEGMENTAL AREA

Andrea D SZÉKELY, András CSILLAG, János HANICS, Catherine H MONTAGNESE

Semmelweis University, Dept of Anatomy, Histology and Embryology, Faculty of Medicine, Hungary

The area ventralis tegmentalis of Tsai (VTA), a midbrain monoaminergic cell group, is thought to play a role in memory formation, aversive/ addictive behaviours while representing an essential link within the brain reward cycle. In mammals, the VTA and the raphe nuclei, together with the nucleus accumbens, are considered to be the main subcortical relays of the brain reward circuit, all possessing reciprocal connections with the medial prefrontal cortex, mPFC. In birds, the rostral Wulst, on the basis of its connectivity and neuronal composition, is thought to be homologous to a part of the mammalian ventromedial PFC…The avian VTA contains only two subregions (shell and core) while the mammalian homologue may be subdivided into several subregions. There is a mainly ipsilateral neuronal loop connecting the VTA to the rostral Wulst, adding to the collection of telencephalic pallial regions, thought to be equivalent to certain specific regions of the mammalian mPFC, including the anterior cingulate, infralimbic and prelimbic cortices. A reciprocal connection was verified between the VTA and the nucl. linearis caudalis, a mesopontine serotonergic nuclear complex, thought to be homologous to the midbrain raphe nuclei. We described the distribution of serotonergic axons forming baskets around dopaminergic or unlabelled principal cells of VTA. Furthermore, we detected an unusual, in mammals yet unidentified, group of small, fusiform, serotonergic neurons within the caudolateral aspect of the nucleus. We found 5HT labelled terminal varicosities containing round synaptic vesicles in contact with small and medium size dendritic profiles of, presumably, principal cells of VTA. The boutons seemed to predominantly form asymmetrical synapses, however, in some cases, long appositions lacking recognised densities were also observed. Furthermore, we are the first to describe the presence of glomerular synapses within the VTA.

EXAMINATION OF BIOACTIVE FACTORS IN DIFFERENT FRACTIONS OF HUMAN MILK SAMPLES

Andrea TAMÁS[1], Anna VASS RÉKA[1], Beata POLGAR[2], Agnes KEMENY[3], Judit GYARMATI[4], Tibor ERTL[4], Peter TAMAS[4], Zsuzsanna HELYES[3], Ibolya TARCAI[5], Dora REGLODI[1]

[1]University of Pécs, Dept of Anatomy, [2]University of Pécs, Medical Microbiology and Immunology, [3]University of Pécs, Pharmacology and Pharmacotherapy, Janos Szentagothai Research Center, [4]University of Pécs, Obstetrics and Gynaecology, [5]Unified Health Institutions, Hungary

Breast milk contains several bioactive compounds implicated in the development of the nervous system and in gaining immuncompetence. PACAP is a neuropeptide with important functions in reproductive and developmental processes. Recently, we have shown that high levels of PACAP was present in breast milk and described changes of PACAP levels during the first 17 months of lactation. In the first experiment we examinedthe presence of bioactive factors (Fractalkine, MIP-1β, Eotaxin, MDC, RANTES, EGF, MCP-1, GRO, Flt-3L, CD40) both in the water and lipid phases of samples during the first 6 months of lactation with Luminex technique. Then PACAP content was measured in different milk samplefractions of mothers with mature and premature newborns with ELISA method. Five ml milk was collected monthly during the first 6 months of nursing from mothers with

mature babies and during the first 3 months from mothers with premature babies. The samples were separated to lipid and water phases by centrifugation. We used ultrasonication to factor the lipid phase. With this method we obtained an additional lipid fraction and water fraction. We measured the bioactive factors with Luminex technique and PACAP level with ELISA method. All of the measured bioactive factors were detected in all fractions of the samples. We were the first who showed the presence of Fractalkine, MDC, Flt-3L in different phases of milk samples. A significantly higher bioactive factor concentration was apparent in the water phase compared to the lipid phase with a significantly higher concentration of EGF and GRO when compared to other bioactive factors… Using ELISA, we showed higher PACAP concentration in the lipid fraction compared to water phase with significant alterations in milk samples from mothers with premature babies compared to mature milk samples… Suppoted by: OTKA K104984, Bolyai Scholarship, PTE-MTA „Lendulet" Program, Hungarian Brain Research Program - Grant No. KTIA_13_NAP-A-III/5.

STANDARDIZATION OF STERNOCLEIDOMASTOID FOR BOTULINUM TOXIN APPLICATIONS

Bilge İ. TORUN[1], S KENDIR[2], A UZ[2]
[1]Ankara Yildirim Beyazit Univ. Faculty of Medicine, Anatomy, [2]Ankara Univ., Faculty of Medicine, Dept of Anatomy, Turkey

Aim: Botulinum Toxin is frequently applied to sterno-cleidomastoid for torticollis treatment. During this application, bulb of jugular vein under sternocleidomastoid makes the interventions dangerous. Also injecting botulinum toxin into the infrahyoid muscles which lie under sternocleidomastoid may cause hoarseness and swallowing disorders. In this study, it was aimed to measure the thickness of sterno-cleidomastoid and so to make the botulinum toxin application safely without injuring any vascular structures or neighboring muscles. Methods: In 10 male cadavers, sternocleidomastoid was evaluated in three equal segments (upper, middle and lower). The muscle width and thicknesses at the center of each segment were measured. In 1 male cadaver colored latex was injected into the center of every part of the muscle according to the measurements. Results: The respective mean width of upper, medial and lower segments were 33,15 (23 - 41) mm, 36,45 (28 - 45) mm and, 39,35 (15 - 50) mm. The respective mean thicknesses of upper, medial and lower segments were 5,29 (3,87 – 7,68) mm, 5,89 (3,56 – 8,32) mm and 3,60 (0,69 – 7,75) mm. There was no significant difference between sides. The thickest part of the muscle was the middle part while the lower part was the thinnest one. When the coloured latex injected cadaver were dissected it was seen that center of every segment of the muscle was dyed while the neighboring structures were avoided. Conclusion: Knowing the thicknesses of the upper, middle and lower segments of sternocleidomastoid will make the Botulinum Toxin applications to this muscle safer and easier.

MENISCOIDS IN THE SHOULDER JOINT

Trifon TOTLIS, Konstantinos NATSIS
Laboratory of Anatomy, Faculty of Medicine, School of Health Sciences, Aristotle University of Thessaloniki, Greece

Synovial joints may be divided by fibrocartilaginous articular discs into separate spaces. These structures are attached to the fibrous capsule. Articular discs may completely separate two joint compartments, such as the temporomandibular joint or partly separate a synovial joint such as the menisci of the knee. Synovial meniscoid folds represent fibroadipose projections of the joint capsule into the joint space and they have been described in various joints of human body. There are reports of such folds in zygoapoficial and atlanto-occipital joints in cerebral spine as well as in metacarpophalangeal and also radiohumeral joint. Glenoid labrum meniscoid folds are considered to be a normal anatomic variant of the shoulder joint which has been only scarcely described in the literature…We conducted an arthroscopic study to investigate the incidence and location of labral meniscoid folds… According to our study, the incidence of labral meniscoid folds in shoulder joint is 62.7%. They are located more often at an anterosuperior position of shoulder joints and their incidence tends to be higher in older patients while in male ones they are located in a more anterior position in comparison to female patients where they are located more superiorly. This finding may indicate that meniscoid folds are probably acquired and contribute to anterior stability of the shoulder joint. Further research is necessary to evaluate more thoroughly the functional significance of meniscoid folds and to investigate any possible impact on the pathophysiology of a painful shoulder.

APLASIA OF THE RIGHT VERTEBRAL ARTERY: AN INCIDENTAL AUTOPSY FINDING AND ITS POINTED SIGNIFICANCE IN CLINICAL PRACTICE

Milena M TRANDAFILOVIĆ, Ljiljana P VASOVIĆ, Slobodan R VLAJKOVIĆ
Faculty of Medicine, Univ. of Niš, Dept of Anatomy, Serbia

… Case reports of the right VA aplasia from online available articles and library archives at the Faculty of Medicine of Niš dated from year 1968 to 2016 have been examined. This abnormality in 59 cases - patients and cadavers of (un)known gender that were investigated in different countries have been reviewed. General and special characteristics of these cases were as follows: 1) Aplasia of the right VA was discovered in patients or cadavers aging from day 14 to year 79; 2) the right VA was entirely absent in 96.6% of cases; 3) aplasia of the right VA was presented in 52.5%, and associated with aplasia of the left VA in 47.4% of cases; 4) simultaneous aplasia of other seven different arteries were found in 30.5% of cases; 5) various primitive carotid-vertebrobasilar anastomoses (CVBAs) persisted in 89.8% of cases; 6) an absence of CVBA in only 7/31 cases of single right VA aplasia; and 7) persistence of the primitive hypoglossal artery is more frequent in cases of single right VA, while persistence of the primitive proatlantal intersegmental artery is more frequent in cases of aplasia of both VAs. Angiographically documented stenosis of one or more arteries of the carotid system (30.5%), as well as the presence of single or multiple aneurysms (23.7%) characterized cases of the right VA aplasia. Presented cases of the right VA aplasia inspire the author to investigate and compare morphological status and associated abnormalities in cases of the left VA aplasia with previous ones.

DNA SEPARATION FROM DENTAL TISSUES

Jovanka TRIFUNOVIC[1], Momcilo RISTANOVIC[1], Vladimir BIOCANIN[2]
[1]Medical Faculty, [2]Faculty of Pharmacy and Health, Travnik, BiH, Serbia

The first use DNA in criminal cases is the geneticist Alex Jeffreys in the United Kingdom in 1984…Numerous biological traces remain at the crime scene. They come from the person who committed the crime and allow for the DNA identification to be performed. DNA is an organic substance in the nuclei of living cells. DNA is a component part of the chromosome and consists of four bases. The essence is in the arrangement, that is, the establishment of the sequence of these bases. Thanks to the DNA method numerous comlicated cases were solved, especially rapes and murders, and especially war cases, when we investigate corpses and remains of human bodies – bones and other. There are some reasons to use teeth as source for DNA. DNA is more stable and conserved in the tooth, since all the agents that endeavour to break it are prevented from it due to the barrier provided by enamel, the dentine and the dental cement. Also, during a lasting contact of the skeleton with various media (earth, water, fire,...). DNA is destroyed or damaged and is difficult to separate from the bone tissue because the tissue is porous. It is not only by the shape, size and position of human teeth that gender is identified, the latest research have proven the presence of protein amelogenin (AMEL) in human enamel. Very small amounts of DNA are well protected inside the tooth; within the

sclerosed dentinal tubules, which are sealed from external influences

APPLICABILITY OF A SEMIQUANTITATIVE EVALUATION OF THE INTERCONDYLAR FOSSA

Katrin TSCHEMATSCHAR[1], Franz KAINBERGER[2], Lena HIRTLER1

[1]Medical University of Vienna, Center for Anatomy and Cellbiology, Dept of Anatomy, [2]Medical University of Vienna, Dept of Radiology and Image Guided Therapy, Austria

The intercondylar notch (IN) can differ in morphology and size. Several studies discuss a narrow notch width as a risk for tears of the anterior cruciate ligament (ACL). However not only the size of the IN but also the shape influences the ACL. Another consequence of reduced space in the IN is impingement of the ACL and the posterior cruciate ligament (PCL). Particularly osteoarthritis of the knee and mucoid hypertrophy of the ACL can cause impingements…The applicability of just visual classification of the notch in clinical practice was investigated. Measurements were performed in 326 patients (6 groups of age). Three shapes of IN were defined. IN size was evaluated in the coronal plane of MRI scans…The Ω-shape was most frequent (n=183, 55,5%),then the inverse-U-shape(n= 100, 30,3%) and least frequent was the A-shape (n=43, 13,0%). In semiquantitative evaluation the Ω-shape was most frequent (n=249, 75,5%) with the A-shape being second (n=44, 13,3%) and inverse-U-shape least (n=37, 11,2%). In semiquantitative evaluation with the visual supporting tool 183 patients (55,5%) were classified as Ω-shaped, 103 patients (31,2%) as inverse-U-shaped and 44 patients (13,3%) as A-shaped. Due to moderate agreement between the results of measurements and semiquantitative evaluation and also due to poor agreement between the results of three independent raters, accuracy can not be proven. Between the measurements and semiquantitative evaluation with the visual supporting tool very good agreement was achieved. So accuracy of the semi-quantitative evaluation with the visual supporting tool can be proven.

COMPARISON OF TRADITIONAL VERSUS COMPUTER BASED ANATOMICAL EDUCATION: INFLUENCE OF SPATIAL ABILITY ON LEARNING OUTCOMES

Sonya E VAN NULAND., Kem A. ROGERS

University of Western Ontario, Anatomy and Cell Biology, Canada

Growing class sizes and a reduction in laboratory hours have increased the popularity of commercial anatomy e-learning tools… When students with low spatial ability studied anatomical content with the more complex tool (Netter's 3D Interactive Anatomy), their performance scores were significantly lower than those students with high spatial ability (p=0.007, R2=0.103)… The questions remain regarding how these e-learning tools compare to more traditional learning processes, such as physically manipulating a skeleton. Using a novel dual-task methodology with a cross over design, undergraduate anatomy students…(n=75) were evaluated as they studied a bony joint using a physical skeleton as well as a simple commercial software program (A.D.A.M. Interactive Anatomy). We hypothesized that the acquisition of anatomical knowledge by students, regardless of their spatial ability, will be superior when learning is associated with a real model, rather than currently available e-learning tools… Results suggested that while students may experience more cognitive load while studying using a physical skeleton, it does not detrimentally impact their performance; in fact student performance was significantly higher when they studied using the skeleton. Furthermore our results also demonstrated that students with low spatial ability are at a significant disadvantage when they learn the bony anatomy of a joint and are tested on images of the contralateral joint. This study highlights a major weakness in the strategy to move traditional anatomical education online, and suggests that we should be teaching both anatomy and surgical procedures on both sides of the human body….

"MEMORIX HISTOLOGY" - 9 WAYS OF LEARNING HISTOLOGY FROM A SINGLE BOOK

Ivan VARGA[1], Ján BALKO[2], Zbynek TONAR[3], David KACHLIK[4], Radovan HUDÁK[4]

[1]Comenius Univ. in Bratislava, Faculty of Medicine, Institute of Histology and Embryology, Slovakia, [2]Dep. of Pathology and Molecular Medicine, Second Faculty of Medicine, Charles Univ. in Prague, Czech Republic, [3]Dep. of Histology and Embryology, Faculty of Medicine in Pilsen, Charles Univ. in Prague, Czech Republic, [4]Dep. of Anatomy, Second Faculty of Medicine, Charles Univ., Prague, Czech Republic

"If you can't explain it simply, you don't understand it well enough". (Albert Einstein) We are living in an age of rapid increase of information, which places escalating demands on students who are under the pressure of incredible progresses in biomedical sciences. It is thus vitally important from the student's point of view to choose and absorb the most essential information, as well as to retain information relevant for their future medical careers. It is also important that information is presented in understandable and student-friendly manner. The goal of our new textbook "Memorix Histologie" (Memorix Histology, firstly in Czech language) is to teach histology in a way that will prepare students for their future medical careers, keep them motivated and support memory consolidation so that they can recall their knowledge of microscopic anatomy easily…1) Continuous text as a part of introduction of each chapter 2) Text in paragraphs, for fast learning and better transparency of important terms 3) Interesting facts – increase interest 4) Clinical notes and applications 5) Schematic drawing –drawings are the most significant and convincing part 6) Representative microphoto-graphs and electron-microphotographs 7) Decision algorithm ("tree") 8) Tables and schemes 9) Questions and figures for repetition… Finally, all the important histological facts and principles supplemented by functional, developmental and clinical correlations are covered in this 560-page text, supported by more than 1000 simple illustrative schematic drawing, and more than 200 microphotographs, electron micrographs, tables and algorithms how to describe histological slides…

LATEST NEWS IN MICROSCOPIC ANATOMY OF THE HUMAN UTERINE TUBE

Ivan VARGA[1], Michal MIKO[1], Marianna KAJANOVÁ[2], Ladislav URBAN[2], Stefan POLÁK[1]

[1]Comenius Univ. in Bratislava, Faculty of Medicine, Institute of Histology and Embryology, [2]Dept of Gynaecology and Obstetrics, ForLife General Hospital in Komárno, Slovakia

Thanks to huge advances in the field of microscopic technique there prevails a notion in the general public, but probably also in the scientific community that currently it is not possible to discover a novel organ, tissue or cell in the human body…Surprising discovery over the last decade have been findings that in the organs of the female reproductive system, and as well in other parts of the human body, there are located previously unrecognized cells – telocytes - with extremely long cytoplasmic processes. Telocytes are localized in a muscular layer, but they are also part of connective tissue of the mucosa and are likely responsible for coordination of the smooth muscle activity in the uterine tubes…Just below the mesothelium of tunica serosa and adjacent board ligament we can find often small clusters of epithelial cells called Walthard cell nests (according to their discoverer, a Swiss gynecologist Max Walthard who provided a comprehensive description of them in 1903). Microsc-opically, they are composed of polygonal epithelium-like cells and may occasionally be cystic and reach 2 – 3 mm in size. These epithelial cell-clusters are probably derived from the mesothelium by invagination, and are often neglected in recent histology textbooks.

ALGOMETRY TESTING IN WOMEN WITH LUMBAR RADICULOPATHY

Nikola VUČINIĆ[1], Mirela ERIĆ[1], Snežana TOMAŠEVIĆ-TODOROVIĆ[2], Mirjana SAVIĆ[2], Dušica MARIĆ[1]
[1]Dept of Anatomy, Fac. of Medicine, Univ. of Novi Sad, [2]Dept of Physical Medicine and Rehabilitation, Univ. of Novi Sad, Clinic for Medical Rehabilitation, Clinical Center of Vojvodina, Novi Sad, Serbia

Algometry, as quantitative sensory testing, is seeing increased use in clinical practice and the prevalence of musculosceletal pain is found to be higher among women. The aim of this study was to compare pressure pain threshold (PPT) in trigger points on the left and on the right side of low back region in lumbar radiculopathy. Thirty women hospitalized with lumbar radiculopathy and verified by magnetic resonance imaging (MRI) was included in our study. Pressure pain threshold was measured at five points bilaterally, at the beginning and at the end of hospitalization (treatment lasted an average of 2 weeks), using an electronic pressure algometer. On the left side of low back region average PPT was 31.42 N/cm² (at the beginning of hospitilization) and 36.20 N/cm² (at the end of hospitalization) in range of 0 to 59.40 N/cm². On the right side of low back region average PPT was 31.77 N/cm² (at the beginning of hospitilization) and 36.06 N/cm² (at the end of hospitalization) in range of 0 to 59.15 N/cm². The results showed that the pain in patients was reduced after treatment, and that there was no significant difference in PPT values before and after treatment between the left and right side. Algometric examination in patients with lumbal radiculopathy serve as a reference for clinical diagnosis of abnormal tenderness and may be useful as part of a protocol to evaluate clinical change (improving or worsening as a result of certain treatment).

SUPERFICIAL INNERVATION OF THE DISTAL FOREARM AND THE HAND - DANGER ZONES IN SURGERY

Vincent WLODEK, Lena HIRTLER
Medical University of Vienna, Center for Anatomy and Cellbiology, Department of Anatomy, Austria

Aberrant or inconstant branches of cutaneous nerves of the forearm can often cause problems for surgical approaches for multiple surgical procedures in this area. The aim of this thesis was to investigate the course of the lateral, medial and posterior antebrachial cutaneous nerves, the superficial branch of the radial nerve, the dorsal branch of the ulnar nerve and the palmar branches of the median and ulnar nerve and to determine their relationship to osseous and tendinous landmarks, in order to define danger zones. The cutaneous nerves were dissected on 20 formalin – embalmed cadaver forearms and hands. Standardized fotographies were taken and the position and distribution of the nerves and landmarks were measured digitally at pre-determined positions. A statistical analysis was carried out and the danger zones were defined… The anatomic snuffbox and the ulnar aspect of the wrist were considered to be not safe, because of the wide distribution of nerves. The presented method allowed the registration and description of normal and aberrant courses of cutaneous nerves. Danger zones for surgical approaches were defined, which should help minimizing iatrogenic nerve injury.

SINGING AND SEX

J Martin WILD
Univ. of Auckland, Anatomy and Med. Imaging, New Zealand

According to Holstege and Subramanian (2015), the generation of speech involves two different motor systems, emotional and volitional. Essential for the expression of emotions such as crying and laughter, screaming and yelling, is the periaqueductal grey (PAG). This centre receives descending inputs from the anterior cingulate, insula and orbitofrontal cortices, and has multiple descending projections throughout the medulla, but only one of which – to the nucleus retroambiguus – provides for direct access to the motoneurons innervating muscles involved in vocalization, namely those of the soft palate, pharynx and larynx, and those of the thoracic and abdominal cavities for the production of appropriate subglottal pressure via modulated respiration. The volitional aspects of speech involve the modulation of vocalization by the motor cortex and its corticobulbar projections to muscles of the face, mouth, tongue, larynx and pharynx. Many non-human animals also express emotions via their vocalizations, birds in particular, which comprise the major vocal animal group other than ourselves. It is of significant comparative interest, therefore, to determine whether birds generate their vocalizations using similar parts and pathways of the brain as we do. This talk will briefly survey some of the functional neuroanatomy relevant to this enquiry, particularly with respect to the songbirds, which, like ourselves, generally learn their songs from parental tutors. An interesting, non-intuitive aspect of the bird-mammal comparison is that nucleus retroambiguus in both birds and mammals projects not only upon motoneurons involved in vocalization, but also upon motoneurons involved in sexual behaviour. Some thoughts about why and how singing and sex come to be anatomically linked will be vocally expressed.

ANATOMICAL RELATIONSHIPS BETWEEN ABDUCENS NERVE AND INTERNAL CAROTID PLEXUS

Grzegorz WYSIADECKI[1], Piotr BRZEZIŃSKI[2], Michał POLGUJ[3], Łukasz OLEWNIK[1], Mirosław TOPOL[1]
[1]Medical Univ. of Lodz, Dept of Normal and Clinical Anatomy, [2]Medical Univ. of Lodz, Dept of Cytophysiology, Histology and Embryology, [3]Medical Univ. of Lodz, Dept of Angiology, Poland

The abducens nerve (CN VI) may be involved in pathological processes within the cavernous sinus. Sometimes CN VI palsy may be accompanied by Horner syndrome. However, anatomical variations of communications between CN VI and the internal carotid plexus have not yet been exhaustively described. The aim of the study was analysing possible variations of these communications. Twenty-five randomly selected head specimens fixed in a 10% formalin solution were studied (50 abducens nerves). Additionally, five specimens underwent histological evaluation with H&E staining, as well as silver staining. In all the specimens, communications between CN VI and the internal carotid plexus were macroscopically visible… In the cases where CN VI split into branches in CS, the communications appeared in the area where CN VI branched out at a short length into several filaments, merging into a single trunk in its further course. When CN VI was partially duplicated (10% of cases), communicating branches from the internal carotid plexus joined CN VI in the area where both trunks of the duplicated CN VI merged within CS. Histological examination of the communicating branches revealed small nerves containing mainly unmyelinated axons. Conclusion The study allowed to observe constant communications between CN VI and the internal carotid plexus located in the area where the cavernous segment of CN VI adhered to the ascending part of the internal carotid artery.

COMPARISON OF CORMACK AND LEHANE'S GRADE WITH ANTHROPOMETRIC MEASUREMENTS

ElifM. YILMAZ[1], Gulnur OZTURK[2], Ali YILMAZ[3]
[1]Edirne Sultan I Murat Devlet Hastanesi, Anesthesiology, [2]Trakya Univ. Faculty of Health Sciences, Dept of Physiotherapy and Rehabilitation, Trakya Univ., [3]Trakya Univ. Faculty of Medicine, Dept of Anatomy, Trakya Univ., Turkey

Aim: The Cormack-Lehane score is a grading system commonly used to describe laryngeal wiev during intubation. The purpose of study is to investigate the anthropometric measurements of head and neck in relation to the Cormack Lehane classification. Methods: 303 adult patients (138 male, 165 female) submitted for elective surgery under general anesthesia were included in this study. Age, height, weight, hyomental distance, thyrosternal distance, neck circumference, neck dept and neck height were recorded during

preoperative evaluation. CL was used for visualization of the larynx. Results: There were not any significant corelation between CL and age, height, weight, neck depth and neck height (p>0.05). But hyomental distance, thyrosternal distance, neck circumference measurements showed statistical significant effect on the CL (respectively p=0,000, p=0,000, p=0,000). Conclusions: Cormack and Lehane classification is the most valuable test for predicting difficult intubation. CL is not used as preoperative bedside tests to predict a difficult airway. Therefore we need new methods easy applicable. According to our results, hyomental distance, thyrosternal distance and neck circumference useable instead of CL.

ANATOMY OF TREITZ'S MUSCLE OF ANAL CANAL

Kumiko YAMAGUCHI, Satoru MURO, Keiichi AKITA
Tokyo Medical and Dental University (TMDU), Japan

Treitz's muscle (M. submucosae ani) is one of the components of the anal cushions. It lays beneath the mucosa, and surrounds the lower part of anal canal. Treitz's muscle has been considered to have two origin. Some fibers are described to emerge from the internal anal sphincter (IAS), and others are thought to emerge from the conjoined longitudinal muscle (LM), and penetrate the IAS. We examined the structure of the smooth muscle fibers around the anal canal to understand their function. Ten Japanese cadavers were used for this study. For gross anatomy, we cut the five pelvises in median line, and removed mucosal layer under the operation microscope. For histological analyses, we embedded the anal canal and surrounding structures from the other five cadavers, and made frontal and/or sagittal 5micrometer sections. Sections were stained by Hematoxylin and Eosin, or Elastica van Gieson stain. Immunohistochemical study was also performed with anti-smooth muscle antibody and anti-skeletal muscle antibody. On the histological sections, three layers of smooth muscle was observed. …On the external surface of IAS, thin connective tissue layer was observed between IAS and LM. separating IAS and LM….According to the present findings, longitudinal fibers of Treitz's muscle are extended from circular IAS, and run downward covering the medial surface of the subcutaneous part of the EAS. In addition, LM penetrated EAS, and thought to have functional relationship with EAS. Closure of anus and length of the anal canal would have coordinated function.

ANALYSIS OF TONGUE MOVEMENTS

Ali YILMAZ
Trakya University, Anatomy, Turkey

The tongue is responsible for many different functions in human body. The tongue provides a path for food to travel through the digestive system, it has taste buds so that we can enjoy the flavor of that food, and the tongue is largely responsible for speech. The purpose of this study is to investigate the relation of the age, sex anathropometric measurements with a new, alternative method suggested to be used in estimation of tongue movements. 245 volunteers (126 men, 119 women) who were studying at our university participated in this study. Hyomental, sternomental distance, neck circumference and face height were measured. Horizontal and vertical lines used for determined of tongue movements. Horizontal lines passing through the mid points of the upper lip and mandible, and vertical lines passing through the right and left infraorbitale were constituted on each subject. And subjects were asked to protruding tongue maximally and downward, protruding tongue maximally and upward, and protruding tongue maximally and laterally in sitting position. The scores corresponding with the movements of tongue were compared with the anthropometric measurements and demographic data. Results: Both protruding tongue maximally and downward and protruding tongue maximally and upward were significantly different between age, sex, hyomental distance and sternomental distance (p<0.001, p<0.001, p<0.001 and p<0.001, respectively). Conclusion: The describe of tongue movements are very important in the diagnostic and treatment of neurological diseases. We conclude that the findings of this study will be a guide for other studies.

COMPARISON OF CORMACK AND LEHANE'S GRADE WITH ANTHROPOMETRIC MEASUREMENTS

ElifM. YILMAZ[1], Gulnur OZTURK[2], Ali YILMAZ[3]
[1]Edirne Sultan I Murat Devlet Hastanesi, Anesthesiology, [2]Trakya Univ. Faculty of Health Sciences, Dept of Physiotherapy and Rehabilitation, Trakya Univ., [3]Trakya Univ. Faculty of Medicine, Dept of Anatomy, Trakya Univ., Turkey

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FRIEDMAN TONGUE POSITION AND NECK ANTHROPOMETRY

Kayatekin A.Z. YILMAZER, M. KARAHAN, A. YILMAZ
Trakya University, Department of Anatomy, Turkey

Aim: Tongue anatomy is major component in the oropharyngeal view. The tongue position has been postulated to be an important predictor of difficult intubation (DI) and obstructive sleep apnea syndrome (OSAS). Friedman tongue position (FTP) may play an important role in the evaluation oropharynx of patients with OSAS and DI, but there are no previous data on FTP distribution by neck anthropometry. The aim of study was to determine the relationship between FTP and neck anthropometry. Methods: Prospective cross-sectional study of 102 volunteers (48 men, 54 women) who were studying at our university participated in this study. FTP was used for determined of tongue position. As the antropometric measurements, thyromental distance, thyrosternal distance and neck height were measured. The scores corresponding with the position of tongue in mouth were compared with the anthropometric measurements and demographic data. Results: There were not significant corelation between FTP with thyromental distance, thyrosternal distance and neck height (p=.0,905, p=0,547, p=0,392 respectively) Conclusion: The describe of tongue position in the mouth is very important in the diagnostic and treatment of respiratory and neurological diseases. We conclude that the findings of this study will be a guide for other studies.

ANATOMY OF CORONARY SINUS OSTIUM

Julija ZHIVADINOVIK, Marija PAPAZOVA, Niki MATVEEVA, Ace DODEVSKI
Medical Faculty, Institute of Anatomy, Macedonia

Introduction: The coronary sinus (CS) is the main cardiac vein and it has become a clinically important structure especially through its role in providing access for different cardiac procedures. Materials and methods: The study was carried out on 100 randomly selected adult human cadaver hearts fixed in 10% formalin. The transverse and craniocaudal diameters of the CSO were directly measured. The presence

of the Thebesian valve was noted and the anatomical details of the valve were documented in each case in terms of the shape and extent of coverage of the CSO. Results: Considerable variations in the diameter of the CSO were observed. The mean craniocaudal diameter of the CSO was 8.1±1.51 mm, and the mean transverse diameter was 7.67±1.72 mm. Heart specimens without Thebesian valve tended to have larger ostia. The mean craniocaudal diameter and the mean transverse diameter of the CSO were statistically larger in the specimens without Thebesian valves (p=0.000 and p=0.001, respectively). The Thebesian valves were observed in 86 hearts, and a wide variety of their morphology was seen. The majority of the Thebesian valves were semilunar in shape (74.42%). The extent to which the valve covered the ostium was variable, including remnant valves that covered <15% of the CSO (35%), and valves that were large and covered at least 75% of the CSO (22.09%). In 3 specimens the valve completely occluded the ostium.

ANALYSIS OF THE FREQUENCY OF DIFFERENT VARIANTS OF GALL BLADDER STRUCTURE IN INDIVIDUALS OF BOTH SEXES

Ludmyla ZUBKO, Viktoriya SERNYAK, Oleksandr ADAMOVYCH, Zoryana MASNA, Marta ZUBENKO, Maryana CHERVINSKA, Rostyslav SOHUJKO, Khrystyna PAVLIV
Danylo Halytsky Lviv National Medical University, Operative Surgery and Topographic Anatomy Dept, Ukraine

According to medical statistics in Europe and America gall-bladder diseases are diagnosed in 20-30 % of women and 10-15 % of men. With age, the incidence of cholelithiasis increases significantly… The aim of our work was to investigate the variations frequency of the structure of the gall bladder, which can cause the development of gallstones in patients of different sexes. In the process of work we have examined 300 people aged 16-60 years (150 women and 150 men) without liver and bile ducts diseases. During examination, it was found oval gallbladder in 65 men and 72 women, piriform – 85 men and 78 women. However, gall-bladder form and its cavity were not changed only in 125 men and 109 women, bend of the gall-bladder was found in 16 men and 24 women, and intersections in the cavity of the bladder – in 9 men and 17 women. In male gall-bladder bend was more frequently diagnosed in individuals with oval form of gall-bladder, and intersections – piriform gall-bladder; in female bends were diagnosed with equal frequency in individuals with both forms of gall-bladder, and intersections, as in male individuals – more frequently with piriform shape of the organ. Consequently, results of our investigation testify that intersections and bends of the gall-bladder, which can be the reason of the mechanic cholestasis, happen more frequently in female, regardless of the organ shape, but without any other factors, isolate such variants of the gall-bladder shape are not the reason of the pathology development.

