Resumenes

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USAGE OF THE RADIOLOGICAL METHODS OF INVESTIGATION FOR THE STUDY AGE, SEX AND CONSTITUTIONAL PECULIARITIES OF THE COMPLEX ANATOMICAL STRUCTURES

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One of the condition of the adequate diagnostics and optimal choice of methods of treatment of the diseases of the osteoarticular and dento-facial system is perfect knowledge of their morphological peculiarities. That is why up-to-date task of the theoretical medicine is determination of the normative morpho-functional indexes of the investigated areas, and for the practical medicine – development of the methods for the intravital study of their sizes and structure and application of the received data for the early diagnostic of the deviances. The aim of our investigation was study of the vertebral column and facial area with the account of the age dynamic, sex dimorphism and constitutional peculiarities with the usage of radiological methods. Materials and methods: 200 radiological orthopantomograms and 200 computer tomograms of the facial area and 300 X-rays and 100 computer tomograms of the vertebral column of the individuals of the juvenile and mature age were studied. Results: it was determined age, sex and constitutional peculiarities of the jaws, nasal cavity and sinuses, and morphological peculiarities of the permanent teeth during all stages of their roots formation; also, morphological peculiarities of the vertebral column, intervertebral discs and their correlation in different parts of the vertebral column depending from the age, sex and constitutional type of the examined individuals were established. Conclusions: usage of the radiological methods of investigation in morphology is not only desirable but also necessary, because it allows to study inner structures of the objects with preserving external entirety and opens new opportunities for deep morphological cognition of individual peculiarities of the organism.

RABBIT HAEMORRHAGIC DISEASE: CYTOKINE STORM AND BYSTANDER APOPTOSIS IN THE LIVER OF INFECTED ADULT RABBITS

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Rabbit Haemorrhagic Disease Virus (RHDV) induces a high morbidity and mortality rate in wild and domestic adult rabbits. In less than 3 days, 90% of adult rabbits will be dead due to virus-induced fulminate hepatitis. Evidence harvested in recent years has indicated that a strong surge in several cytokine may be as hepatotoxic for the RHDV-infected rabbit as the replication of the virus in liver cells. Thus, we have decided to evaluate the seric concentration of different cytokines (TNF-α, IL-1, IL-6, IL-8, IFN-α, IFN-γand IL-10) and to perform an immunocytochemical analysis of RHDV in the liver of adult rabbits dying from RHDV infection. We have confirmed previous evidence that fulminant hepatitis caused by the virus is associated with apoptosis of a large number of liver cells. We have frequently observed double-nuclei or apoptotic hepatocytes negative for labeling by anti-virus antibodies. We have also showed that RHDV infection induces an exacerbated inflammatory response, shortly before death that was characterized by a marked increase in cytokine values (cytokine storm), particularly TNF-αa well-known death inductor. We thus proposed that the marked apoptosis responsible for the severe hepatocellular damage results not only from the direct cytopathic effect of viral replication but also from bystander apoptosis mediated by marked secretion of cytokines during RHDV infection. (This work was funded by FCT-Portugal, grant nº PTDC_CVT_ 122905_2010, COMPETE and FEDER. Luzia Teixeira was supported by Fundo Social Europeu and MCTES through POPH-QREN- Tipologia 4.2.)

A STUDY OF THE ANTHROPOMETRIC CORRELATIONS BETWEEN UPPER LIMB MEASUREMENTS FOR PERSONAL IDENTIFICATION

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Introduction: The presence of multiple isolated commingled fleshed limbs or limb parts generates a significant challenge for forensic investigators in wars, mass disasters, and criminal assaults to establish identification. Although upper limb measurements have been used to establish individual identity in terms of sex and stature with high success, there is a scarcity in data concerning the correlations within upper limb parts. Aims: This study aims to assess the relationships within upper limb parts and develop regression formulae to reconstruct the parts from one another. Material and methods: The study subjects were 376 Sudanese adults (187 males and 189 females) aged between 25 and 35 years. Five upper limb dimensions were measured on the left side using standardized techniques. The data were analyzed using

SPSS) version 14. Results: The results of this study indicated significant sexual dimorphism for all variables. The results indicated a significant correlation within the upper limb parts. Linear and multiple regression equations were developed to reconstruct the upper limb parts in the presence of a single or multiple dimension(s) from the identical limb. Conclusion: Multiple regression equations generated better reconstr-uctions than simple ones. These results are significant in forensics and orthopedic reconstructive surgery.

MORPHOMETRIC ANALYSIS OF PALATAL RUGAE IN TWO ETHNIC POPULATIONS OF SUDAN

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Introduction: Palatal rugae are irregular mucosal folds in the anterior part of the hard palate. They are widely used in the dental and forensic fields as they remain stable throughout a person's life and are useful technique when other techniques as fingerprint, dental records and DNA comparisons cannot be obtained. Palatal rugae have variable morphologic features in their shapes, numbers, and dimensions. Many studies in different ethnic groups have documented these variations. Aims: This study among Sudanese aimed to compare the palatal rugae patterns among two ethnic groups and to assess the predominant pattern in each group. Materials and methods: A total of 100 subjects, 50 Arabs and 50 Nubians with equal male and female distribution, were selected in the age group between 18 and 30 years. Dental casts were obtained using alginate impressions of the maxillary arch and stone type IV. Rugae pattern were recorded for the total number, length, shape, and direction and these variables were analyzed using SPSS software version 14. Results: The wavy pattern was found to be the most predominant pattern followed by curved, straight, branch, unification, and angular. The non-specific pattern was the least in Nubians and crosslinked was the least in Arabs. The results established that there were no statistical significant population differences in all the morphological features of palatine rugae. Conclusion: Palatal rugae patterns fail to reveal any significant differences between the two ethnic groups. However, further work in larger samples is required to validate the findings.

ANTHROPOMETRIC STUDY OF THE EXTERNAL EAR AMONG ADULT SUDANESE ARABS AND ITS APPLICATION IN SEX IDENTIFICATION

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Introduction: Anthropometric studies have defined human body parts and their relation to each other and also provide standard data in different populations. A thorough knowledge of ear dimensions plays a vital role in assessing congenital malformation, forensic investigation and the ergonomic design of hearing aids. Several studies assessed the ear dimensions in various populations; however, populations have different sizes and proportions that affect the anthropometric assessment of sex. Aims: This study among adult Sudanese Arabs aimed to establish normal human external ear anthropometric standards and to assess the degree of sexual dimorphism in these measurements; then to explore the accuracy of these measurements for sex estimation. Materials and methods: The ear length, ear breadth, lobular length, lobular breadth, conchal length, conchal breadth, protrusion at superaurale level and protrusion at tragus level were measured in 200 Sudanese subjects (100 males and 100 females), aged 18 to 30 years, using a sliding caliper and geometric set square following standardized techniques. These variables were analyzed using SPSS software version 14. Results: All variables were sexually dimorphic apart from lobular lengths. The right and left ears were asymmetrical for all dimensions except for lobular and conchal lengths in both sexes and ear breadth in males. The ear measurements gave a moderate to good sex identification accuracy, ranging from 60.5 to 76.5% using discriminant function analysis. Conclusion: This study provides new anthropometric standards from ear measurements among healthy adult Sudanese Arabs that can be utilized in plastic reconstruction and forensic identification.

SELECTIVE ULTRASOUND-GUIDED TRANSGLUTEAL PUDENDAL NERVE BLOCK: IS IT POSSIBLE? AN ANATOMICAL INVESTIGATION

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Introduction:The aim of the study was to develop an ultrasound guided technique blocking ther pudendal nerve selectively. Materials and Methods: The investigation was performed on a 82 lower limbs embalmed with Thiel´s method, divided into two goups. The first group (39 limbs) oriented on the sciatic nerve solely and Injecting 2ml of white latex 1cm medial to the nerve at level of the lesser sciatic foramen. The second group (43 limbs) used the clearly determinable sciatic spine as a landmark. Both groups were assessed by dissection. In addition we measured the distances between the posterior superior iliac spine (PSIS) and the sciatic tubercle (ST) as well as the distance between the sciatic spine (SSp) and the sciatic tubercle (ST) in both groups. Results: First group: in two cases the pudendal nerve was covered by latex without reaching the sciatic nerve. 12 cases showed no spread around the pudendal nerve, 25 cases reached both the pudendal and sciatic nerve. Partial intramuscular injection was documented in 10 cases. The second group showed a distribution solely around the pudendal nerve in 33 cases, in 5 cases we reached the sciatic nerve two and in 5 cases we had an intramuscular injection. Mean distance between PSIS and ST was 17.8cm (min 15.5; max 20.5) and between ST and SSp 8.3cm (min 7.4; max 9cm). Conclusions: Orientation on the SSp showed a higher success rate as orientation on the sciatic nerve. A useful and constant distance is between the ST and SSP.

POSTERIOR PELVIC FRACTURE BLEEDING SOURCE IN RELATION TO ANATOMICAL BRANCHES DISTRIBUTION OF THE POSTERIOR DIVISION OF INTERNAL ILIAC ARTERY

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The internal iliac artery is a standard divides into anterior and posterior division. The posterior division of internal iliac artery divides into superior gluteal, iliolumbar and lateral sacral arteries. Current study includes 152 hemipelvis specimens to identify the branches of the posterior division of the internal iliac artery. In present study, the superior gluteal artery arising from the posterior division found to be in 85%. Further, the iliolumbar artery arising from the posterior division found to be in 68%. The lateral sacral artery arising from the posterior division found to be in 69%. The remains specimens, the superior gluteal, iliolumbar and lateral sacral arteries found to be either arising indirectly from the posterior

division as from different artery or from the internal iliac artery directly. Moreover, congenital absence of superior gluteal, iliolumbar and lateral sacral arteries has seen in few cases. The oburator and inferior gluteal arteries also found to be a branch of the posterior division in 5% of all specimens instead of the anterior division of the internal iliac artery. Therefore, the obturator and inferior gluteal arteries have a high risk of laceration in case of posterior pelvic fracture as well as the three previous classical branches of the posterior division. Consequently, understand anatomical background of variable branch of the posterior division of the internal iliac artery lead to decrease the postoperative complication as a result from a proper vascular ligation and control source of hemorrhage.

THE VARIABLE COURSE OF THE INFERIOR GLUTEAL ARTERY IN RELATION TO SCIATIC NERVE SUPPLY

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The inferior gluteal artery is one of large terminal branch of the anterior trunk of the internal iliac artery. As the inferior gluteal artery arises, it has different courses. In current study includes 150 specimens to clarify the anatomical course of inferior gluteal artery in relation to sciatic nerve roots. Inside the pelvis, the inferior gluteal artery frequently passed between second and third sacral root of sciatic nerve (S2 and S3) in 32%. However, the inferior gluteal artery passed either between the first and second sacral root or between the third and fourth sacral root in 11% or 10% respectively. In few cases, the inferior gluteal artery passed below the fourth sacral root in 5%. The inferior gluteal artery did no course sciatic nerve roots in 20%. Further, it was congenital absence in 12%. Therefore, the sciatic nerve roots have no supply from the inferior gluteal artery in 32%. The remains specimen, the inferior gluteal artery has been resected during dissection in 10%. Consequently, the inferior gluteal artery supplied the first sacral root in 11%, second sacral root in 33%, third sacral root in 42% and fourth sacral root in 15%. Therefore, the inferior gluteal artery provides a supply to sciatic nerve in pelvic region as well as in gluteal region. Surgeons have to be alert during surgery to avoid prolonged ligation leading to lower limb paralysis.

A NEW THEORY OF OBTURATOR ARTERY DEVELOPMENT

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Persistent axial artery is a rare anatomical variant: as it regresses the iliofemoral system develops. Failure of regression results in variable obturator artery origin. In a study of 342 specimens, a persistent sciatic artery was observed in 68 cases: the obturator artery had different origins in the presence of the sciatic artery. In early development, the primitive obturator artery usually arises from the primitive axial artery, regressing as soon as the primitive obturator artery develops from the primitive anterior trunk. With a delay in appearance of the primitive anterior trunk or internal iliac artery the obturator artery develops from the posterior trunk or external iliac system. The embryologic theory present here is based on three conditions. Firstly, the origin is based on the selection of channels via a primary capillary plexus which develop into the primitive obturator artery; secondly, early or delayed timing of primitive obturator artery growth may lead either to an unusual origin of the obturator artery or an aberrant obturator artery; thirdly, the vascular demand of tissues. Based on the current study a new embryological theory of the obturator artery is proposed which explains its origin as well as the presence of an accessory obturator artery.

A REVIEW OF DEEP FEMORAL ARTERY CHARACTERISTICS IN ASSOCIATION WITH A COEXISTENT OF SCIATIC ARTERY

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The common femoral artery divides into superficial and deep femoral (profunda femoris) arteries. Previous publications with a coexistent sciatic artery have described the anatomical characteristics of the profunda femoris. In sciatic artery aneurysm the profunda femoris has been reported to show either hypoplasia or aplasia. The current review is based on studies reported in the literature of sciatic artery aneurysm in relation to the size and course of the profunda femoris and includes 206 cases in 171 patients published between 1864 and 2012. The review shows that the profunda femoris is of normal size in 58.7% of cases; it was hypoplastic in 21.7%, hyperplastic in 4.4%, and absent in 15.2%. In addition, the profunda femoris found to be less likely to have a collateral circulation (2.2% of cases) and continue as the popliteal artery (2.2% of cases). Frequently (80.4%), the profunda femoris terminated at any level in the thigh. Patients with sciatic artery aneurysm may preceed to develop peripheral vascular disease culminating in lower limb amputation. Nevertheless, the profunda femoris could be used as a shunt for the sciatic aneurysm. Consequently, the features of the profunda femoris are significant factors to reduce risk of lower limb amputation.

TIME PERCEPTION AND ITS NEUROANATOMICAL SUBSTRATES

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The ability of organisms to adapt time and coordinate temporal sequences of events in their internal and external environments is vital to the organism's ability to adapt to the world around them. However the neural mechanisms underlying time perception are still unclear. Is the temporal information represented by specialized neural networks or is it regionally depending on the task? Reward and punishment are also known to be effective upon our future decisions and indeed reward has been shown to promote human performance in multiple task domains. In particular, it has been proposed that highly similar neural processes are engaged in response to the temporal tasks, entirely independent of any reward prospect. Taken together, these results suggest that the physiological mechanisms involved in the reward prospect and time perception are quite similar. While the above findings provide evidence for the view that reward prospect and temporal attention may act by utilizing similar processing routes, a systematic investigation of this proposed overlap, as well as the potential interaction between these two factors (reward system and time perception), is lacking. With the present functional magnetic resonance imaging (fMRI) study, we sought to elucidate the neural processes that are shared and distinct between brain regions responsible for time perception and reward prospection. Participants were 20 right handed young adults (age 19–39, mean 27.3 years). We employed a temporal attention task in

which observers had to extrapolate the velocity of an occluded moving object in reward vs. no-reward sessions. On each trial, the target displayed on the left side of the screen and moved toward right side becoming "invisible" in the center of the screen under an occluding surface and the velocity of the target was slightly increased or decreased in this invisible period. After the period of invisible motion, the target reappeared and participants were asked to make perceptual judgments whether it reappeared slightly too early or too late compared with its predicted velocity. In reward sessions the participants gained 1.5 TL (0.5€) per correctly done trial. Inside the scanner, the participants performed four 7-minute runs, yielding a total of 128 trials in each session. Two of the runs were rewarded and 2 were non-rewarded. Accordingly, fMRI images were acquired using a 3-T scanner with a 32-channel head-coil array. The most prominent activations associated with time perception included the right and left supplementary motor cortex, orbitofrontal cortex, right dorsolateral prefrontal cortex and middle temporal gyrus. And the most prominent activations associated with reward as compared with no-reward sessions included right and left caudate nucleus, right cingulate cortex and right para-hippocampal gyrus.

COMPOSITION OF THE PSOAS MAJOR MUSCLE IN PATIENTS WITH LOW BACK PAIN

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AIM: The aim was to investigate the changes of the psoas major muscles Cross Sectional Area (CSA) in patients with low back pain (LBP). Moreover, the aim was to examine association between the morphology of the psoas major muscle and expression of the degenerative changes of lumbar spine in patients with LBP. METHODS: T2-weighted scans for measurements of the CSA were performed on a 42 patients and 49 controls using a 1.5 Tesla superconducting MR system. Measurements were obtained on a modified transverse plane parallel to the referent intervertebral disc at L3/L4, L4/L5 and L5/S1 levels of the lumbar spine, respectively. RESULTS: Patients had bigger CSA of the psoas major muscle than controls at all analyzed levels. At the levels of L3/L4 and L4/L5 intervertebral disc the difference was statistically significant ($P < 0.05$). Patients with apparent degenerative changes of the lumbar spine had smaller CSA of the psoas major muscle compared to the patients without apparent changes at the levels of L3/L4 and L4/L5 ($P < 0.05$). However, CSA of the psoas major muscle in the patients with degenerative changes of lumbar spine was still bigger then the one of the healthy controls. CONCLUSION: Psoas major muscle shows signs of increased activity in LBP patients. Moreover, psoas major muscle also remains active regardless of presence of degenerative changes of the lumbar spine.

USING OF SINGLE FOREARM INCISION FOR TENDON TRANSFER FOR RADIAL NERVE PALSY: PROSPECTIVE STUDY

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Background: Loss of radial nerve function in the hand creates a significant disability. The patient cannot extend the fingers and thumb and has great difficulty in grasping objects. Perhaps more importantly, the loss of active wrist extension robs the patient of the mechanical advantage that wrist extension provides for grasp and power grip. Aim of the study: Tendon transfer using a single incision in its place can solve these problems in short time. Material and method: In prospective analysis, A total of 18 patients of radial nerve injury (17 men and 1 woman) with a mean age of 30 years (range, 22–40 years) underwent tendon transfer after failed nerve reconstruction. The exclusion criterion was radial nerve dysfunction resulting from brachial plexus injury. a 10 cm long incision is first marked over the radial aspect of the forearm extending from the middle third of the radial side of the forearm to 1 cm proximal to the radial styloid distally. All the tendons required for the transfer are explored and identified through the same incision. By good retraction of the wound proximally, Pronator teres muscle is raised from its insertion with a 4 cm sleeve of periosteum. Results and Conclusion: the average ranges of wrist movement were: mean extension was 56° ±5°, which was 85% of the maximum mobility of the opposite side. Mean flexion was 57° ± 5°, equivalent to 75% of the maximum degree of movement of the healthy side. Radial deviation was 17° ± 5°, and ulnar deviation was 55° ± 5°. The mean finger extension during wrist extension was 75° ± 5° and was almost similar in the wrist neutral position at 75° ± 5°. The mean palmar abduction of the thumb was 41°± 5°, which was 80% of the maximum mobility of the opposite side. Hand grip strength using a Jamar dynamometer, On average, the operated hand had grip strength of 25 ± 2 kg; the average of the healthy opposite side was 37 ± 2 kg (fig 10). After their tendon transfer, 14 patients still continue their previous carrier , 4 were unemployed changing their carrier from being heavy manual workers to lighter work to satisfy their new functions. All patients achieved a mean pronation of 80°±10° and a mean supination of 70° ± 10°, which amounts to a 12% restriction compared with the contralateral healthy hand.

ANATOMICAL STUDY OF THE ARTERIAL PERFORATORS OF THE GLUTEAL REGION AND ITS SURGICAL IMPLICATION

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Background: Despite significant advances in therapeutic options, pressure ulcers continue to pose a challenge to physicians and surgeons and frequently require multi-disciplinary input. Direct closure or skin grafting is useful only in a small number of early pressure ulcers. For non healing and advanced pressure ulcers, reconstructive surgery is indicated, which consists of soft tissue flap coverage such as fasciocutaneous, musculocutaneous, perforator, or free flaps. Aim of the study: the aim of the current study is to design surgical technique based on using gluteal musculature to provide rich blood supply and insure good nourishment for skin defects associated with pressure sore and pilonidal sinuses. Material and method: Anatomically, seven fresh cadavers were used in this study. They were obtained from the dissecting room of the anatomy department, Cairo University, Faculty of Medicine. The common iliac arteries were explored and perfectly dissected to record the sites of the main perforating fasciocutaneous vessels and the presence of anastmosis between the arteries supplying gluteus maximus muscle. Surgically, twenty patients had parasacral defects. Ten patients were suffering from sacral pressure sores and were treated by transposition of lower based fasciocutaneous flaps. The other ten patients were suffering from recurrent pilonidal sinuses and were treated by wide excision of the sinuses with its tracts and transposition of Z- plasty fasciocutaneous flaps. Conclusion: The gluteal region is rich with an abundant blood supply offering an array of large musculocutaneous and fasciocutaneous flaps suitable for wound closure. The rational for reconstruction in this region is to use of musculocutaneous flaps based on the gluteal musculature that provide good vascularity, generous soft tissue padding, and resistance to infection.

MEDICAL PROCEDURES ON CADAVERS - PERSPECTIVE

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Basic needs for completion of mastery in different medical specializations are the understanding and gaining skills in minimally invasive techniques. The courses shifts from demonstrations limited to operating theatres to practical hands-on trainings into specialized training centres. These centres must dispose of different equipment and devices but not only in technique and instruments, but also in a variety of teachers experience. Our experience in the Centre building on our department lead to recognizing of the need of construction of the Network of Excellence under the auspices of European Association of Clinical Anatomy (EACA) and International Academy of Clinical Anatomy (IACA). Our Centre offers an advanced approach to the practical training concentrated in one place – cadavers suitable for imitation of different medical procedures, a fully equipped operating theatre with endoscopic towers for both rigid and flexible endoscopies, X-ray C-arm for traumatology and invasive radiologic procedures, operation microscope for a wide range of microsurgical procedures, interconnection by an audio-video network with a Wi-Fi approach to Internet. For creation of educational materials and e-learning materials designed for the selected practical course the centre disposes with a graphic studio. These modules are prepared in advance to a hands-on courses enrolment. Interconnection of similar centres will represent the maximum progress achievable in medical procedures simulations and will improve practical skills of physicians throughout the Europe or the world. (Supported by RP MSMT and EU Funds OPPC CZ216/3100/ 24018)

EXPRESSION OF MYOGENIC TRANSCRIPTIONAL FACTORS IN RAT SKELETAL MUSCLES

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The family of muscle specific basic helix-loop-helix (bHLH) regulatory factors consists of MyoD, Myf-5, myogenin and MRF-4. These factors contribute to the transcriptional activation of muscle genes during commitment and differentiation. Each of these myogenic bHLH proteins form a heterodimer complex that builds DNA, and includes other bHLH proteins E2 gene family and builds canonical DNA sequence, CANNTG (E box) within the gene enhancing elements that encode markers of terminal differentiation of skeletal muscle. A distinct role for the bHLH myogenic factors initially was suggested by their different temporal expression patterns in the somites and limbs during embryonic development. Gene knock out experiments provided evidence for the role of MyoD and Myf-5 in myoblast commitment, whereas myogenin is required for terminal myoblast differentiation. Myogenic transcriptional factors are involved in the process of the muscle denervation and regeneration on the protein or on the transcriptional level.

TOPOGRAPHY OF THE SUPRAORBITAL VASCULAR-NERVE BUNDLE WITH REGARD TO MIGRAINE HEADACHE

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Aim: Recent findings of the pathogenesis of migraine headache argue against a central vasogenic cause and verify a peripheral mechanism involving compressed craniofacial nerves. Additionally, Botulinum Toxin injections as a new treatment approach for migraine headache patients demonstrate efficiency and support a peripheral mechanism. Methods: The supraorbital regions of 10 alcohol-glycerine fixed specimens of both sexes were dissected micro-surgically. Both the supratrochlear (STN) and the supraorbital nerve (SON) were identified and their topographical relationship with the corrugator supercilii muscle (CSM) investigated. The shape of the exit from the orbita of both nerves was defined, the interaction of the supraorbital artery (SOA) and the SON determined. Results: We could reproduce three compression points of the STN. The nerve exits from the orbit in one half of the cases with two branches. In seven cases, it pierces as a whole or already ramified, the CSM. The SON enters into the brow through the supraorbital notch, which is bridged by a ligament in seven cases; just one hemiface showed a foramen. In all hemifaces, just the medial branch pierces the CSM. In seven cases the SOA crosses the SON; in one case the SOA runs with the SON. Conclusion: Our data support the hypothesis of a peripheral mechanism for migraine headache. Overall, the CSM is constantly perforated by the SON, and quite often by the STN, too. As tested by Botulinum-induced paralysis, also a surgical release of the perforating nerves by splitting the CSM can result in amelioration of migraine headache.

HISTOLOGICAL CHARACTERIZATION OF CONCENTRATED GROWTH FACTORS AND THE RELATED CLINICAL OBSERVATIONS

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Aim: Although there are many studies in which CGF was evaluated for its clinical efficacy, the data regarding its histological characteristics are limited. Aim of this study was to evaluate the CGF structural morphology and its clinical efficacy in soft tissue recovering. Methods: It has been selected a female patient with implants already placed and a thin gingival biotype. According to the protocol, four CGF membranes were obtained. Two of them have been used for the clinical implants, and the others have been processed for the morphological study (H.E., A.M. and blue toluidine stains). Results: At the optical microscopy analysis both membranes showed a three concentric layers organization. The first layer consisted of no nucleated small cell bodies, like erythrocytes. In the second layer, the fibrin network entrapped many cellular elements and showed many blue stained (A.M. stain) circular bodies too, like cross cut collagen filaments. In the A.M. stained sections, the third layer appeared blue coloured and between the fibrin filaments, larger than that observed in the second one, other corpuscular fragments were found, like platelets. The semi-thin sections analysis permitted to highlight the different

orientation of the fibrin filaments and the particular disposition of the links, confirming the presence of cell bodies. The 9-months clinical follow-up of the treated patient showed a clear gain of gingival tissue around the implant comparing it with the pre-operative situation. Conclusions: This study confirms the clinical efficacy of CGF and was aimed to integrate the clinical results with the related morphological knowledges.

LOCALIZATION OF STEROID HORMONE RECEPTORS IN HUMAN NERVOUS TISSUE

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Objective: Steroid hormone receptors (SHR) are members of a supergene family of ligand-dependent transcription factors. SHR are involved in supervision on reproduction and sexual behaviour but the relation to behaviour models, perception, and memory is still unclear. Expression of the SHR within certain parts of the human brain has been found. However, a comprehensive analysis of SHR expression in the human brain has not been performed. Material and Method: The overall survey of SHR distribution within the human brain has not been done yet. Our aim is to investigate the expression of SHR in different anatomical areas of the brain with focus on the neocortex. The immunohistochemical localization of estrogen receptors (ER), progesterone receptors (PR) and androgen receptors (AR) was examined. Autopsy withdrawal of particular regions of the human brain was done. Gender and developmental aspects were taken into consideration. Conclusions: The expression of SR within the brain cortex shows interesting revelation, which could be the first step to understand new relation and action of the steroid hormone receptors in brain as an interrelationship to human functioning and behaviour. Additional experiments have to be done and relation between the SHR expression and the purpose of their placing remains to be revealed. These results indicate on the possibility of SHR detection in post-mortal brain that is very important for next experiments. The research is still running and more samples are necessary.

PRESERVATION OF ANATOMICAL SPECIMENS – EMBALMING METHODS

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Objective: Cadavers remain a principal tool for anatomists and medical students in gross anatomy. Dissection of embalmed cadavers exposes students, teachers and other staff to chemicals of fixation and preservation of cadavers. Since 1868 the formaldehyde for the preservation has been used, later on glycerine as additional chemical. The most frequently used fixatives and disinfectants are formalin, ethanol and phenol. Material and Methods: To exchange composition of used fixatives and disinfectants we have detoxified vats from the old embalming solution. In new embalming solution we use thymol instead of phenol, according to evidence of higher safety. Thymol has antiseptic ability 25× more effective than phenol. The high antiseptic effect occurs already in the solution of 1:3 000. What is essential, thymol is not put into the group of carcinogens and due to its lower ability to be dissolved in water; it is less poisoned then phenol. For the fixation we use combination of formalin, thymol, ethanol and distilled water. For the preservation only thymol, ethanol and distilled water is used. Conclusions: The new embalming solution of wet anatomical specimens is tested now. Next methods for the different usage of anatomical specimens are the method of plastination and fixation according to Thiel. Methods that we plane to implement, allowed applying clinical anatomy in real practical courses of urgent medicine training, endoscopy training, surgery of joints training etc. *(This project has been funded with support of the ESF and the MSMT in the Czech Republic, project „Partnership network for theoretical and practical education of the emergency medicine, disaster medicine and current pre-hospital care with anatomical and clinical relationships“ registration number: CZ 1.07./2.4.00/ 17.0059)*

OSTEOMETRIC SEX DIFFERENCES OF FOOT BONES ARE CONCENTRATED ON THE PROXIMAL-DISTAL AXIS AND ON 2TH AND 4TH RAYS

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Diagnosis of sex is one of the main points of forensic medical and criminalistics examinations. Defining osteometric parameters of bones of the additional skeleton of the lower limb according to many authors provides valuable material for this. The aim of this study was to determine the basic regularities of variability and sexual quantitative differences of osteometric parameters of bones of the human foot. Materials for the study were 120 cases of observation (women and men approximately equally). Direct osteometry was made using electronic caliper type with a digital reading device and an accuracy class 1 until 0.01 mm. Standard osteometric measurements of phalanges, metatarsals, calcaneus and talus were made. Statistically significant sex differences were detected for the following osteometric parameters of bones: length, maximum length, as well as physical indicators of the bones volume and its weight and bone density. The authors confirmed the own hypothesis that sex differences are focused on the long tubular bones of the second and fourth rays, which play a key role in determining the morphogenesis and architecture of the autopodium and on the proximal-distal axis on the other bones of the foot. The authors found that statistically significant sexual differences inherent to long tubular bones of the foot (phalanges and metatarsals) are parameters characterizing the size of their epiphyses exclusively (width and height of the head and the base, width and height of the articular facets of the head and the base, distal, middle and proximal diaphyseal width). The possibility of using the detected differences as criteria for the diagnosis of the skeletal sex is discussed.

MORPHOLOGICAL BRANCHES DISTRIBUTION OF THE ANTERIOR DIVISION OF INTERNAL ILIAC ARTERY

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The internal iliac artery divides into anterior and posterior divisions. Current study includes 152 hemipelvis specimens to clarify the branches arising from the anterior division of the internal iliac artery. In present study, the anterior division have provided umbilical artery in entire specimens. The gluteopudendal trunk (a trunk gives off inferior gluteal and internal pudendal arteries) arising directly from the anterior division found to be in 31% specimens. The gluteo-obturao-pudendal (a trunk gives off inferior gluteal, internal pudendal and obturator arteries) arising directly from the anterior division found to be in 4% specimens. The obturatopudendal trunk (a trunk gives off internal pudendal and obturator arteries) arising directly from the anterior division found to be less than 1% specimens. Further, the inferior gluteal and

internal pudendal artery found to be in 32% and 47%. Therefore, the inferior gluteal, internal pudendal and obturator arteries originated from the anterior division indirectly. The inferior gluteal internal pudendal arteries arose from directly anterior division in 33% respectively. The obturator artery arose from the anterior division in 55% directly. Knowing the major branch distribution from the anterior division of the internal iliac artery may help radiology to recognize the variability. Therefore, the surgeons have to be aware of anatomical variation to minimize the iatrogenic disease.

POTENTIAL EFFECT OF DIFFERENT ANATOMIC LOCALITIES ON ADIPOSE DERIVED STEM CELL BASED CLINICAL APPLICATIONS

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Aim: Adipose tissue in different anatomic localities contains an abundant population of multipotent adipose-tissue-derived stem cells (ASCs) that possess the capacity to differentiate into cells of the mesodermal lineage for potential clinical application. ASCs are the most important factor also for soft tissue augmentation via fat auto-transplantation. We have investigated whether the yield and function of ASCs are affected by the anatomical sites most frequently used for harvesting adipose tissue: the abdomen and hip/ thigh region and resultant effect on fat auto-transplantation. Methods: Viability and number of ASCs from the abdomen and hip/thigh region samples were determined after enzymatic disaggregation by Cedex XS (Roche, USA). The potential of these ASCs was verified by DI3D scans in clinical application via fat auto-transplantation. Results: The characteristics of ASCs had 3,018% ± SEM of stromal vascular fraction cells (SVF). A significant difference was seen in ASCs frequency between adipose tissue harvested from the abdomen (3,79% mean ± SEM) and hip/thigh region (0,7%). DI3D scans revealed that anatomic locality and numbers of ASCs have significant (R^2=0,2678; p=0,05) impact on fat auto-transplantation success. Conclusions: We conclude that the yield of ASCs, are dependent on different anatomic localities. The abdomen seems to be preferable to the hip/thigh region for harvesting adipose tissue, in particular when considering ASCs for clinical applications such as fat auto-transplantation. (This work was supported by the grant of Ministry of Health of the Slovak Republic No. 2012/4-UKBA-4 and by the grant of Slovak Research and Development Agency No. 0434-12)

CHANGES OF CALCIUM/CALMODULIN-DEPENDENT PROTEIN KINASE II EXPRESSION IN SPINAL CORD IN RAT MODELS OF TYPE 1 AND TYPE 2 DIABETES

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Aim The aim of this study was to investigate the expression of CaMKII in the dorsal horn of spinal cord in early model of DM type 1 and type 2. Methods DM1 model was induced in Sprague-Dawley with 55 mg/kg of streptozotocin (STZ) and DM2 model using combination of high-fat diet and low-dose STZ. Pure citrate buffer was injected to control rats for DM1 and DM2. The expression of total CaMKII and its alpha isoform in dorsal horn was quantified using immunofluorescence. Results Increased expression of tCaMKII and its alpha isoform was seen in dorsal horn of DM1 animals 2 weeks and 2 months after diabetes induction. Expression of total CaMKII and its alpha isoform in DM2 animals was increased 2 weeks, but not 2 months after diabetes induction. CaMKII alpha was predominantly expressed in laminae I-III. Discussion Changes in the CaMKII expression were observed in DRG and dorsal horn six months and one year following induction of DM1. However, the expression pattern of CaMKII in dorsal horn in early diabetes has not been reported yet. Conclusion The observed changes in the expression of CaMKII and its alpha isoform may be involved in the neuropathic pain development in DM1 and in early DM2 neuropathic changes.

HEPARIN-INDUCED OSTEOPOROSIS MODEL IN MICE

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Aim: The purpose of this research was to present the model of heparin-induced secondary osteoporosis in mice. Preventive and curative effect of bone morphogenetic protein 6 (BMP6) was also shown as a treatment possibility in this model. Methods: CD-1 strain female mice were divided into five groups, as follows: (1) control, only saline, 50 µL/day iv, for 6 weeks; (2) positive control, heparin 1 IU/g/day iv, for 6 weeks; (3) treatment group 1: heparin 1 IU/g/day iv + BMP6 10 µg/kg iv three times a week, for 6 weeks; (4) treatment group 2: heparin 1 IU/g/day iv for 6 weeks, after which BMP6 10 µg/kg iv three times a week, for 4 weeks. Femur and tibia BMD was measured before and after the treatment using DXA. MicroCT (µCT) was used at the end of treatment to analyze femur and tibia bone parameters (BV, BV/TV, Tb.N, Tb.Sp). Results: After six weeks of treatment, heparin induced significant bone loss, which was confirmed by DXA and µCT. Both treatment groups showed no femur bone loss compared to control animals. On the other hand, only combined therapy of heparin and BMP6 showed no statistical difference in all measured parameters in tibia, while subsequent BMP6 therapy did not prevent bone loss. Conclusion: Heparin induced secondary osteoporosis in a dose of 1 IU/g/day within a period of six weeks. Combined therapy with BMP6 prevents negative effect of heparin on bone, as shown by no difference in BMD, BV and Tb.N values compared to control animals.

COMPLEX INTERACTIONS OF GASEOUS AND PARTICULATE EMISSIONS, NKT CELLS AND BTEX ON PEOPLE WITH ENVIRONMENTAL DISEASES

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Introduction: urban air pollution represents a common and difficult problem in the majority of metropolises, which contain high levels of traffic congestion generating great amounts of genotoxic substances. Volatile organic compounds (VOCs) play an important role in ecological damages, disturbing the ecosystem and human health. It is well-known that the blood-air relationships of benzene, toluene, ethylbenzene, and the xylenes (BTEX) were dependent by smoking, exposure-smoking interactions, and by gender and age, while the other VOCs were not. The objectivities and methods of our study: were to determine the connection between the concentration of BTEX in urine, the immunological status (phenotypic profile of peripheral blood lymphocytes and releasing of cytolitic molecule perforin from these cells) and respiratory illnesses in people from industrial area and those from rural fields. Results: people living in urban industrial fields have significantly diminished values of PIF (inspiratory peak flow),

FIVC (inspiratory forced vital capacity), FIV1 (volume inspired in the first second of the test) and FVC (forced vital capacity) and significantly increased the concentration of o-ksilen, benzene, toluene and etilbenzene, as well as the number of NK and NKT cells. Conclusion: BTEX-analyze in urine, as an important and easy method represents a good marker in environmental monitoring which contributes better protection of air pollutants and quicker diagnosis of COPD and asthma.

FUNCTIONAL ANKLE/FOOT RANGE OF MOVEMENT IN PARALYMPIC SWIMMING

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Objective: Functional adaptation of ankle/foot range of movement (ROM) measurement in paralympic swimming. Methods: Interpretation of adapted joint mobility testing for the specific functional range of movements for paralympic swimming. Results: The amount of functional ankle/foot range used in Freestyle (S) strokes is very different to Breaststroke strokes (SB). S – Dorsiflexion starts at 40 degrees of plantarflexion. Points are awarded for the amount of movement achieved from this point moving towards neutral. The ankle does not have to achieve neutral range as this is not required during the stroke. Dorsiflexion is essentially measured in what is considered plantarflexion. The movement direction is important. SB – Dorsiflexion starts at neutral and points are allocated for the active range available from neutral (This range is NOT measured in S). S – Plantarflexion starts at 8 degrees of plantarflexion and points are awarded for active movement up to 41°+ (Plantarflexion range from 0-8 degrees is not allocated with points). SB– plantar-flexion starts at 0 degrees and points are allocated for the active range available from neutral (The initial part of this range is NOT measured in S). S – Supination starts at 0° and ends at 30° +. SB – Supination starts at 0° and ends at 33° +. S – Pronation starts at 30° of supination/inversion and ends at 0° + (This range is NOT Measured in SB). SB – Pronation starts at 0° and ends at 21° +. Conclusion: S stroke requires an ankle/foot to be mostly plantarflexed and supinated. SB stroke requires the ankle/foot to utilize all available range thus the measurement method is adapted to the needs of paralympic swimming.

ANATOMY COMIC STRIPS

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Anatomy comic strips were elaborated in order to enable medical students to learn the complexities of anatomy in a straightforward and humorous way. The 451 anatomy comic strips in English have been drawn for over a decade. Supplementary 180 episodes of the science comic strips were yielded. Whole comic strips were made accessible on the homepage (anatomy. co.kr) with no payment or registration. The contents were also uploaded on the facebook (page: anatomy comic strips). 93 Korean medical students, who looked through the comic strips, were surveyed with questionnaire. The students might laugh at the comical situations of comic strips only after acquisition of anatomy knowledge; they then recognized how anatomy enriched them. They wrote back that comic strips facilitated memorizing the anatomy contents. Besides comic strips helped them enjoy chatting with the medical and non-medical persons, and change the attitude toward anatomy and medicine. Now a day, students are reluctant to specialize in anatomy because of the prejudice that living as anatomist is boring and exhausting; comic strips could be a novel tool to demonstrate intriguing and worthwhile activities of anatomists. Creation and educational use of benefiting comic strips are ongoing.

CORRELATION OF KLINGLER FIBER DISSECTION TECHNIQUE AND HIGH-DEFINITION FIBER TRACKING (HDFT) METHOD FINDINGS: A GOOD SURGICAL NEUROANATOMY LAB MODEL FOR CONFIRMATION THE NEUROANATOMICAL STRUCTURES

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The detailed knowledge, provided by the white matter dissection technique, reveals the intrinsic architecture of the brain. Still understanding of the three-dimensional organiz-ation of fiber bundles in the white matter of the human brain is limited. Nowadays, the importance and necessity of a precise understanding of the neuroanatomical structures and white fiber anatomy for the neurosurgeon are greater than ever. This is important because recent introduction of high-definition fiber tracking (HDFT) is capable and has been applied in many of normal subjects and on many neurosurgery patients. HDFT is a novel tractography method that can tract several thousand fibers from cortex to cortical and subcortical structures. This novel combination of processing and reconstruction is able to do this with at least millimeter resolution and is important for complex fiber crossings. The anatomy of gyri and sulci of the specimen's were studied with serial photography at each process of the dissection. The gray matter of sulci in the region being studied was progressively removed, and the short association arcuate fibers were exposed. By dissections beginning on the lateral hemispheric surface long fibers such as superior longitudinal fascicle were demonstrated in deep part of the gyral white matter. In these steps by HDFT tracking representation of the corresponding structure was obtained. This lab model that was used in the surgical neuroanatomy laboratory allows to correlate and to confirm of the neuroanatomical structures step by step. By combination of these two methods, investigation and comparison of structural connectivity between structures of the human brain, their neuroanatomical validations and enhancement of the critical research is possible.

MICRO-CT PARAMETERS OF THE TIBIAL PLATEAUS IN RELATION TO ENDOTHELIN-1 SERUM LEVELS IN PATIENTS WITH END-STAGE OF THE OSTEOARTHRITIS

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Background and Aims: Osteoarthritis (OA) is a degenerative joint disease, characterized by progressive cartilage damage and sclerosis of the underlying subchondral bone within a joint. The changes in the density and the architecture of the underlying subchondral bone have a profound effect on both the initiation and progression of cartilage degeneration. Endothelins (ET) have been recognized as the most potent vasoconstrictor agents known. ET-1 is produced by many cells and it's production is modulated by systemic hormones and local factors. The aim was to evaluate alterations of the subchondral bone, by performing micro-CT analysis of the:

medial, lateral and central regions of the tibial plateau, and also to correlate micro-CT parameters to serum endothelin-1 levels. Patients and Methods: Tibial plateaus were collected from twenty patients who underwent total knee joint replacement surgery. Their blood samples were collected for soluble endothelin-1 detection. Serum endothelin-1 concentration was determined by ELISA method. By use of micro–CT the following parameters were determined: Bone volume (BV/TV, mm^3), bone surface density (BS/TV, /mm), trabecular thickness (Tb.Th, mm), trabecular number (Tb.N, /mm), degree of anisotropy (DA), total porosity (Po(tot), %) and connectivity density (Conn.Dn, /mm^3). Results: Mean serum ET-1 values were measured at 0,45 fmol/ml. The highest bone volume values were found in medial regions of the tibial plateaus (BV/TV = 506,3 mm^3), while th highest degree of anisotropy was found in the central regions of the tibilal plateaus (DA = 51,5 (0,98)). Serum ET-1 values were significantly correlated to the micro-CT parameters. Conclusion: Bone volume and bone microstructure significantly differed between regions of the tibial plateaus, which confirm that changes in bone architecture are evident in OA. Circulating ET-1 levels significantly correlated to micro-CT parameters, indicating their role in OA pathophysiology.

THE EFFECT OF THE ANTHROPOMETRIC PARAMETERS, AGE, VERTEBRAL BONE DENSITOMETRY AND ASH DENSITY ON ILIAC CREST'S BONE VOLUME AND MICROSTRUCTURE

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Background and Aims: Transiliac bone biopsy is necessary tool in diagnostic procedures, and frequently used method in therapeutic follow-up of the resistant osteoporosis. On the other hand, bone densitometry is the most frequently used technique in estimation of the bone status. The aim was to analyze the extent to which: anthropometry, age, bone densitometry and ash density affect bone changes of the iliac crest, assessed by bone histomorphometry. Patients and Methods: Iliac crest's bone samples were obtained out of 88 autopsy cases. Prior to bone histomorphometry, two consecutive 5 μm sections were stained and photographed at 40X. Bone samples of the third lumbar vertebra underwent bone densitometry and atomic absorption spectrometry. Results: Results revealed that bone volume (BV/TV) was significantly predicted by age (β = -0,7), ash density (AD) (β = -0,23) and BMD (β = 0,23). Bone surface (BS/TV), trabecular number (Tb.N), trabecular separation (Tb.Sp) and cortical bone volume (CV), were significantly predicted by age, with beta ponder values of: β = -0,36, β = -0,75, β = 0,8 and β = -0,41, respectively. Trabecular thickness was significantly predicted by age (β = -0,3) and BMD (β = 0,44). Cortical thickness was significantly predicted by age (β = 0,1), body height (β = -2,4), body weight (β = 3,8), BMI (β = -2,5) and BMD (β = 0,5). Conclusion: Bone mineral density is the strongest and also positive predictor of the iliac crest's trabecular thickness and cortical thickness. This suggests that total amount of the inorganic matter of the scanned vertebral bone surface is strongly related, and therefore, could predict changes that affect the iliac crest's trabecular and cortical thickness.

EFFECT OF ISOLATION TECHNIQUE ON STEM CELL CHARACTERISTICS AND MULTILINEAGE DIFFERENTIATION POTENTIAL OF HUMAN ADIPOSE TISSUE-DERIVED STEM CELLS

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Aim: Adipose tissue represent rich and safe source of somatic stem cells. The present study is aimed at comparison of two different isolation techniques and their effect on biological properties of stem cells. Methods: Adipose tissue-derived stem cells (ATSCs) were obtained from lipoaspirates by two different methods. The first one was based on repeated washing and centrifugation to remove erythrocytes. In the second procedure, adipose tissue was filtered through puregraft™. Both methods followed by collagenase type I digestion and subsequent centrifugation. Resultant oil and tissue debris fractions were aspired. Sediments containing ATSCs were resuspended in complete culture medium and seeded into culture flasks. ATSCs were cultured under standard conditions. The morphology was analyzed by inverted microscope and TEM. Cytometric analysis was performed to analyze expression of surface antigens. The multilineage differentiation potential was analyzed as well. Results: In both cases, after 24 hours ATSCs were adhered on surface of culture flasks in similar densities. Difference was recorded in higher amount of contaminating erythrocytes in method based on washing and centrifugation. During following cultivation ATSCs displayed same morphological features, expression of surface antigens and chondrogenic, osteogenic and adipogenic differentiation potential. Conclusions: The obtained data suggest that both isolation techniques can be applied to obtain suitable amount of ATSCs without alternation their biological properties. However, in case of isolation using puregraft™ it require 1 less step in protocol, which significantly reduce time of this procedure. (This work was supported by grant of Ministry of Health of the Slovak Republic 2012/4-UKBA-4, by grant of Slovak Research and Development Agency 0434-12, and Adyton Company)

TOPOGRAPHICAL ARRANGEMENT OF PLEXUS HYPOGASTRICUS AND ITS IMPACT FOR PELVIC SURGERY

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Background: The superior and inferior hypogastric plexus are paired structures supplying the pelvic cavity with a high clinical relevance by innervations of rectum, uterus, vagina and urinary bladder. The knowledge about the exact topographical arrangement is essential for prevention of severe complications during pelvic surgery. Aim: To investigate the topographoanatomical arrangement and variations of plexus hypogastricus and pelvic blood supply in the light of the most frequently used operative pelvic procedures. Methods: Using around 30 Formalin and Thiel-embalmed cadavers, we applied a 3 way comparative approach by combining (i) postmortal angiography and CT imaging of the pelves; (ii) laparoscopic surgery (sacrocolpopexy, hysterectomy, lymphadenectomy); (iii) visualization of pl. hypogastricus and pelvic blood supply by recently developed new microdissection methodology. Results: Four clinically relevant reference points have been identified: (i) promontorium, (ii) Iliac vessels, (iii) lig. sacrouterinum, (iv) A. and Vv. uterine (superior and inferior). The topographoanatomical arrangement and variations of plexus hypogastricus and pelvic blood supply has been described. Superior hypogastric plexus revealed high

variability in appearance and position from diffuse, chaotic thin meshwork to robust strands along vertebral column. In opposite, the topography of the splanchnic pelvic nerves, inferior hypogastric plexus and the vegetative nerves accompanying uterine vessels seems to be very consistent. From all pelvic nervous compartments, the splanchnic nerves seem to be most vulnerable and exposed to surgical injury. Conclusions: In the light of the obtained results and identified critical anatomical relationships, diverse surgical complications could be exactly explained and avoided. The obtained knowledge allowed us to propose less traumatic surgical procedures.

ROLE OF CT ANGIOGRAPHY IN DETECTION OF INTRACRANIAL ANEURYSMS

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Introduction: Aneurysms of the cerebral vasculature is a fairly common condition, they occur approximately in 2% to 6% of the general population. In most of the cases aneurysms remain asymptomatic and the persons are usually unaware of their presence, but the real danger is when an aneurysm ruptures, leading to a subarachnoid hemorrhage. The aim of this study was to investigate the frequency of occurrence of intracranial aneurysms in the Macedonian population and to emphasize the role of CTA in the diagnosis of aneurysms. Materials and methods: We examined radiographs of 85 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. For the purpose of this study 37 females and 48 males, ranging in age between 27 to 83 years, mean age of 59.9±11.3 years, were analyzed for the presence of aneurism. Results: In five (5.88%) patients of 85 analyzed reports aneurysms was found. According to the localization, in four patients the aneurysm was on the anterior circulation, in one patient the aneurism was localized on the posterior circulation or vertebrobasilar system. According to the size three of the aneurisms were small and two were giant. In all cases the shape and neck of the aneurysm ware precisely demonstrated. Conclusion: Intracranial aneurysms are relatively common, occurring in approximately 5.88% of the Macedonian population. CTA is the initial vascular imaging modality of choice for detection on aneurysms because is considered as a relatively safe, fast and minimum invasive procedure. CTA provides valuable information about aneurysms by defining the relationship of the aneurysm to the parent and branch vessels, by delineating its relationship to the skull base especially before planning surgical or endovascular treatment.

HISTOMORPHOLOGY OF THE ECTOPICALY INDUCED BONE MORPHOGENESIS

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Aim: Investigate a dynamics of histogenetic processes of the ectopis osteogenesis. Materials and methods: Demineralized bone matrix implants were implanted subcutaneously pectoral region in rats. Animals were sacrificed after 5, 7, 14, 21 and 30 days of implantation. Hemalun-eosin, toluidine blue and Goldner trichrome staining were obtained. Results: At the 5th day of the implantation, a firm connective fibrous membrane on the surface of the implants was detected. Surface of the demineralized bone particles within the implant is subjected to multinuclear cells degradation, observed as lacunae and fissures. In the implants at the 7th day of the experimental protocol, similar morphological features to those of the 5th day were characterized by: thick fibrous membrane at the surface, high cellular infiltration between bone particles, numerous blood vessels and increased resorption. At the 14th day the first signs of the induced chondrogenesis are seen. Chondrocytic nests, consisted of hypertrophic chondrocytes, surrounded with the small amount of the metachromatic extracellular matrix are situated in between the bone particles. Also, cellular infiltration, bone particle degradation and blood vessels penetration are seen. At the day 21, some cartilage nests are degradated. Newly formed bone trabeculae, built of immature woven bone tissue are seen on the surface of the implant. Between bone particles, three-dimensional network of the bridging bone trabeculae is seen. At the 30th day of the experimental procedure for complete degradation of the implants is present. Conclusion: Histomorphological changes in implants correspond with process of endochondral and intramembranous ossification.

TESTING TWO METHODS OF OSTEOSYNTHESIS AFTER MEDIAN STERNOTOMY

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Aim: Osteosynthesis with stainless steel bone wires is accepted as the standard method of sternum closure after sternotomy. Nitinol clips are relatively new and promisisng ostheosynthetic material. Main aim is to investigate biomechanical properties of osteosyntehsis made by wires and nitinol clips. Methods: The sterna samples were placed at a device which operates as a dynamometer. 33 samples were joined by stainless steel wires N°6 and 32 samples with nitinol clips. We were defining the magnitude of yield load which influences the fragments of sternum and at the same time we were measuring fragments shift at three places. Results: The most common place of bone fracture is at the sternoxyphoid junction by 38 (60,3 %) samples, followed by the fracture at the manubrium sterni in 22 (34,9 %) samples. Average and total sternum fragment shifts by groups are significantly bigger by nitinol clips samples. Conclusion: Ostheosynthesis made by wires is seemed to be stronger and safer. On the other hand, it is possible that osteosynthesis made by nitinol clips is more elastic and therefore more appropriate for patients with osteoporosis or for those with very small and narrow sternums.

PATHOMORPHOLOGICAL PECULARITIES OF THYROID DISEASES IN MALE AND FEMALE PATIENTS

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Aim: To identify morphological features of thyroid diseases in men and women operated on thyroid pathology in Lviv Region in 2012-2013 years. Materials and methods: Analysis of pathohistological examinations of surgical material of 494 patients operated on thyroid disease at the Lviv Regional Clinical Hospital and Military Medical Clinical Centre of West Region in 2012-2013 years has been carried out. Results: Among the total number of the diseased who underwent pathohistological examination of thyroid surgical material were 70 men (14.2%) and 424 women (85.8%). Ratio of number of men to number of women in studied group was 1:6. 267 patients have been revealed to have multinodular non-toxic goiter: 26 men (9.7%) and 241 women (90.3%). 34

patients have demonstrated Hashimoto's autoimmune thyroiditis: one man (2.9%) and 33 women (33.1%). 71 patient have been revealed to have focal thyroiditis: 4 men (5.6%) and 67 women (94.4%. 173 patients have demonstrated follicular adenoma: 33 men (19,1%) and 140 women (80.9%. 101 patient have demonstrated papillary cancer: 21 men (20,8%) and 80 women (79,2%. Diffuse toxic goiter, follicular, poorly differentiated and medullary cancer have been revealed in women only. Conclusions: Among patients operated on thyroid pathology in Lviv Region in 2012-2013 years Hashimoto's autoimmune thyroiditis and focal thyroiditis, multinodular goiter, follicular adenoma, papillary cancer and other malignant tumors were revealed often in female versus male patients.

ANATOMY OF PORCINE LIVER VENOUS VASCULAR BED BASED ON CORROSION CASTS

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Aim: With the use of resin corrosion casts we aimed to analyze hepatic vascular branching and territories. Methods:For the corrosion casting liver from 3 domestic piglets (age 42–70 days, weight 12–25 kg) were used. Before the hepatectomy, the vascular tree was flushed with 5 l heparinized Hartmann's solution. Yellow dyed Biodur E20 (Biodur products, Heidelberg, Germany) was injected via the portal vein. To prevent embolization and artefacts, the liver was positioned with its diaphragmatic surface upwards into a bowl-shaped container filled with water. Liver microvasculature was studied using a standard human multi-slice CT device (Somatom Sensation 64, Siemens, Forchheim, Germany). Subsequently, the micro CT (XCT 400 equipped with a 90kV x-ray source, Xradia, USA) was used to perform the high resolution scanning. The microarchitectonic of liver vessels up to the level of sinusoids was demonstrated by volume rendering technique and thin slab maximum intensity projection (Figure 1). Results: We present a macro- and micro-CT reconstruction of the porcine liver venous vasculature based on epoxy resin Biodur E20. Completing macro- with micro-CT scans enables to image the entire vascular bed, sophisticated software packages allow to separate the caval from the portal systems. Conclusion: We present reconstruction of the porcine liver venous vascular bed based on corrosion specimens prepared with Biodur E20 epoxy resin. As the domestic pig anatomy resembles that of the human, it is frequently used as a surrogate animal model. Detailed knowledge of liver vascular anatomy is essential to improve liver surgical procedures. (This work was supported by the Internal Grant Agency of the Ministry of Health of the Czech Republic under Project No. IGA MZ CR 13326, SVV No. 260 047, by CENTEM project, reg. No. CZ. 1.05/2.1.00/ 03.0088, and co-funded by the ERDF as part of the Ministry of Education, Youth and Sports OP RDI programme).

PREVALENCE OF THE LINBURG-COMSTOCK ANOMALY THROUGH CLINICAL EVALUATION

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Introduction: Most papers report on the rate of Linburg-Comstock anomaly presence of 12.5 to 36%. Anomalous tendon connections from the flexor pollicis longus to the index finger flexor digitorum profundus cause lack of independent excursion of the flexor pollicis longus. Most cases are asymptomatic. The rare symptomatic cases typically have pain or discomfort in the volar aspect of the wrist or distal forearm. The purpose of this study was to evaluate the incidence of this anomaly in general population. Material and metods: We examined 220 healthy subjects (139 female and 81 male) bilaterally for the presence of the Linburg-Comstock anomaly. They were initially asked to do the active flexion of the thumb for the presence of the anomaly.Results: The Linburg-Comstock anomaly was present in 118 (53.64%) subjects. Forty five subjects (20.46%) had it unilaterally, and 73 subjects (33.18%) had it bilaterally. Of those subjects with unilateral presentation, 26 (11.82%) subjects had the anomaly in the right forearm, and 19 (8.64%) had it in the left forearm. Bilateral absence was slightly more common in men. Right-sided presence was more common in women but the difference was not statistically significant. Left-sided presence was more common in men and the difference being statistically significant (X^2 = 3.97, $p<0.05$).Conclusion: The female to male ratio of the Linburg-Comstock anomaly presentation was 1.2 to 1. In both sexes, the bilateral incidence was more common than unilateral.

ARTHTOPHONY OF THE FEMOROPATELLAR JOINT: ASSESSMENT OF HEALTHY AND ILL

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Background: After defining noise ranges of healthy femoropatellar joints in a previous study, an assessment of ill joints was performed. The declared aim was determination of a pathological range. Materials and methods: 34 test persons (TPs) were included in the study. All of them had a diagnosed knee joint defect on one of the knee joints. Arthrophony was performed on both joints of the TPS. The TPs had to undergo a 10 minute running test at a speed of 8km/h. Statistical analysis included three parameters: the area under the curve, the arithmetic average of the amplitudes and the peak. Results:A total number of 68 joints were investigated. Unfortunately 50 % of our data had to be discarded due to technical failure during data recording. Statistical evaluation of the remaining joints showed that the pathological values of all three parameters are significantly different from the healthy. Statistically the area under the curve showed ranges with a specifity of 77% and sensitivity of 55%. Peaks showed the lowest probability of specifity and sensitivity. Conclusions: Arthrophony showed significant differences between healthy and ill joints. However, further investigations need to be performed to increase quality of the investigation.

ROTATION OF THE LIMB AND CHANGE OF POSITION OF THE SCIATIC NERVE: ANY INFLUENCE ON NERVE BLOCK TECHNIQUES?

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Background: We evaluated the influence of rotation on the sciatic nerve position and its consequence on sciatic nerve block techniques.Materials and methods: 10 volunteers were investigated with MRI. MRI of all right lower limbs from level of the lesser sciatic foramen to the knee joint were investigated in 5 positions (outer rotation +40°,+20°, neutral or 0°, inner rotation -20° and -40°). Following distances were measured in all resulting images: nerve to the dorsal surface of femur in sagittal and transversal plane, ventral dorsal and lateral distance nerve-skin and the angle nerve-femur. Topographical changes were compared with the existing sciatic nerve block techniques.Results: Outer rotation (+20°,

+40°): the angle nerve-femur was smallest and the transversal distance femur-nerve the longest.0° and inner rotation (-20°,-40°): from the midpart of the body of femur to distal level, the sciatic nerve went off the path dorsally and distance to the femur gets smaller. No rotational influence was documented on the sagittal distances as well as the dorsal and ventral distance nerve-skin. Conclusion: Ventral techniques are preferable in outer rotation because the nerve is transferred medially, possibly with a lesser trochanter in the needle´s path. Inner rotation transfers the nerve laterally, closer to the skin and more dorsally which has to be kept in mind for lateral techniques.

PARTNERSHIP NETWORK FOR THEORETICAL AND PRACTICAL TRAINING OF ANATOMICAL AND CLINICAL IMPLICATIONS OF EMERGENCY MEDICINE AND URGENT PRE-HOSPITAL CARE

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Objective: On June 2011 we were assigned to start with the research team on the project called “Partnership network for theoretical and practical training of anatomical and clinical implications of emergency medicine and urgent pre-hospital care”, CZ.1.07/2.4.00/17.0059. This multidisciplinary project represents an opportunity to create a functional and cooperative partnership focused on interdisciplinary exchange of information. Our faculty in Olomouc is one of the few institutions in the Czech Republic which has successfully integrated practical education of the subject Emergency Medicine and Catastrophe Medicine. Material and Methods: The main objective is to restore the primary milestone of medicine, which includes anatomy, clinical implications and ensuring of fast response of the students in emergency. The project aims to establish two centres which complement each other – Training and Education for Emergency Medicine and Catastrophe Medicine, and Anatomical-Clinical Plastination Centre which enables education by means of utilising unique human material for tuition of emergency medicine and other branches. Moreover, the important part of the project was to train military experts in terms of their mental and physical health before their missions abroad. Conclusions: There were three international conferences held and almost 70 one-day to several-day-long workshops. The project received a lot of attention and demonstrated that the discipline of anatomy can form a valuable partnership, contribute to research activity, influence the development of other disciplines and increase the quality of teaching in order to attain a better preparation of the future medical and non-medical specialists. In 2013 the project was nominated for the international Prince Mahidol Award.

LARGE AND SMALL CAVA SEPTI PELLUCIDI: DO THEY CLINICALLY DIFFER?

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Aim. For long period a postnatal cleft between laminae of septum pellucidum, has been treated as sign of an underlying neuropsychiatric disease, such as schizophrenia, De la Tourette disease, schizotypal personality disorder, post-traumatic stress disorder (PTSD), etc. The aim of our study was to compare size of cava septi pellicidi and eventual underlying neuropsychiatric diseases in order to estimate is there any connection between dimensions of CSP and assessed disorders. Methods. Our dissectional study has been carried out on 479 cadavers (310 male and 169 female), aged 22 to 89, autopsied in the Institute for Forensic Medicine at the School of Medicine, University of Belgrade. Data relating medical history were matched with the cause of death, determined after autopsy. Attention was paid to neuropsychiatric diseases and disorders, such as schizophrenia, alcoholism as well as to prior head traumas. In our sample 110 cava septi pellucidi were obtained. Results. In our sample of 479 brains, 110 cava were obtained (total prevalence=22.96%) from 75 males and 35 females, from 40 normal individuals, 25 schizophrenics, 25 alcoholics and 20 people with a history of head injury associated with aggressive behavior. Small cava were remarked in 50 cases (10.44% in the examined group, 45.45 % of the entire sample of CSPs), 32 males and 18 females. Asymptomatic cava dominated in sample with small CSP, while symptomatic cava were numerous in population with large CSP. Conclusion. Large CSP are undeniably related with neuropsychiatric disorders, while small CSP could be treated more like an anatomical variation.

EXPRESSION OF PTHRP AND PTHR/PTHRP RECEPTOR 1 IN THE SUPERIOR CERVICAL GANGLIA OF RATS

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Aim: Parathyroid-related protein (pthrp) and its receptor PTHR are found in CNS and peripheral nervous system. Although is known that pthrp/PTHR system is influenced by ovarian hormones in different tissues, it is not known whether these factors have similar effect on expression of pthrp and PTHR in nervous system. The aim of the study was to investigate a presence and distribution of pthrp and PTHR in neurons and glia of the SCG of rats, as well as an influence of the ovariectomy on their expression. Methods: An immune-histochemistry of the paraffin-embedded specimens of the SCG in male and female (ovariectomized and sham-operated) rats, followed by the analysis of digital microphotographs, by using Image J software. Results: Pthrp and PTHR immunoreactivity was observed in cytoplasm as well as in nuclei of almost all neurons in the SCG. In male rats intensity of pthrp fluorescence was significantly higher in cytoplasm of NPY-, in comparison to NPY+ neurons ($p<0.05$). In female rats, two months post-ovariectomy, significantly lower intensity of pthrp fluorescence in cytoplasm of the SCG neurons was observed in comparison to sham operated animals ($p<0.05$). In addition to expression in neurons, pthrp and PTHR immunoreactivity was observed also in most of the glia and was not influenced by the ovariectomy. Conclusion: Results show the expression of pthrp and its receptor, PTHR, in majority of neurons and glial cells in SCG of rats. Expression of pthrp, but not PTHR in cytoplasm of SCG neurons is influenced by the ovarian activity.

GROWTH AND BEHAVIORAL EFFECTS OF PRENATAL CORTISOL INJECTION ON EARLY POSTNATAL DEVELOPMENT OF OFFSPRING OF LABORATORY MICE

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According to numerous data prenatal stress has a significant negative impact on the development of the offspring during

the early and later postnatal periods of ontogenesis. At the same time, the number of studies comparing the direction and severity of the effects of prenatal stress in early and late periods of ontogenesis is insufficient and contradictory. The purpose of this study is to compare early and later effects of prenatal stress on the structure and function of steroid-producing and steroid-depending reproductive organs in the experiment. For prenatal stress modeling pregnant female mice were with treatment of cortisol in a critical period of formation of the reproductive system in dose of 1.5 mg. The effects of prenatal treatment with cortisol resulted in accelerated growth of tail, trunk and hind paws of offspring to 20th day of postnatal development, followed by alignment of the body length with control animals on 30 day. At 20th day experimental animals had statistically significant high weight of body compared with control animals (experience - 11.3±0.75 g, control – 8.9±0.29 g), and length of hind paws (experience 17.6±0.07 mm, control - 16.01±0.11 mm, respectively, $p<0.05$). The group of experimental animals revealed elevated levels of anxiety and locomotor activity in the test "open field". The number of movements of animals of the experimental group exceeded the same indicator in the control group twice (66.0±11.8 vs. 33.1±5.8, $p<0.05$). Thus, prenatal exposure to cortisol as model of the prenatal stress during the critical period of development of organs of the reproductive system affects the growth and behavior of the offspring in the early postnatal period.

MORPHOLOGY OF THE ATRIAL SEPTAL POUCH – NOT JUST ON THE LEFT SIDE!

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Aim Our aim was to study the morphology of the left atrial septal pouch (LASP), a newly discovered anatomical entity. Incomplete fusion of the septa primum and secundum has been suggested as its mechanism of formation. Methods: 43 cadaveric hearts were examined following careful dissection. The presence of a patent foramen ovale and septal pouches were recorded. The pouches were recorded and sliding calipers (+- 0.1mm) were used to measure the a) opening width b) radius of curvature c) thickness of pouch wall d) depth. Results Left atrial septal pouches were present in 16/43 hearts (37%) with a mean opening width of 10.7 mm (2.5-18.6mm), radius of curvature of 4.9mm (0.5-19.2mm), depth of 4.7mm (0.1-15.9mm) depth and thickness of 0.5mm (0.1-12.5). Where present, the number of pouches in a single specimen ranged from 1 to 4 (26 cusps in 16 hearts). Additionally we noted that similar pouches were present in the right atrium in 11/43 hearts (26%) with relatively smaller measurements (a. 5.7mm, b. 2.5mm, c. 3.8mm, d. 0.4mm). Conclusion: This study demonstrates, for the first time, a detailed morphology of the left atrial septal pouch. Additionally, we also describe the presence of similar right atrial septal pouch. This data suggests that both atria can be subject to septal pouch formation during primum and secundum fusion. Those patients with larger and more numerous pouches may be at risk of thromboembolic events.

NOVEL BONE MORPHOGENETIC PROTEIN-6 BIOCOMPATIBLE CARRIER DEVICE FOR BONE REGENERATION- OSTEOGROW

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BMP6 is a member of TGF-β superfamily with a high potential to induce new bone formation. Recently, we discovered that new carrier consisting of blood coagulum components can be used for the application of BMP6 which is further tested in our study. The carrier consists of modified self-derived blood coagulum for which BMP6 possesses high binding affinity. Beside osteogenic activity of OSTEOGROW device we tested influence of novel device on inflammatory reaction in the surrounding tissue in comparison with commercial available bone devices. An ulnar segmental-defect model was used to evaluate bone healing in adult male New Zealand White rabbits. The implants consisted of blood coagulum as a carrier to which different amounts of rhBMP6 were added (50, 100 and 200µg). These animals were compared with animals receiving blood coagulum alone (negative control) and collagen sponge (HELISTAT®, Integra LifeSciences, Holdings Corp., Plainsboro, New Jersey) to which the same amounts of rhBMP6 were added (positive control) in vivo for 8 weeks. Implants with WBCD containing rhBMP6 induced complete radiographic osseous union across the defect. None of the control animals treated with WBCD only (i.e., no BMP) achieved full rebridgement of the defect. The BMP6 implants seem to be similarly active at all given doses and in comparison with commercial device they accelerate and enhance bone formation. Observation of the inflammatory reaction in the surrounding tissue in rabbits with implanted WBCD devices revealed no inflammation at the implantation site. The Helistat implant used in BMP2 and BMP7 commercial bone device produces a pronounced inflame-matory response so it is of special importance that the OSTEOGROW device does not cause similar effects in the surrounding tissue and thus becomes a safer device for future applications. Recombinant human GMP produced BMP6 will be tested clinically in two indications for regeneration of the metaphyseal bone. The new device OSTEOGROW will be cost-effective, safer and therapeutically superior to existing commercial devices. (Investigation and development of device are supported by a EC's seventh framework programme (FP7) OSTEOGROW)

BIOCOMPATIBILITY OF DENTAL MATERIALS: IMMUNOCYTOCHEMICAL EXPRESSION OF EXTRACELLULAR MATRIX MOLECULES AND CELL PROLIFERATION RATES

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The aim of the present work was to investigate the biocompatibility in vitro of biomedical biomaterials employed in stomathology, in order to assess useful biological parameters, i.e. the correlation between cell proliferation rates and the expression of various antigens of the extracellular matrix (ECM), as well as to obtain useful information for the subsequent "in vivo" investigations.. Since in the study of biocompatibility of dental implants many reports have been performed regarding the aspects of osteointegration processes, few studies have examined the relationships between soft tissues and biomaterials. In particular, we would study the relationship between cell proliferation rates of cultured fibroblasts to the immucytochemical expression of molecules involved in cell adhesion mechanisms to ECM, i.e. fibronectin, chondroitin sulfate and a_5b_1 integrin. We observed that cell proliferation was related in particular to the expression degree of fibronectin. As far as the different dental implant surfaces were concerned, we found that fibronectin exhibited a greater immunocytochemical expression in fibroblasts cultures in the presence of smooth surfaces correlated with higher fibroblast proliferation rates, suggesting that smooth surfaces could allow a better adhesion of cells of the soft oral tissues, i.e. gingival connective tissue. We think these results could be interesting, since the integration of implant dental materials requires not only the best osteointegration, but also an optimal adhesion of gingival soft tissues to the apical part of the same dental implant. These

findings could also suggest that dental implant surfaces should be manufactured to obtain the best osteointegration in its deeper part, whereas the best fibroblast adhesion in its apical portion.

DIFFERENT COMPONENTS OF THE FINAL GRADE IN ANATOMY: HOW DO THEY COMPARE WITH SUBJECTIVE PRE-EXAM EVALUATION OF STUDENT PERFORMANCE

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Aim: Assessment in our anatomy course includes written (35 quizzes and 2 partial exams), practical and oral components. The final grade is a sum of differently pondered exam components. Anatomy tutors have daily contact with students during practical classes, where they orally examine (and grade) every student. Prediction of how well students do on the final exam can be expressed as an informed-guess. These guesses can then be compared with each component of the final grade. Methods: 89 first year medical students were included in the analysis. Written (scores and grades), quizzes (scores and grades), practical and oral exam grades were compared with an informed-guess based on an agreement between 3 tutors. Variations between different components of the final grade were also analyzed. Results: The informed-guess grade showed the highest correlation with quizzes (r= 0.82 and 0.84 for scores and grades, respectively). A smaller, but still significant correlation was found between the written (r= 0.72 and 0.69 for scores and grades, respectively), oral (r= 0.5) and practical components (r= 0.44). Correlation with the final grade was also significant (r= 0.66). When expressed as a means, the smallest difference was found between quizzes and final grades (2.66 vs. 2.6) and between the total grade and informed-guesses (3.02 vs. 3.04). The mean value of the final grade was highest, with an average of 3.69 ± 1.3.Conclusion: Subjective impression is a reliable predictor of student performance. Quizzes correlate well with written results and their ponders could justifiably be higher.

THE LENGTH AND POSITION OF THE LATERAL INTERCONDYLAR RIDGE

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Introduction: Lateral intercondylar ridge (LIR) is recognized as anterior border of the anterior cruciate ligament's (ACL) femoral footprint. It is the main landmark to determine the placement of the femoral tunnel during anatomic reconstr-uctions of the anterior cruciate ligament. Aim: The purpose of this investigation was to establish the incidence of presence of the LIR in femoral specimens, and to determine the length and position of the LIR on the roof of the intercondylar fossa. Materials and methods: We analyzed 19 femoral specimens of unknown age and gender at the Department of Anatomy, Faculty of Medicine, University of Rijeka. The LIR has been divided into the part that belongs to the condyle and the part that belongs to the roof of intercondylar fossa. The border is presented by the sagittal axis which is extending in the spatial angle between the lateral condyle and the roof of inter-condylar fossa. The length of LIR was measured from the sagittal axis to the LIR end on the roof of intercondylar fossa. Results: The condylar part of the RR was in standard linear position in all examined specimens. The length of the LIR at the roof of intercondylar fossa was 0,631 cm expressed as mean value (SD ± 0,065). In only one case the LIR at the roof of intercondylar fossa was double–curved, "S" form. In some cases, the LIR at the roof of intercondylar fossa exceeds from linear form to irregularly shaped rough area. Conclusion: Our result showed that LIR is represented rather by straight line than curved. Its part which belongs to lateral femoral condyle is mostly linear. In majority of samples LIR part which belongs to the roof of the intercondylar fossa is also linear. These findings are important in performing anatomic ACL reconstructions, especially if personalized double bundle technique is used.

PREPARING AND ASSEMBLING NEW TUTORIAL WORKBOOK FOR MEDICAL IMAGING METHODS COURSE IN UNDERGRADUATE MEDICAL EDUCATION

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The introduction of Medical Imaging Methods Course required the editing of a tutorial for students. Our aim was to provide a new sectional anatomy workbook, which guides students through the head, neck, thoracic, abdominal and pelvic regions with photos and, CT and MRI pictures. Sections from two formalin fixed female cadavers were prepared, then 7 sections were selected from the head and neck, 6 from the thoracic, 6 from the abdominal and 4 from the pelvic regions. Both cadavers were scanned by CT and MR. The body sections were placed between acrylic glass plates sealed with rubber gasket, therefore students can safely study them during practices. We matched the corresponding CT and MR images for all sections. Legend for each section was put on separate transparency film so the labeling does not hide the fine details of the images. This transparency film can be separately moved between the pages, hence no labeling required on the CT and MRI pictures. The workbook with new layout will stimulate students for self-testing while preparing for the exam and the removable labeling will urge them to find the labeled structures on their own. We found didactically useful to illustrate the outlines of clinically important spaces on a separate transparency film and thoroughly explain them in an appendix. Additional MR images from patients were also included. We hope that the new workbook will help students to better understand the 3D structure of the human body, which lead to better interpretation of CT and MR scans.

FUNCTIONAL AND CLINICAL UPPER LIMB ANATOMY TAUGHT THROUGH LOGICAL ANALYSIS OF THE BRACHIAL PLEXUS

Jens HIRSCHBERG

Normal as well as clinical neuromuskuloskeletal functional anatomy is often suboptimally taught with logical reasoning steps missing from what is and ought to be a purely logical process. The process begins with an understanding of the morphology of the brachial plexus, for example, a diagram with each spinal level represented by a colour. Regarding the motor aspects, students need first to learn the muscles supplied by each nerve and the spinal levels in each branch of the nerve. They also need to learn the joint action or actions of each muscle. They can use this fundamental knowledge to logically determine normal function, as well as the loss of function caused by any lesion to any nerve or part of the brachial plexus. This leads to an appreciation of the cause of many palsies, joint movement weaknesses or pathological or compensatory joint actions caused by any neural lesion. This simple process empowers the student to thoroughly consolidate their understanding of general neuromuskuloskeletal function, through logical and sequential reasoning based entirely on basic knowledge. The process also facilitates an understanding of the implications of individual anatomic differences, and motor and sensory losses caused by segmental damage at a spinal level. Pertinent examples are Froment's sign and claw hand with damage to the ulnar nerve at different locations, ape hand, wrist pathomechanics and their solutions, radial nerve palsy,

Erb-Duchenne palsy, and Klumpke paralysis. Using the procedure outlined, the cause of these pathologies can be simply understood without resorting to additional specific memorisation.

SENSIBLE NERVE SUPPLY OF THE DISTAL RADIO-ULNAR JOINT WITH REGARD TO WRIST DENERVATION

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Aim: The objective of this examination was to determine the precise point of departure of the articular branches innervating the distal radio-ulnar joint (DRUJ) from the anterior and posterior interosseous nerve (AION and PION). Despite their necessity for the technique of wrist denervation, the detailed courses of these nerve fibres have not been described in detail so far. Material and methods: The study's sample consisted of 116 adult human cadavers' upper limbs, embalmed using Thiel's method. The course of the AION and PION in relation to the anterior interosseous artery (AIA) was inspected and the dissection of the articular branches to the DRUJ was performed via preparation microscope. Additionally, the terminal course of the volar trunk of the AIA was evaluated. Collected data were measured from the radial styloid process as point of reference. Results: The articular branch of the AION to the DRUJ was at an average proportion of 14.2% and the analogue fiber of the PION at 15.4% of the distal part of the radius. The upper border of the pronator quadratus covered the bone up to a mean proportion of 27.6% of its distal section measured from the styloid process. Covered in most cases by the substance of the pronator, the posterior trunk of the AIA perforated the interosseous membrane at a mean proportion of 25.4%. Conclusion: Wrist denervation from volar approach, if performed at the upper border of the pronator quadratus, eliminates the nerve supply of the DRUJ completely.

ANATOMICAL CONSIDERATIONS OF LIVER HANGING MANEUVER

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Aim: In the anterior approach to the right hemihepatectomy the mobilization and excessive handling of the liver is avoided during surgery. A part of the procedure is the liver hanging maneuver in which a 4-6 cm blind dissection between the inferior vena cava (IVC) and the liver is performed. An anatomical study was carried out to evaluate the safety of this approach because short subhepatic veins, which enter the IVC from the left paracaval region (segment 1) and the right paracaval region, could be torn and a difficult to control hemorrhage could occur. Methods: On 100 corrosive casts of livers, the anterior surface of the inferior vena cava was studied to evaluate the position and the diameter of short subhepatic veins and the position and the diameter of the inferior right hepatic vein. The wideness of the narrowest point on the planned route of blind dissection was determined. Results: The average distance from the right border of the inferior vena cava, to the openings of segment 1 veins was 16.7 $\pm$ 3.4 mm and to the openings of veins from the right paracaval reagion was 5.0 $\pm$ 0.5 mm. The average value of the narrowest point on the route of the blind dissection was 8.7±2.3mm (range 2-15mm). Conclusion: The results show that the liver hanging maneuver is a safe procedure. With the dissection in the proposed route, the risk of disrupting short subhepatic veins is low.

BLOOD FLOW CHARACTERISTICS IN MODIFIED AND EVERSION CAROTID ENDARTERECTOMY

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Aim. Eversion CEA has been established as standard operating procedure with relatively few complications for patients with significant internal carotid stenosis. Due to the pitfalls of the eversion CEA (eCEA) and technical difficulties we have developed modified CEA (meCEA) procedure. We aim to show, using 3D modeling and flow simulations that technically less demanding meCEA has a better hemodynamic characteristics and greater blood flow rate than eCEA after restenosis occurrence. Methods. Modified CEA differs in making an incision along CCA from bifurcation downwards through the midline of CCA to the end of atheromatous plaque and and ending under the angle of 45 degrees at the ICA side. For each procedure, eCEA and meCEA, two series of progressive restenosis models were created. Blood flow simulations were done under simulated physiological conditions. Blood velocities, wall shear stress and vorticity were obtained for each model. Mathematical approximations of cross-sectional areas of internal carotid arteries (ICA) were calculated for eCEA and meCEA. Results. Cross-sectional area in meCEA models was approximately 1.6 times larger. Maximal blood velocities in eCEA ICA models were greater than in meCEA ICA models for the first grade restenosis, same as the average blood flow velocity, but with progressing restenosis bloodvelocities decreased in eCEA models while in meCEA models they remained relatively constant. Blood flow rates were greater in meCEA models through all three grade models. Conclusion. Modified CEA models show better flow characteristics with progressing restenosis with higher volume flow rates in ICA and better hemodynamic factors.

ALPHA-LIPOIC ACID IMPROVE DECREASED REGENERATION CAPACITY OF DIABETIC SLOW SKELETAL MUSCLE

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Increased oxidative stress and impaired antioxidant defence are important mechanisms in the pathogenesis of diabetic neuromyopathy. Since diabetes mellitus type 1 decreases muscle regeneration capacity the present study was designed to determine the influence of alpha-lipoic acid (LA), a potent biological antioxidant, on the process of regeneration of diabetic rat slow skeletal muscles. The regeneration process was provoked in streptozotocin induced diabetic rats in slow (m.soleus, SOL) skeletal muscles by intramuscular injection of myotoxin bupivacain. At intervals of ten days and four weeks, muscle histochemical and morphometrical analysis (fibre cross areas and fibre type distribution) was performed. Changes induced by diabetes are evident in redistribution of muscle fibers and in significant level of atrophy. After four weeks of diabetes, type II muscle fibers showed higher percentage in respect to control group. Slow muscle treated with LA showed a complete recovery with significant higher percentage of type I fibers. Muscle atrophy is present in all fiber types of slow skeletal muscle. Treatment with LA induced significant increase in cross sectional area in both fibre types. Our results have shown that treatment with LA can reduce changes in the morphological properties caused by diabetes mellitus in slow rat skeletal muscles during the

process of regeneration. Treatment with LA during four weeks has shown effects on the redistribution of muscle fibers and can prevent atrophy in slow diabetic skeletal muscle.

MORPHOLOGICAL BODY STRUCTURE IN MACEDONIANS DEFINED WITH FACTOR ANALYSIS

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The aim of the study is to determine the morphological body structure in Macedonians at the age of 12. Factor analysis of manifest anthropometric variables showed latent factors which defined the anthropometric space at this age in Macedonian youngsters. A cross section study of 22 anthropometric variables of fourth dimension (LDS, TDS, CDT, PMT) was made in 200 examiners of both sexes, with methodology of IBP. The results have shown that in male examined group M12 three latent factors persist: F1, F2, F3, which defined anthropomorphological space, whereas in female examined group F12 four factors: F1, F2, F3, F4. The law of body differentiation in female examinees is manifested at the age of 12 and in male examinees two year later (14 years of age). At the age of 12 in both sexes, under-mechanisms for specific LDS are defined, responsible for longitudinal arm growth. At this age morphological body structure in males is defined with only three factors and in females it is more complex, being defined with four factors.

VASCULAR-ASSOCIATED ALTERATIONS IN THE HIPPOCAMPUS ALONG AGING

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Aim: Vascular involvement in the onset, progression and severity of neurodegeneration has increasingly been recognized, which prompted us to study microvascular-associated alterations that might contribute to age-related brain vulnerabilities. Methods: hippocampi from C57BL/6 mice at young adulthood (6 months), at middle (12-14 months) and old (23-28 months) ages were immunohisto-chemically examined for vessels (CD31), pericytes (PDGFR-β), blood-borne molecules (thrombin and albumin) and receptor for advanced glycation end-products (RAGE). Results: we observed a ~35% decrease ($p<0.05$) in microvessel density in old versus young animals, reflecting hypovascularization of the aged hippocampus. The hippocampal number of vessels with no ensheathing pericytes rose from 19% in young to 32% in middle-age mice ($p<0.05$), and progressed to 38% in old animals ($p<0.05$), suggesting an age-related microvascular fragility. CA1 was the most affected region, showing an increase from 20% to 45% in the number of microvessels not covered with pericytes. Thrombin and albumin were increasingly detected in the parenchyma with age, pointing to enhanced microvascular permeability in association with aging. RAGE, a receptor expressed by endothelial cells that is responsible for the brain influx of molecules like amyloid-β peptide, was elevated in CA1 and other hippocampal regions in middle-age mice ($p<0.01$) and sustained thereafter. Conclusion: decreased microvascularization of the hippocampus with aging may impact the local supply of oxygen and nutrients, whereas diminished pericyte vascular coverage and increased RAGE expression may allow hippocampal access of circulating molecules, altogether contributing to neurodegeneration. These results point to microvasculature as a potential target to prevent age-related brain disorders.

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FLEXOR TENDON INJURIES OF THE HAND IN CHILDREN

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Background and aim of study: Injuries of the flexor tendons of the hand in children require meticulous evaluation and treatment. The aim of study is to draw attention to the difficulties of the treatment of flexor tendon injuries and to highlight the importance of anatomical knowledge and physiotherapy. Methods: In a retrospective study the authors present the most common causes and mechanism of flexor tendon injuries. They emphasise the need of different treatment concepts, indications of primary or delayed tendon reconstruction. Between 2005 and 2010 15 children and adolescent treated in the authors' institutes ranging in age from 4 to 20 years were included in the study. In all patients modified Kessler's technique was used to repair the flexor tendons. The range(s) of the movement of the children's injured finger joint(s) were investigated by a goniometer. For evaluation movements was based on the Buck-Gramcko scale. The assessment of results consisted of measurement of the motion of the metacarpo-phalangeal, distal inter-phalangeal, and proximal interphalangeal joints and graded them as excellent, good, fair, and poor. Results: The motion (function) of the interphalangeal joints in 80% of the patients were graded as excellent, in 13.3% good and in 6.7% fair. No poor result was measured. Conclusions: Flexor tendon injuries in children are rare. The modified Kessler's technique with early mobilisation is an effective technique following flexor tendon repair of the hand in children and young adolescents.

VARIATIONS OF ARTERIA RECURRENS RADIALIS

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Radial catheterization is now a method of choice in the diagnostic and treatment of coronary diseases. The loop present at the proximal segment of radial artery can be a reason for failure of such procedure and the arteria recurrens radialis can become a blind detour for the catheter. Compression of ramus profundus nervi radialis can cause a palsy of hand extensors and it can be evoked by a branch from arteria recurrens radialis, termed "leash of Henry". The aim was to specify the detailed anatomy of arteria recurrens radialis. Material and methods: 204 limbs from cadaverous materials were dissected. Results: The artery is usually a branch from the beginning of radial artery (60%), or from the bifurcation of brachial artery (35%) or directly from the brachial artery. Its diameter is approximately 1-1.5 mm. In case of brachioradial artery (14 %), it usually branched from it, in case of superficial brachioulnar artery (4 %) and other rare variants, it is always branch from the radial artery. In 90 % of cases the artery passes across the tendon of musculus biceps brachii. Its unnamed branch (termed "leash of Henry") crosses ventrally the ramus profundus nervi radialis and in 39% of cases it enters canalis suppinatorius. The loop of radial artery in fossa cubitalis was present in 1% of cases. Conclusion: The arteria recurrens radialis can cause a failure of radial catheterization if the loop is present and the "leash of Henry" can be a possible cause of radial nerve entrapment syndrome.

DISCREPANCIES AND MISTAKES IN TERMINOLOGIA ANATOMICA

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Sixteen years after publication of the last revision of the Latin anatomical nomenclature – Terminologia Anatomica – we have enough experience and hints to point to its weak spots. There are six main areas which have to taken in attention in future amelioration of TA: mistakes (e.g. articulatio sacro-coccygea is in fact a symphysis), terminological discrepancies (in adjectives, in concordant and non-corcondant atrtributes and in synonyms), anatomical discrepancies (terms of fasciae), multiplication of terms, too many synonyms (e.g. nodus lymphoideus / nodus lymphaticus / lymphonodus), identical terms for different structures (e.g. plexus pharyngeus), too long terms (e.g vena portae hepatis) and mainly missing terms (in systemic, clinical, topographic and variant anatomy). This contribution should evoke larger discussion and broader contributions to the improvement of Terminologia Anatomica.

VESALIUS IN EPONYMS

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This year, we commemorated 500-year-anniversary and 450-year-aniversary of Andreas Vesalius (1514-1564) birth and death, respectively. He is considered as a founder of modern anatomy and the author of one of the most influential books De humani corporis fabrica libri septem, issued in 1543. He was born in present Belgium as Andries van Wezel, worked at Padua University and was also an imperial physician of Charles V and Phillip II. He died after shipwreck at Zakynthos in Greece. Due to his unique personality of excellent anatomist, his surname is connected with several anatomical structures throughout the human body. We can find 9 different eponymous terms and we can conclude that only 3 of them are actively applied in current science: Vesalius' foramen and emissarium (foramen venosum ossis sphenoidalis et vena emissaria foraminis venosi) and Vesalius' ossicle (os vesalinum - tuberosity of the fifth metatarsal bone existing as a separate bone). Only the term foramen venosum is a part of Terminologia Anatomica.

CLASSIFICATION OF EPONYMS IN OTORHINOLARYNGOLOGY

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The otorhinolaryngology is a small medical branch devoted to the diseases of nasal cavity, pharynx, oral cavity, larynx and ear. Although eponyms have been excluded from the official Latin anatomical nomenclature since Parisiensia Nomina Anatomica (1955), they are still used in everyday clinical practice and some of them even do not posses their corresponding Latin counterparts. Several surnames describe more anatomical structures (Bötcher, Corti, Morgagni) and this state of art can also bring some confusion. Many clinicians and even students of medicine are not able to find the proper valid Latin term to individual eponyms. Altogether, 192 eponyms which are derived from 106 physicians and scientists were gathered. According to our system of classification, presented in 2012, they are divided into 3 groups: necessary for all physicians (class 1), necessary for otorhinolaryngologists (class 2) and useless, serving only for historians and lovers of medicine (class 3). Class 1 comprises 11 eponyms (e.g. Eustachio, Killian, Kiesselbach, Steno), the class 2 contains 16 terms (e.g. Haller, Citelli, Onodi, Shrapnell). Our survey should serve for better orientation in the eponymous terminology and could point the way how to treat them.

HAUTE COUTURE: EVALUATION OF THE PLACE OF 3D TOP MODELS IN ANATOMY TEACHING

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Objective: Learning basic Anatomical concepts and specific structures of organs or tissues has always been tough and a difficult. Due to the Anatomy courses given in first years of medical schools, students may have hard time correlating the information and digesting the basic knowledge. Such kind of problems can be overcome by utilizing visual sources interactively and internet based. Our aim in this project was making those conventional sources that can be used interactively 2D/3D to enrich the learning experience. Material and method: During the project we have worked on and pictured more than 150 conventional anatomical models and a whole body plastinate. Models were manufactured by Somso and the plastinate was made by Von Hagens. We have established a small but professional grade photography studio to picture the models and plastinated body. Imaging materials were soft-boxes, multiple cameras and variable lenses. Model pictures were taken in 360 degree by shooting 12 for each of them. A professional hardware, setup and a related software has used for 360 picturing purpose. Snaps were photoshoped and unwanted artifacts removed later on. Results: As the positive result of our project now it is possible to examine those conventional anatomical models even in more details that manufacturer intended. Examiner can rotate, zoom in or out and see important anatomical structures in Latin or English nomenclatures. Conclusion: By reaching those conventional resources through the internet, 7/24 and interactively in details can improve and enrich the learning experience of the learner and may help to keep basic knowledge last longer.

THE PROSECTION OF MALOLYAKHOVSKIY MAMMOTH - PALEOANATOMY, PALEOHISTOLOGY AND PALEOCYTOLOGY BECOME THE NEW REALITY

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Authors made from March 10 to 14, 2014 the prosection of unique anatomic object – the remains of the malolyakhovskiy mammoth which has become world widely scientific paleontologic sensation. The prosection was made during work of the international scientific symposia in the medical institute of Northeast Federal University (Yakutsk, Russia).

Radio-carbon dating of an artifact showed age about 43500 years. The remains of an animal were found in August, 2012 in the permafrost on the island Malolyakhovskiy in the Arctic Ocean. The remains of the animal's before to study was stored in the frozen state. The animal was a female sex and the characteristics of the skeleton, teeth and tusks were aged 70-80 years. The most surprising and not the corresponding trivial scientific representation was the fact of discovering in animal of liquid blood and frozen blood in vessels, both on a detection place, and at the time of dissecting in blood vessels. Authors during dissection and visual anatomic research found unique unprecedented preserving of skin, fat and muscular tissue, blood and lymphatic vessels, lymph nodes, mammary glands and other organs which were confirmed histologically. The dissection of soft tissues, muscles and blood vessels of a forward left extremity in a femoral part, in a knee joint, in a shin, in an ankle joint of foot was made. The unknown anatomic features of the body and foots of mammoth were described. The descriptive and morphometric features of animal's body were made. Anatomic research by prosection allowed establishing causes of death of an animal and some injuries and lifetime damages of animal.

RECENT PALEONTOLOGICAL FINDS NEGATE ALL KNOWN TO CIVILIZATION ANATOMICAL TECHNIQUES OF PRESERVATION AND EMBALMING

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The history of techniques of preserving and embalming of organic tissues is in the anatomy several millenniums. The most important key points of such technologies should be considered in the historical aspect three factors: drying (lyophilization), freezing (cryopreservation) and use of chemicals. The fourth method can be considered as a different combination of all of these powers. Mandatory elements of all technologies are the sterilization for prevent the most harmful and damaging biological destruction with microorganisms. However, recent paleontological findings such as pleistocenic dog, malolyakhovskiy mammoth in Yakutia (Russia) indicate that the very promising technologies can be natural-like technology, which are allow keep the animals tissue in supravital condition a few tens of thousands of years. Clearly, they may not be completely reproduced in artificial laboratory conditions. Preventing the putrefaction and the followed mummification of biological objects for a long time may be the result not only an optimal combination of physical and chemical factors and conditions. They can be the unique conservation result of thanks to powerful preservative properties of biologically active compounds that produce microorganisms breed well in permafrost. This is facilitated by a special composition of the soil, its physical and chemical characteristics. Also this is confirmed by the results of microbiological tests. The authors hypothesize that sterility combined with the permafrost is not the only and best conditions of the conserving of animals tissues. Mostly special conservation with microorganisms and their biological active living products is the basis for scientific research and development of new technologies of preservation and embalming of biological objects at the organism, tissue and cellular levels. The authors believe that the paleontology suddenly becomes one of the promising scientific areas which provide data for the development of technologies of the future.

ATROPINE INDUCED MYDRIASIS IN RATS COUNTERACTS WITH THE PENTADECAPEPTIDE BPC 157

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Aim: The aim of this study was to investigate the effect of BPC 157 on atropine induced mydriasis in Whistar albino rats. Methods: 30 Female Whistar Albino rats weighing 200-250g were randomly assigned into 6 groups, five per each group. Animals were randomized into pentadecapeptide BPC 157 and control group. Pentadecapeptide BPC 157 group animals were treated by pentadecapeptide BPC 157 ntraperitoneally (5.0 ml/kg - µg, ng, pg, fg, ag) and atropine 0.5% administered locally. Control group received saline intraperitoneally (5.0ml/kg) and atropine 0.5% administered locally. Assesment includes change in pupil diameter monitored by "Veho discovery VMS-004 deluxe" camera and radius diameter area software in 4h interval. Calibration by millimeter paper was also performed before every measurement. Results: There is a difference in time of disappearance of atropine effect between the control group rats and rats treated with BPC 157. Conclusion: Considering the results obtained we suggest that Pentadecapeptide BPC 157 is effective and shortens the time needed for a pupil to return to normal state after initial treatment with atropine. We presume that effect is dependent on the action of the NO system.

ANATOMIC NEURONAVIGATION TO THE PUDENDAL NERVE BY MEANS OF LAPAROSCOPY

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Aim: The aim of this study was to optimize a minimal invasive laparoscopic electrode implantation to the pudendal nerve, which is attractive for neuromodulation therapy, offering a promising therapeutic approach to patients affected by bladder dysfunctions as overactive bladder or urinary incontinence. Methods: In alcohol-glycerin fixed human specimens, the anatomical layers of the pelvis were dissected and the courses of blood vessels, nerves and ligaments as well as their relation to bony structures were documented photographically. Simultaneously, the laparoscopic access to the pudendal nerve was readjusted for documentation and test of feasibility. Furthermore, the best landmark for intraoperative neuronavigation to the pudendal nerve as well as the best position fixing the electrode was selected. Results: The so called "white line" (Arcus tendineus musculi levatoris ani) serves as optimal landmark for the laparoscopic exploration. The intrapelvine part of the internal pudendal artery (IPA) facilitates the exploration of the pudendal nerve´s trunk, which lies on the sacrospinal ligament in vicinity to the ischiadic spine, medially to the artery. The electrode should be placed directly laterally to the nerve, fixed on the sacrospinal ligament.Conclusion: Due to our results an intraoperative navigation system can be implemented to guide the laparoscopic instruments to the marked structure to minimize the invasiveness and reduce the operating time. The best shape of the electrode (bar-shaped, saxophone electrode around the nerve) is in discussion and has to be modified.

MORPHOLOGICAL CHANGES OF GASTRIC MUCOSA IN FUNCTIONAL DYSPEPSIA PATIENTS

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Aim: to assess histological changes of gastric mucosa in patients with clinically different types of functional dyspepsia. Methods: Adult patients (18-65 years) with confirmed diagnosis of functional dyspepsia were eligible to participate. Biopsy specimens were taken from stomach due to the Houston-updated gastric biopsy sampling protocol for the next histological examination. One expert gastrointestinal pathologist assessed all tissue samples. Atrophy was assessed due to Operative Link for Gastritis Assessment (OLGA) and metaplasia - due to Operative Link on Gastric Intestinal Metaplasia (OLGIM) staging systems. All patients were tested for H. pylori using two methods (rapid urease test and by morphological examination).Results: 75 patients were recruited, 42 of which had epigastric pain (I group) and 33 – postprandial distress syndrome (II group) due to Rome III criteria. Antral and corpus atrophy were detected at the same frequency in both groups ($p>0.05$), however the stage of atrophy didn't exceed I in all cases. Complete antral metaplasia was revealed in 11 (26.2%) patients of the I group and 11 (33.3%) patients of the II one. Incomplete antral metaplasia was seen in 2 (4.7%) patients of the I group and 2 (6.1%) patients of the II one. No cases of corpus metaplasia or dysplasia were found.Conclusion: Our study didn't reveal statistically significant correlation between stage of gastritis, atrophic or metaplastic changes and clinical symptoms of functional dyspepsia.

APPLICATION OF THE THREE HIT THEORY IN PACAP HETEROZYGOTE MICE: MATERNAL SEPARATION AND CHRONIC STRESS INFLUENCE FOREBRAIN-CRF AND CPEW-UCN1 IN AN INVERSE MANNER

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Introduction: According to the three hit theory genetic, epigenetic and stress factors lead to major depression. Mice-lacking (KO) pituitary adenylate-cyclase-activating poly-peptide (PACAP) show depression-like symptoms. Maternal separation (MS) inducing epigenetic changes and chronic variable mild stress (CVMS) in these mice could provide a useful depression model. Forebrain corticotropin releasing factor (CRF) systems and urocortin1 (Ucn1) in the central projecting Edinger-Westphal nucleus (cpEW) have been implicated in mood disorder pathophysiology. Aims: The validation of the three hit theory in mice, by studying the –(mal) adaptation of the – hypothalamus-pituitary-adrenal (HPA) axis. Dissecting the contribution of CRF in the oval nucleus of the bed nucleus of the stria terminalis (BNSTov), the central nucleus of the amygdala (CeA), -and that of cpEW- Ucn1. Methods: Litters from PACAP heterozygote pairs were exposed to MS vs. controls. Half of adult offspring was subjected to CVMS. The model was validated by evaluating the HPA-axis activity.-CRF, Ucn1 and FosB immune-fluorescence was performed. Results indicate that CVMS most effectively increased adrenal weights and corticosterone titers in MS mice. MS mice upon CVMS had increased CRF-cell counts and specific signal density (SSD) in the BNSTov. In the CeA, CVMS-induced rise CRF-SSD was observed only in non-MS mice. In MS, the CVMS induced rise of Fos Bin Ucn1 neurons. Conclusions: The increased BNSTov-CRF and decreased cpEW-Ucn1 neuronal activity suggests inverse alterations in these areas, which may contribute to the psychopathology. The three hit theory of depression in PACAP heterozygote mice seems to be applicable to study the pathophysiology of stress-related mood disorders.

CORONARY CIRCULATION ANOMALIES ASSOCIATED WITH CONGENITAL HEART MALFORMATIONS: ENDOVENTRICULAR ORIGIN OF SINGLE CORONARY ARTERY AND UNROOFED CORONARY SINUS SYNDROME

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This report is related to the case with endoventricular single coronary artery origin and other one with absence of coronary sinus i.e. unroofed coronary sinus. Profound postmortal dissection analysis of newborn hearts with complete transposition of great arteries, respectively common arterial trunk and a-v canal is done.Primordial pattern i.e. anomalous position of single coronary ostium placed at the endocardial surface of the vestibule of aorta is continuous with a large transmural sinusoid till its end as aneurismal elevation at sternocostal surface of the heart, epimurally. It is located at the initial part of right atrioventriclar sulcus. It further gives rise to the three major coronary branches, the right, the anterior descending, as well as to the circumflex one, that runs to the left through the sulcus behind the great arteries. Besides this primordial case with major anomaly in origin of the coronary artery, in other case is found unroofed coronary sinus i.e. lack of atrial wall of coronary sinus, as well as partial anomalous pulmonary venous connection. In those cases with CHM anomalies, major anomaly is in origin of the coronary artery circulation. These cases are of importance in reconstructive surgery for the congenitally heart disease.

QUALITATIVE AND QUANTITATIVE ANALYSIS OF THE HUMAN CAUDATE NUCLEUS ASPINY NEURONS

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Aim: A qualitative analysis of the human caudate nucleus neurons involves description of somatic shape and size, number of primary dendrites and their branching order, dendritic density, presence and distribution of spines. According to this scheme, neurons are classified into groups. The aim of this study was to determine wether a quantitative analysis, implying measuring neuronal properties which define their morphology, can confirm current qualitative cell classification. Methods: Thirty human brains, free of neurological diseases, which were obtained from medico-legal forensic autopsies of adult bodies, were used in this study. Coronal sections of the Golgi impregnated neurons in the precommissural caudate nucleus head (100 μm thick) were analyzed using a light microscope "Leica DC 100". Impregnated cells were recorded and transformed into digital images, which were reconstructed and quantitatively analyzed using the public software Image J. Results: In the sample of 351 neurons, 28.49% (100) were aspiny, recognized by the absence of spines on neuronal dendrites and bodies. After qualitative analysis, neurons were classified into two groups, type 1 and type 2 aspiny cells. Using eight morphometric parameters, five morphological properties of neurons were quantified. According to the dendritic field area,

type 2 aspiny neurons were divided into subgroups: small and large cells. In this sample of 100 aspiny neurons, 35% (35) were small and 55% (55) large neurons. Conclusion: By performing an adequate statistical analysis, we concluded that suggested groups of aspiny neurons differ enough in their morphology to warrant and complete the current classification of the aspiny cells in the human caudate nucleus.

ANTHROPOMETRIC MEASUREMENT AND ANALYSIS OF THE LOWER FACE IN RHINOPLASTY PATIENTS

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Aim: Faces that are considered attractive have certain proportions and relationships in common. These proportions must be thoroughly analyzed before any cosmetic facial surgery. Since lower face dimensions have a visual impact on the perception of nasal beauty, we aimed to describe the average values of lower face anthropometric measurements in patients who applied for rhinoplasty, and to compare these values with measurements of individuals who are pleased with their nasal appearance. Methods: A Turkish population of 252 rhinoplasty-negative individuals (119 male, 133 female) and 171 rhinoplasty patients (83 male, 88 female) were included in this study as rhinoplasty and control groups. Individuals who were satisfied with their nasal appearance were included as the control group. The rhinoplasty group included patients who underwent aesthetic rhinoplasty. Using the photographs of the facial profile, seven vertical measurements of the lower face were taken. Results: In the rhinoplasty group, almost all measurements were greater in males. The only variables with no gender differences were the lower and upper vermilion heights. The largest portion of the lower face was occupied by the chin and the smallest by the lower lip in both sexes. There were no significant differences in the measurements between rhinoplasty and control groups. Conclusion: This study provides reference material for the evaluation of the lower face when planning for a cosmetic nasal surgery. Besides, our results show that there is no significant difference in lower face dimensions between rhinoplasty patients and normal population.

INVESTIGATION OF THE BIFURCATION LEVEL OF COMMON CAROTID ARTERY

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Aim: Common carotid artery bifurcation usually lies at the level of C-4 vertebra or the upper border of the thyroid cartilage, but it may occur as low as the level of T-3 vertebra or as high as hyoid bone. In a few instances common carotid artery has been found to be absent; instead, the external and internal carotid arteries arise directly from the innominate artery or the aortic arch. It is extremely rare that the common carotid artery ascends in the neck without undergoing bifurcation. Methods: In the present study these variations were evaluated on the angiographic images of 38 male and 21 female, a total of 59 patients attended to Department of Radiology in Baskent University Faculty of Medicine. Variations in the anatomical structure of common carotid artery and its bifurcation levels were examined. Results: The levels of bifurcation of the common carotid artery; two bifurcations were observed at the level of C2 vertebral body, one bifurcation at C7 vertebral body and the most common bifurcation was observed at the level of the intervertebral disc between C4 and C5 vertebra bodies (%31,6) in male. In females, the most commonly observed bifurcation was at C4 vertebral body level (right side; %26,3 and left side%15,7). In addition, three bifurcations were between the bodies of C2 and C3 vertebrae and two bifurcations were at the level of C6. Conclusion: Detailed information on the branching pattern of the common carotid artery and its bifurcation levels will prevent the clinician causing a vascular injury during catheterization in radiological interventions or surgical approaches.

FETAL TOPOGRAPHY OF THE HEART IN THE EARLY FETAL PERIOD OF THE HUMAN ONTOGENESIS

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Modern development of medical technologies allows speaking about a intranatal developing fetus as about the patient with the features. Respectively studying of features of the human heart topography in the early fetal period of ontogenesis became a research objective. The this research is based on studying of a section material of 105 human fetuses of both sexes of 16-22 weeks of the development received as a result of interruption of normally proceeding pregnancy at healthy women. In work methods of macro-microscopic preparation, method of sections according to Pirogov and a histotopographical method are used. It was revealed that throughout the studied age period there is an expansion of range of the upper, lower and right borders of heart with saving of the stable provision of left border, thus by 22 weeks heart is displaced closer to a forward chest wall. The fetus heart syntopiya has both individual, and the age distinctions which are showing in relationship of heart with thymus and the left lung, and also in increasing of all distances to surrounding bodies ranging from 5% to 69%. The topography of an interatrium septum is characterized by its difficult spatial orientation in the sagittal and horizontal planes: it is inclined forward, down and to the right. Thus, results of research may be used in fetal surgery and in the prenatal developing child examination.

INFLUENCE OF CHANGES IN NUTRITIONAL PROTOCOL BETWEEN GENERATIONS ON VAGINAL SMEAR CHARACTERISTICS

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Aim: Changes in feeding protocol between generations have influence on metabolic functioning, especially on female reproductive physiology. The aim of the study was to determinate impact of mothers` nutrition and nutrition of offspring on characteristics of vaginal smears and lipid levels in offspring. Methods: Nine weeks old female Sprague Dawley rats (n=10) were randomly divided in two groups: high fat diet (HFD, n=5) group which was fed during 6 weeks with high content of saturated fatty acid food and control diet (CD, n=5) group which was given standard laboratory chow during the same period. Offspring from both groups were randomly divided in two subgroups after coupling and lactation period, subsequently there were four groups of offspring with different feeding protocol: CD offspring of CD mothers (n=6), HFD offspring of CD mothers (n=6), CD offspring of HFD mothers (n=6), HFD offspring of HFD mothers (n=6). All rats were weight and blood was collected at the age of 18 weeks, when vaginal smears collection was started during 15 days period. Materials were stained following May-Grünwald-Giemsa staining protocol and observed under light microscope. Results: Groups in which the nutrition protocol between mothers and offspring was changed showed significant

changes in characteristics of vaginal smears, whereas the same nutrition protocol between mothers and offspring resulted in normal characteristics of vaginal smears. Significant higher triglyceride level was in HFD-HFD and cholesterol level in CD-HFD group. Conclusion: Maternal HFD consumption predisposes offspring to increased risk of developing metabolic abnormalities and estrus disorders.

ANATOMICAL VARIATIONS IN THE PATTERN OF THE CORONARY SINUS TRIBUTARIES

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The human coronary sinus is a major component of the cardiac venous system that serves as an anatomic landmark as well as a conduit for many diagnostic and therapeutic procedures in cardiology. The objective of this study is to explore the anatomical variations of the coronary sinus and its tributaries. Morphological features of the veins have been studied on 20 adult human cadaveric hearts, both sexes, 25 to 70 years of age. The hearts had been fixed in formalin solution and have been studied by manual dissection and by ink-gelatine methods. The length of the human sinus varied from 20 to 44 mm (average 29.6±4.6 mm). The diameter of the coronary sinus at its opening into the right atrium was 7 to 13 mm (average 8.5±1.5 mm). The most frequent pattern of venous drainage into the coronary sinus are: the great cardiac vein, the middle cardiac vein, the posterior veins of the ventricle and the oblique vein of the left atrium in 60% of the specimens. The small cardiac vein was present only in 10% of the specimens. Myocardial bridges of the cardiac veins were found in 3 specimens over the great cardiac vein during its course in the anterior interventicular sulcus. The knowledge of cardiac veins variation will contribute to better understanding and interventions in heart vascular disease.

RABBIT HAEMORRHAGIC DISEASE: IMUNOSSUPRESSION OF INFECTED YOUNG RABBITS CHANGE THE MICROANATOMY OF THE LIVER

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European rabbits are the hosts of the rabbit hemorrhagic disease virus (RHDV) which is responsible for the death of 90% of adult rabbits as a result of fulminant hepatitis (target organ of viral replication) and haemorrhagic diathesis within 1 to 3 days after infection. Interestingly, young rabbits (4 weeks) are completely resistant to infection, developing only a subclinical disease and a focal necrotic hepatitis. Our previous works in RHD allow us to postulate that the different outcome of the infection is due to a different interaction between RHDV and the immune system of both age groups. To evaluate this hypothesis, we have immunosuppressed 10 young rabbits with methylprednisolone and 1 week later, we infected them with RHDV, by intramuscular or by intraoral/ intranasal routes. All immunosuppressed and infected rabbits died between 36-72 hours after infection and showed gross lesions suggestive of RHD: hepatomegaly, liver discoloration, and multifocal hemorrhages in various organs. The histo-pathological analysis of the liver showed a marked positive labelling for the virus and a widespread necrosis and apoptosis of the liver parenchyma, as observed in infected adult rabbits. We conclude that immunosuppression change the histology of the liver of RHDV-infected young rabbits and convert them into hosts as susceptible to fatal RHD infection as naïve adult rabbits are. Therefore, we propose that natural resistance of young rabbits to RHDV-infection is derived from their innate immune response.(This work was funded by FCT -Portugal, grant nº PTDC_CVT_122905_2010, COMPETE and FEDER. Luzia Teixeira was supported by Fundo Social Europeu and MCTES through POPH-QREN- Tipologia 4.2.)

HAVERSIAN SYSTEMS IN DISTAL HUMAN FIBULA - PRELIMINARY STUDY

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Fractures of distal fibula are very common. The objective of this study was to describe Haversian systems in cortical bone by determination the course of the central vascular canals and as a result, also the course of osteons in individual parts of the distal fibular end; and subsequently to identify a possible correlation with the course of the typical fracture lines of fibular fractures. The aim of the computational analysis was to answer the question whether distribution of the principal stresses of the FEM model corresponds to the occurrence and course of systems of osteons. The bone in 5 dry specimens of the distal fibula from collections of the Department of Anatomy was grounded and evaluated. The bones were not specified in terms of age or gender. Only bones of adult individuals, where epiphyseal plates were no longer observed, were used. For better understanding of the bone structure in the region 10 dry specimens were analyzed by uCT. The depicted courses of osteons were compared with the course of individual typical fracture lines of the most common classifications of fibular fractures. For a bio-mechanical analysis the FEM method was applied. Our preliminary study showed that the systems of osteons in distal fibula in principle correspond to the distribution of surface tensions illustrated by the biomechanical model. Results of this work will be used for analysis of distribution of surface tension and course of most common fracture lines in the distal fibula. (Supported by the OPPC CZ216/3100/24018 and GAUK 790214/2014)

LUMBOSACRAL TRANSITIONAL ANATOMY TYPES AND DISC DEGENERATIVE CHANGES

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Background and purpose: The relationship between presence of lumbosacral transitional vertebra (LSTV) and disc degenerative changes is unclear. The aim of the study is to investigate the relation between different types of LSTV and disc degenerative changes at the transitional and at the level above. Material and methods: 63 patients from 200 adults with low back pain who preformed MRI examination of the lumbosacral spine, positive for LSTV were included in the study. Annular tears, disc degeneration (Phirmann classification) and disc herniations were evaluated and graded. Results: The severity of disc degeneration at the transitional level and the level above correlated with the type of LSTV. Severe disc degeneration was most frequent in articulated connection LSTV type at the transitional level and in osseus connection LSTV type at the level above. These

changes were more frequent in unilateral subtypes of LSTV. High prevalence of disc herniations was observed in articulated connection LSTV type at the transitional level and at the level above. Higher prevalence of disc herniations was characteristic for unilateral articulated connection LSTV type. Conclusions: Increased mechanical connection (osseus bridging) vs articular bridging of the lumboscral transitional vertebra to the sacrum protects the disc at the transitional level and produces greater stress to adjacent cephalad segment. Unilateral or asymmetric connection of the lumboscral transitional vertebra to the sacrum produces greater stress to the disc at the transitional level and the level above compared to the bilateral or symmetric connection.

ADDITIVE MANUFACTURING AND CAD/CAM APPLICABLITY IN TEACHING ANATOMY

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Aim: To determine the applicability of using additive manufacturing technology and CAD/CAM software in teaching anatomy. Methods: This paper presents several CAD/CAM methods applied in anatomic region of the nasal cavity and paranasal sinuses. Results: Participants emphasized the great benefit of the application of CAD / CAM model of the paranasal sinuses in the teaching of anatomy. Conclusion: By using this method, a significant improvement in the teaching of anatomy has been made. CAD/CAM results have demonstrated that including specific anatomical models in teaching can greatly contribute to studying and researching anatomy.

MORPHOLOGICAL CHARACTERISTICS OF DENTAL PULP AFTER CHEMICAL BLEACHING OF TEETH

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Aim: The purpose of this study was to determine the possible morphological changes in the dental pulp of the previously chemically bleached vital teeth. Methods: The study included 3 groups, each one consisting of 6 teeth, for which existed an indication for extraction, because of onthodontic treatment. The teeth of the control group were not exposed to the bleaching treatment, while the teeth of the other two groups were chemically bleached with bleaching product containing 35 % hydrogen peroxide, 5% potassium nitrate and 1.1% fluoride. Teeth bleaching in one group lasted 15 minutes, while in the other group 30 minutes. Dental pulp paraffin sections were stained according to the methods of hematoxylin-eosin and Masson. Results: Histological analysis of dental pulp in chemically treated teeth showed moderate change in the representation of the extracellular matrix components in favor of collagen fibers. This phenomenon of the collagen fibers predomination was observed in the root canal pulp and in the coronal pulp too. The presence and structure of blood vessels of the pulp fully meets histological findings from the control group. Layer of odontoblasts was almost completely intact. The only difference was that after the chemical treatment of the teeth, were observed small defects in the continuity of odontoblasts layer. Conclusion: Our results showed that the chemical bleaching teeth causes no particular change in the structure of the dental pulp.

AGE SPECIFIC ALTERATIONS OF CORTICAL AND TRABECULAR BONE MASS DENSITY OBSERVED IN THE INDIVIDUALS RESIDING IN THE PRYKARPATTYA REGION

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Aim of Investigation: Literary sources attest to the fact that the density of osseous tissues is age dependant. The use of computer tomography (CT) has allowed defining the bony tissue density including the different parts of spine. No literature data regarding the use of computer tomography in examining the residents of the Prykarpattya region to define the density of spine has been known yet. Therefore, the aim of investigation was to study the cortical and trabecular layer density of thoracic and lumbar vertebrae as exemplified by the Prykarpattya residents of different age groups. Methods: The research has been carried out at the premises of the Radiology Unit within the Municipal Clinical Emergency Hospital in Lviv. The multispiral computed tomography scanner GE CT/e Dual has been used. 48 individuals aged 8 - 75 have been examined. The cortical and trabecular bone layer density in the 12th thoracic vertebra (Th12) and the 1st lumbar vertebra (L1) have been explored. Results: The analysis of the trabecular layer density has disclosed the progressive increase of the bone density in the T12 and L1 vertebrae in the period of childhood and teenage irrespective of gender. The mentioned above indicator has been confirmed to decrease starting from the middle years being of its lowest value at the elderly age. The highest value of the bone density in the T12 and L1 vertebrae has been fixed between the teenage and the age of 35 followed by further lowering. No substantial difference has been revealed while comparing the cortical and trabecular layer density in the T12 and L1 spondyles. Conclusion: 1. The cortical and trabecular layer density is unaffected by gender but age specific; 2. The increase of vertebral tissue density has been observed in the period of childhood and elderly age followed by its gradual decrease. 3. No significant difference between the density of T12 and L1 vertebrae has been disclosed.

ANATOMIC AND ULTRASOUND THYROID BODY APPROXIMATION

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Aim of Investigation: So called acoustic routes are the only available areas for the ultrasound investigation. Thus, the space orientation of the under study structures is extremely important. The thyroid body location in a specific topographic area requiring the acoustic routes for its examination complicates the ultrasonography interpretation. That is why the issue of the anatomic and ultrasound thyroid approximation for each route has been raised. The research objective was to explore the characteristics of the visualized anatomic structures by means of applying the anatomic and ultrasound thyroid body approximation made in different areas. Methods: The cervix photoprints and the scanning images of thyroid body made under the maximum possible approximate terms with the consideration of sectional direction have been used for the anatomic and ultrasound approximation. The received images have served the main source for the identification and description of the thyroid peculiarities and their interrelation with the cervix structures.

Results: The horizontal scanning at different levels has provided the most comprehensive information on the thyroid location, form and its correlation with trachea, esophagus, vascular nerve tracts and neck muscles. The anatomic and ultrasound approximation allows the specification of surfaces, part edges and is required for the identification of cervical vessels. The sonograms having been received in the axial area at the angle of 15°-30° towards the sagittal area estimate the anterior and posterior surfaces as well as the upper and lower poles of laterals. The anatomic and ultrasound approximation in the sagittal area made at different levels provides with the objective assessment of medial and lateral edges, their correlation with tracheal ring and cephalic artery. Conclusion: The anatomic and ultrasound approx-imation assures the keen perception of the thyroid ultrasonography.

THE ANALYSIS OF ENZYMES MATRIX METALLOPROTEINASES-2 AND 9 IN ATHEROSCLEROSIS

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The members of the matrix metalloproteinase (MMP) family play a crucial role in angiogenesis and vascular remodeling and are involved in the pathogenesis of vascular diseases such as atherosclerosis, varicose veins, hypertension, abdominal aortic aneurysm, preeclampsia, etc. Alterations in vascular tone are usually a result of changeable endothelial cell function, as well as increasing activity of neurohormonal stimuli or altered sensitivity of vascular smooth muscle. Chronic changes in vascular function lead to structural changes in the blood vessel architecture. The aim of our study was to examine the values of enzyme matrix metallo-proteinase-9 in urine in patients with atherosclerosis of carotid arteries, undergoing surgery, and compare to controls (healthy volunteers). Patients and methods: we analyzed 40 patients with atherosclerosis who were undergoing the surgical procedure. The method of enzyme immunoassay (ELISA) was used to determine enzymes expression of matrix metalloproteinase-2 and 9 (MMP-2 and 9). Statistical data were calculated using computer program Statistica 7.1. Results: The patients with atherosclerosis had a statistically significantly increased level of MMP-2 and 9 in the urine in comparison with healthy volunteers. Conclusion: Our data has showed a large increase in the enzyme MMP-2 and 9 in the urine of atherosclerotic patients, which can be an easy marker for the monitoring of the development of atherosclerosis.

ASSESSMENT OF THE REPRODUCIBILITY OF THE MORPHOLOGICAL PATTERNS OF PALATAL RUGAE FOR HUMAN IDENTIFICATION

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Aim: This study aimed to determine the morphometric changes that occur to palatal rugae during orthodontic treatment and the relevance of such morphometric changes to the use of palatal rugae in human identification. Methods: fifty pairs of pre- and post-orthodontic treatment dental cats were use collected. Palatal rugae patterns were compared between each pre-treatment cast and it's post-treatment counterpart to reveal various morphometric changes. Moreover, post-treatment casts were duplicated and the dentitions in all casts were covered by tape. Then a matching test of palatal rugae patterns was performed in which our ability to match each post-treatment cast with it's duplicate was compared with our ability to match that post-treatment cast with it's pre-treatment counterpart. Statistical analysis of the results of the second part of the study was done using paired student-t- test. Results: several morphometric changes occurred due to orthodontic treatment including segmentation (22%), unification (20%), change in orientation (6%), change in shape (6%), change in length (28%), antero-posterior displacement of medial end of ruga (54%), antero-posterior displacement of lateral end of ruga (60%), medio-lateral displacement of medial end of ruga (20%), and change in ruga volume (54%). Moreover, the percent of correct matches were significantly higher when matching post-treatment casts with their duplicates than when matching post-treatment with pretreatment casts. Conclusions: Orthodontic treatment inflicts various morphometric changes on palatal rugae patterns. These changes do not seem to affect the individuality of palatal rugae patterns. However, such morphological changes might complicate palatal rugae-based human identification.

A MORPHOMETRIC STUDY OF SACRAL HIATUS: IN RELATION TO CAUDAL EPIDURAL ANESTHESIA

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Aim: The Study was carried out on 100 dry human sacra to know the Anatomical variations of Sacral hiatus and use this information to improve the success of Caudal Epidural Anesthesia. Observations: Different shapes of sacral hiatus were observed which included- Inverted U (56%), Inverted V (14%), Irregular (16%), Dumb-bell (10%), Bifid (2%) and Elongated (2%). Results: The apex of the sacral hiatus was most commonly found at the level of 3rd sacral vertebrae in 62%. The mean length of sacral hiatus was 25.2mm. The mean anteroposterior diameter of sacral canal at the apex of sacral hiatus was 5.53mm. The mean distance between sacral cornu at the base of sacral hiatus was observed to be 19.5mm. Conclusion: This study was done to clarify the anatomical variations of sacral hiatus using bony landmarks of sacrum for improving the reliability of Caudal Epidural anesthesia and to improve its success rate and reduce the complications and failure rate.

THE STYLOID PROCESS ELONGATION IS CORRELATED WITH SKULL BASE OSSIFICATION? AN ANATOMICAL STUDY IN GREEK SKULLS

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Background: The study determines the variability of the styloid process (SP) length, the ossification of pterygospinous (Pts) and pterygoalar (Pta) ligaments in Greeks, investigates possible correlations by the gender and age, evaluates the side asymmetry, highlighting clinical implications. Materials and methods: One hundred and sixty-four dry adult skulls subdivided in gender and age groups were examined. The lengths of 290 SPs were measured and the existence of incomplete and/or complete Pts and Pta bars and the paracondylar processes (PPs) was also recorded. Results: The lengths of right and left SPs ranged from 4.2 -70.2 and 4.0- 69.0 mm. SPs were classified as short <18 mm, normal 18-33 and elongated > 33mm. Elongated SPs were detected in 29.9%. A complete Pts and Pta bar was found in 1.8% and a complete Pta bar in 4.9% (right) and in 1.8% (left). The

incomplete Pts and Pta bars were observed in 5.5% and 20.7% (right) and in 4.3% and 25% (left). The PPs were found in 23.8% (right) and in 28.7% (left). The PPs coexisted with Pts and Pta bars in 1.8% and 12.2% respectively (all structures were detected in 1.8%). SP elongation in coexistence with PPs was found in 2.4%. No correlation was established between SPs lengths, gender and age. Side asymmetry was found in elongated SPs (p=0.016). No correlation existed between the presence of Pta and Pts bars and the side or gender. Conclusions: Our study adds important information about the SP length, the existence of Pta and Pts bars, the PPs and their diversities in Greeks.

AORTIC ARCH BRANCHING VARIATIONS: RETRO-ESOPHAGEAL RIGHT SUBCLAVIAN ARTERY

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Aim: Retroesophageal right subclavian artery (RERSA) has significant clinical importance. In the present study 5 cases of a RERSA are described. Methods: Anatomical dissection of 81 formalin-embalmed cadaveric specimens of both genders (34 male, 47 female). Results: A total of 5 RERSA cases (2 male, 3 female) were revealed. All cases were accompanied by a right non-recurrent laryngeal nerve. In two cases a common stem for the right and left common carotid arteries was also present. In one case a. thyroidea ima (Neubauer) artery, arising from the lower third of the right common carotid artery also co-existed, supplying the isthmus and the right lobe of the thyroid gland. Conclusion: The aortic arch branching pattern shows numerous variations. The aberrant right subclavian artery (ARSA), as last branch of the aortic arch, has an incidence of 0.13-25% in the general population. The incidence is increased in Down syndrome (3.6-37%). The combination of an ARSA and a common stem for the common carotids is found in 0.7%. The ARSA may course in front of the trachea, between the trachea and the esophagus or behind the esophagus, thus named retroesophageal (RERSA), as in our cases. A non-recurrent right laryngeal nerve is almost always observed. ARSA (and RERSA) may cause symptoms like dysphagia, dyspnea from tracheа-bronchial compression and hemorrhage from aorto-esophageal fistulas. They may also complicate procedures like tracheostomy, nasogastric intubation and intravascular maneuvers.

ACCESSORY MUSCLES IN THE ARM AS A POTENTIAL CAUSE OF NEUROVASCULAR STRUCTURES ENTRAPMENT ANATOMICAL STUDY ON 81 CADAVERS

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Aim: Aim of this study was to evaluate the incidence of accessory muscular bands of the anterior compartment of the arm that may compress neurovascular structures thus causing entrapment syndromes. Methods: Both arms of 81 cadavers (34 men and 47 women) were dissected in our Laboratory. Any accessory muscular fascicles in the anterior compartment of the arm were encountered. After careful dissection the relationship between each accessory muscle and adjacent neurovascular structures was determined. Results: Five out of the 162 cadaveric arms examined (3.1%) presented a supernumerary muscular band in the anterior compartment. Specifically, these variations were found in three left and two right arms, which belonged to 4 male and 1 female specimens. In the first case the accessory muscle formed a musculo-aponeurotic tunnel in the mid arm for the passage of the median nerve, the brachial artery and vein, the ulnar nerve, and the medial antebrachial cutaneous nerve. The second muscular fascicle was running just over the median nerve. In the rest three cases the accessory muscular bundle was found bridging the median nerve, the brachial artery and vein. Conclusion: The possibility of those muscles anomalies should, therefore, be considered when in any patient, a high median or ulnar or medial antebrachial cutaneous nerve paralysis exists with symptoms of lower brachial artery or brachial vein compression. Also, these muscles should not be mistaken for tumors on MR imaging of the arm.

ANATOMIC VARIATIONS OF THE LATERAL FEMORAL CUTANEOUS NERVE- CASE SERIES AND CLINICAL SIGNIFICANCE

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Aim: The aim of this study is to highlight the existing variability of the lateral femoral cutaneous nerve (LFCN) origin, course and distribution pattern. Methods: During routine dissection of the pelvic and femoral region of formalin-fixed cadavers, at the Lab. of Anatomy, Aristotle University of Thessaloniki, LFCN was found and documented. Results: Four cases of variant LFCN were encountered. In the first case, two branches were observed in the right side; the anterior one originated from the femoral nerve and continued as the anterior branch of LFCN, whereas the posterior one had the typical origin of LFCN and distribution pattern of the posterior LFCN branch. In the second case, right LFCN had the same origin as previously described, while at the level of IL, the anterior and posterior branches were divided resulting in the presence of four nerve branches below the inguinal ligament (IL). In the third case, trifurcation of the left LFCN prior to the IL was observed. The fourth case presented a variant left LFCN which after providing an accessory anterior femoral cutaneous nerve and an accessory LFCN branch, anastomosed with a branch of the genitofemoral nerve below the IL, giving off six terminal sensory branches. Conclusion: Variant patterns of LFCN anatomy constitute a challenge for the clinician and surgeon of the area, as modified symptom-atology is expected after nerve injury or entrapment, a syndrome known as “meralgia paraesthetica”.

BRAIN PLASTINATION AFTER MR TRACTOGRAPHY AND KLINGLER´S FIBER DISSECTION TECHNIQUE CREATING 3-D MODELS FOR NEUROANATOMY TEACHING

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Background: The Klingler fiber dissection technique is a classical anatomical procedure used in the study of the human brain white matter tracts. It involves the dissection of successive layers of white matter, providing a better understanding of its tridimensional configuration. Current MRI techniques such as tractography and diffusion tensor imaging represent a form of virtual dissection of the living brain, but unfortunately without a resolution as high as the Klinger technique. At last, plastination is a well-established fixation, dehydration, impregnation and hardening technique, easily applicable to organic tissues. It allows the creation of clean,

resistant and accurate anatomical models that are extremely useful in the study of Neuroanatomy. It has been frequently used in brain slices, but seldom in the study of the brain tridimensional structure. It is the aim of the present study to combine these 3 techniques in the same material: DTI/ Tractography, anatomical fiber tract dissection followed by plastination, in order to build an accurate, high definition 3D model of the white matter structure of the human brain. Methods: Four human brains were sequentially submitted to: 3TMRI based DTI/Tractography, fiber dissection according to Klingler´s technique and plastination. Results: The main projection, intra and inter-hemispheric association white matter tracts were identified, referenced, compared between techniques and are presented. Conclusions: Combining radiological information with anatomical dissection and preservation of biological tissues we can obtain durable 3D anatomical models of white matter tracts, applicable for Neuroanatomy and Neuroscience teaching.

DTI/TRACTOGRAPHY OF THE HUMAN NUCLEUS ACCUMBENS – IMPLICATIONS FOR PSYCHOSURGERY

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Background: The Human Nucleus Accumbens (Acc) has become an important target for deep brain stimulation (DBS) in refractory neuropsychiatric disorders such as Obsessive-Compulsive Disorder and addiction. In animals, the Acc is divided in a ventromedial shell, associated with the limbic system and a central core, related to the motor system. This dichotomy is not however clearly seen in humans. Previous studies performed by our group, in cadavers, established the 3D-stereotactic anatomy of the nucleus and revealed a subcommissural extension of the Acc, which could correspond to the shell described in the rat. Now it is our purpose to perform a characterization of the Acc in vivo, using high-field MRI and Diffusion-Tensor-Imaging/Tractography. We also apply this technique to segment the nucleus into a core and shell division, given the importance of the exact identification of targets in psychosurgery. Methods: T1-weighted 3TMR images were acquired in 10 healthy volunteers and 32-direction DTI was obtained. Seed masks for the Acc were generated using FreeSurfer and probabilistic tractography was performed using FSL. The probability of connectivity between seed voxels and several brain areas was determined and subjected to k-means clustering analysis in order to define 2 regions. Results: The Acc could be segmented into two distinct regions in all cases. The preferential connectivity between these 2 regions and other brain areas is presented and its correlation to the previous post-mortem studies is established. Conclusions: Advanced MRI techniques allow the in vivo segmentation of the human Acc and represent an additional and useful tool in the precise and safe target definition for DBS.

AGE RELATED CHANGES OF MUSCLE MASS, STRENGTH AND PERFORMANCE

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Skeletal muscle is a very dynamical tissue. Because of its ability to shorten and produce force we are able to move and perform all the activities required in daily lives. Between maturity and old age human beings show about 40% decrease in muscle mass and even greater decreases in the development of maximum force and power, and muscle aging is multifactorial process. Physical frailty, with the accompanying effects on mobility and increased incidence of the falls, is one of the most prominent manifestations of old age and represents a primary factor limiting an elderly person's chances of living independently. Contributing to physical frailty are skeletal muscle atrophy, declining strength, increasing fatigability and increasing fatigability and increasing susceptibility to injury.

OPINIONS OF TURKISH POPULATION ON WHOLE BODY AND ORGAN DONATION

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Aim: Dissection on human cadaver still keeps its importance in medical curriculum. Their experiences in the anatomy laboratory and the time they spent there makes the medical students feel themselves as doctors at the beginning of their education and helps them to get used to the notion of death. Unfortunately the number of human cadavers available for medical research and education as well as organ transplantation is limited. Obtaining human cadavers keeps on being a great problem especially in middle-east countries. Religious factors, socio-economical status, education, marital status or age are probably the main factors those effect body donations. The aim of the present study is to evaluate the opinions of Anatolian population on body donation and to evaluate the factors which results in opposition to dead body donation. Methods: Randomly selected 670 individuals aged between 18 – 85 years were participated to the study. All the subjects were given a questioner composed of 38 questions. Results: 23.8% of the individuals declared that they could donate their body for medical education while 57.3% of them did not. On the other hand 65.4% of the participants were willing for being organ donors. Of the ones who had accepted to donate their organs 64.5% refused to donate their bodies. Conclusion: The results of the study indicate that not only whole body donation, but also organ donation still keep on being a problem in Turkey.

SEX DIFFERENCES IN FINGERPRINT RIDGE DENSITY IN A TURKISH YOUNG ADULT POPULATION: A SAMPLE OF BASKENT UNIVERSITY

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Aim: Fingerprints are considered to be one of the most reliable methods of identification. Epidermal ridges are polygenic characteristics that form intrauterine 10–18 weeks and considered fully developed by the sixth month of fetal growth. Dermatogliphics, available in the crime scene play an important role in binding a suspicious to the crime since they are identical for each individual. The aim of the present study is to determine fingerprint ridge density in Anatolian population and to evaluate the effects of dermatogliphics in estimating sex. Methods: Fingerprints were obtained from 109 female and 71 male a total of 180 students aged between 18 and 25 years by means of simple inking method. Fingerprints were taken from the distal phalanges of both hands and the ridges were counted diagonally in three different areas of each digit. The fingerprint ridge density in 5 mm squared

radial, ulnar and inferior areas were noted and evaluated related with sex. Results: The females have a significantly higher ridge density than males in all the three areas. The fingerprint ridge density in the ulnar and radial areas of the fingerprints is significantly higher than the lower area. Conclusion: Fingerprint ridge density can accurately be used by medico-legal examination for sex identification.

NOISE-ASSOCIATED WHOLE-BODY VIBRATION CAUSES SYSTEMIC ANATOMICAL ALTERATIONS IN THE CONNECTIVE TISSUE OF WORKERS AND OF RATS TO THE SAME TYPE OF ENVIRONMENTAL STIMULUS

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Large textile plants of northern Portugal, as well as aeronautical outfits, have their workers chronically exposed to high intensity noise of low frequency that causes wholebody vibration during working hours. We have studied these groups of workers and found an higher incidence than in controls of fibrotic alterations of the lungs and pericardial leaflets of the heart. Noise of the same textile plants was recorded and reproduced in a noise-isolated room of an animal house where rats were kept and exposed 8 hours per day to the same type of industrial noise that occurs in textile plants. We have studied by light and electron microscopy the pathological changes induced by exposure of rats to this noise-induced vibration in several organs of the animals after different periods of treatment with this environmental aggression. We found massive loss of cilia in the trachea of the animals and increase in the connective content of the ling and pleura. The centrolobular area of the liver was also enlarged by deposition of collagen fibers and there was enhancement in the width of the pericardium. The adrenal cortex was also profoundly altered with regards to the distribution of lipid droplets as well as the relative width of its different histological domains. These experimental findings indicate that whole-body vibration may trigger increase in the production of connective tissue fibers by fibroblasts from different organs of the rat thus pointing for a systemic action of whole-body vibration in the dynamics of the connective tissue, both in rats and men. (This investigation was supported by funding of FCT/Portugal to UMIB)

MODIFIED TENSION BAND WIRE FIXATION TECHNIQUE FOR OLECRANON FRACTURES: WHERE AND HOW SHOULD THE K-WIRES BE INSERTED TI AVOID ARTICULAR PENETRATION?

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Aim: The aim of the study was to evaluate the possibility of articular penetration of K-wires inserted at different levels and different angles on the olecranon. Methods: Morphometric parameters of 50 cadaveric ulnas; including olecranon height and heights of the central, radial and ulnar facets of the semilunar notch were measured. Instrumentations were performed on exact foam replications. In the sagittal plane, articular angle and so-called “tubercle angles” were measured. Two 1.6 mm parallel K-wires were inserted from 0, 5 and 8mm anterior to the dorsal cortex of the olecranon process at angles of 20° and 30°. Articular penetration by the wires was evaluated both visually and radiographically. Results: The mean central, radial and ulnar heights of the semilunar notch were17.3mm (14.7-20.0), 16.2mm (12.0-21.0) and 15.8mm (13.30-20.5), respectively. No articular penetration was observed at the 0mm level at 20° and 30° angles (0mm20°30°) or at 5mm20°. There was poor concordance between the radiological and direct observational assessments, especially for 8mm20°and 5mm30°. The frequency of intraarticular positioning for those observed to be radiologically extraarticular was 4/28(14.3%) for 8mm30°, 4/7(57.1%) for 8mm20° and 5/6 (83.3%) for 5mm30°. Conclusion: When applying this technique to prevent any articular penetration, K-wires should be inserted in the first 5mm from dorsal cortex of the olecranon process at maximum 20^{o}. Moreover, if the wires need to be inserted more anteriorly because of the fracture type, they should be inserted at a shallower angle in the sagittal plane in relation to the proximal cortex of the ulna.

ANATOMICAL CHARACTERISTICS OF THE ANTERIOR CEREBRAL ARTERY

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Introduction: Cerebral circulation, especially arterial, last decades provokes interests of anatomists and clinicians. The aim of this study was to analyze the anatomical characteristics of the anterior cerebral artery such as: shape, localization, diameter and length. Materials and methods: The investigations of morphological and topographic characteristics of the anterior cerebral artery are made on 133 human brains without cerebrovascular pathology, from both sexes at age from 23 to 68. Part of the specimens is fresh, and other is fixed.Results: The proximal part of the anterior cerebral artery extends from the point of bifurcation of the internal carotid artery to the connection with anterior communicant artery and on all of its length lies in the cistern of the terminal lamina, dorsal from chiasm (74%) or dorsal from the optic nerve (26%). The shape of the proximal part in 58.5% looks like letter S, in 30.5% has arcuate shape and in 11% is horizontally situated. The length of the proximal part is from 6.8 to 21.8 mm, and the is from 0.6 to 3.1 mm Conclusion: Knowledge of anatomical characteristics of the anterior cerebral artery is useful teaching material for the anatomists, for the clinicians is important for performing diagnostic and intervention procedures surgical or endovascular.

OBSERVATIONS REGARDING SOME IMPROPER TERMS OF THE CLINICAL ANATOMICAL TERMINOLOGY

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As it is widely known, most surgeons utilize in daily practice not the official anatomical terms of Nomina Anatomica, but the clinical anatomical terms that are accompanied by the physician’s name who first described the specific anatomical element, the anatomical eponyms. However, History of Medicine has sometimes attributed the discovery or first description of some anatomical structures to the wrong physician. In that work, we display some characteristic “inappropriate” clinical anatomical terms, as follows: 1) Eustachian tube. Although the pharyngotympanic tube has been described by Eustachio in 1562, the first report of its existence was made by Alkmeon from Krotona (5th century BC) who stated that “goats breath through their ears”, later from Aristotles who claimed that “there is a communication

between ear and oral cavity" and from Hippocrates who said that "pus from ear can be absorbed by a sponge placed in the nasal cavity". 2) Antrum of Highmore. The first who described the maxillary sinus was not Highmore in 1651, but Leonardo da Vinci (1487-1499), who described a figure with an opened cavity inferior to the orbit that "contained liquids for the nutrition of teeth's roots and support of the cheek". However, that design was kept in the Royal Library of Windsor until 1901, when the scientists were able to study it. 3) Circle of Willis. This arterial circle that was described by Thomas Willis is 1964 was previously described by J. Vesling in 1647. 4) Ileocecal Valve. That valve that is known as "valve of Bauhin" (1605) was previously described by A. Laguna (1535) and Fallopius (1553). 5) Uterine tubes. Before Fallopius (1561), Galenus (138-201 AD) was the first who discovered and described them.

SECTIONED IMAGES AND 3D SURFACE MODELS OF THE OCULOMOTOR, TROCHLEAR, AND ABDUCENS NERVES

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Aim: The aim of this research was to present sectioned images and surface models that allow the whole courses of III, IV, and VI and circumjacent structures to be observed in detail. Methods: To achieve this, the structures of whole courses of III, IV, and VI were traced on sectioned images, and surface models of the structures were reconstructed on Mimics and Maya software. Results and conclusion: As a result, nucleus of III, Edinger-Westphal nucleus, nucleus of IV, and nucleus of VI and their fibers were identified on brainstem in sectioned images. In sectioned images, the nerves passed both sides of the cavernous sinus and entered at the orbit through the superior orbital fissure. In sectioned images, the nerves innervated extraocular muscles in orbit. In surface models, the whole courses of the nerves and circumjacent structures could be explored freely three-dimensionally. The greatest advantage of the sectioned images was that they allowed the whole courses of III, IV, and VI and circumjacent structures to be observed as real colored in an unbroken line. In addition, the surface models allowed the stereoscopic shapes of nerves to be comprehended. The sectioned images and surface models could be applied for medical education purposes or training tools, thereby making neuroanatomy of the nerves easier to learn. All data generated during this study is available free of charge at anatomy.dongguk.ac.kr.

IMPACT OF NUTRITION AND PHYSICAL ACTIVITY ON THE VARIABILITY OF OBESITY IN CHILDREN OF THE MOUNTAIN –LITTORAL COUNTY

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Background and Aim: Unhealthy diet and physical inactivity are risk factors for obesity in children, with consequences in adulthood, which involve development of many chronic non-infectious diseases. The aim of this study was to determine whether diet, physical activity and age are predictors for obesity in children of the Mountain – Littoral County. Subjects and Methods: Subjects were pupils of the first and sixth grade of the elementary schools, and also students of second year of high schools, a total of 167, of which 92 boys and 75 girls. All study subjects were measured for body height and body weight. Nutritional status was assessed by the curves of the central distribution of body height and body weight for given age. Body mass index (BMI) was determined for second grade pupils of secondary schools. Students have completed a questionnaire about diet, and obtained data were about frequency of consumption of certain types of foods, and also about their physical activity. To determine the extent to which age, diet and physical activity predict the obesity, Pearson correlation coefficient and hierarchical regression analysis was employed in statistical analysis. Results: The results showed that age was a significant predictor of obesity (β=0.16, t=-2.04, $p<0.05$) and prevalence of obesity decreased with age. Consumption of vegetables was significantly associated with low birth weight, regardless of gender ($r = -0.25$, $p < 0.05$), while other types of food were not significantly associated with obesity. Out of all, 34 % of respondents were actively engaged in some physical activity, mainly recreational. Physical activity was not significantly associated with obesity. Conclusion: These results indicate that a need for public health prevention programs, with a multidisciplinary approach, in order to prevent or to slow down the complications that may arise in adulthood as a conseq-uence of obesity in childhood.

PRIMARY OPEN-ANGLE GLAUCOMA: RISK FACTORS, MORPHOLOGICAL AND FUNCTIONAL CHANGES

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The aim of our study: to examine risk factors for glaucoma in people of Lviv region and to explore the morphological and functional changes in the eye with this disease. Material and methods: based on Lviv ophtalmological department's data, there were 97 patients with primary open-angle glaucoma and their medical history analyzed. 49 of them are men (50.5%) and 48 - women (49.5%). All of the examined are currently living in Lviv region. As a part of medical examination, where conducted the following tests and methods: the collection of medical history, visual field testing, tonometry, gonioscopy, biomicroscopy, ophtalmobiomicroscopy, pachymetry, static and kinetic perimetry, optical coherence tomography of the eye nerve (OCT). Results: the average age of the examined - 62 years. In 75 of them (77.3%) glaucoma was caused by a genetic factor (predisposition due to close relatives with this kind of eye disease); 44 patients (45.3%) on cardiovascular disease background are suffering from primary open-angle glaucoma. Among the patients first stage of glaucoma was found in 26 of them (26.8%), the second - in 45 (46.3%), and the third - in 20 (20.6%), fourth (terminal) stage - 6 (6.1%). Conclusions: 1) risk factors for primary open-angle glaucoma include age, genetic predisposition and the presence of cardiovascular diseases. 2) Depending on the stage of development of the glaucomatous process, was observed functional impairment (change in visual acuity) and morphological changes in the form of atrophy of the optic nerve.

LIMP PRINT CHARACTERSITICS IN ANATOLIAN POPULATION AND ITS EFFECTS ON SEX DISCRIMINATION

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Aim: Human identification plays a vital role in any crime investigation. Among the various other established methods cheiloscopy is also important in linking the criminal with the crime since lip print pattern it is characteristic to the individuals as fingerprints or palatal ruga. It is completed at the sixth month of intrauterine life and does not change later. The main aim of the present study is to determine the limp print pattern for Anatolian population and to evaluate it related

with sex. Methods: Lip prints were taken from 143 male and 291 female, a total of 434 university students. The lip prints were first separated in to six quadrants and the prints in each quadrant were determined according to Tsuchihashi's classification. Binary Logistic Regression Analysis was used for the estimation of sex. Results: On the upper right quadrant forked grooves, on the upper middle quadrant reticular grooves, on the upper left quadrant forked grooves were the most commonly observed patterns in both sexes. When the patterns on the lower lip were evaluated on the lower right quadrant forked grooves, on the lower middle quadrant vertical clear cut grooved crossing the whole lip and on the lower left quadrant forked grooves were the most commonly observed pattern types both in male and female individuals. Conclusion: Statistical analyses indicate that sex could accurately be estimated in 70.3% of the subjects.

SEX ESTIMATION FROM HAND DIMENSIONS IN ANATOLIAN POPULATION

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Aim: Sex estimation is one of the most important parameters for personal identification from mutilated and amputated limbs in medico-legal investigations. Since populations differ in body size and proportions anthropometric assessments related with sex estimation also change. Hand dimensions have been used for sex estimation by several authors on various populations. However such studies on Anatolian population are limited. The main aim of the present study is to evaluate the accuracy of hand dimensions on the estimation of sex. Methods: 13 anthropometric measurements were taken from the both hands of 233 male and 254 female, a total of 487 subjects with a mean age of 20.28 ± 2.499. Binary Logistic Regression Analyses were used for the estimation of sex. Right and left hands were evaluated separately. Results: All the measurement were significantly higher in male subjects ($p<0.001$). For right hand and length, hand breadth, palm length, lengths of the five fingers and proximal inter-phalangeal joint breadths of each finger except the fifth one were inserted to the regression equation. For the left hand all the measurements taken from the hand were inserted to the regression equation. Conclusion: By using Binary Logistic Regression Analyses sex could accurately be estimated in 94.3% of the individuals depending on left hand dimensions, and in 94.5% of them depending on the measurements from right hand.

MATERNAL HIGH-FAT DIET DURING PREGNANCY AND LACTATION AND EFFECTS ON MALE OFFSPRING WEIGHT AND ORGAN DEVELOPMENT

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Aim: Obesity, as global epidemic, induces many different disorders, just to mention metabolic syndrome. Several studies have tried to explain the correlation between maternal nutrition and consequences in metabolic profile of offspring, having in mind hypothesis of a "thrifty phenotype" as an adaptive mechanism preparing the organism to its likely adult environment. In this study, we investigated the effects of maternal high-fat diet prior and during pregnancy and lactatiton on weight, organ development and laboratory findings in male offspring. Methods: Ten female Sprague Dawley rats, 9 weeks old, were randomly divided in two groups. One group was fed with high-fat diet (HFD group), the other with standard laboratory chow (CD group). After pregnancy and lactation male offspring were also randomly divided in two groups each- HFD and CD. At 12 weeks of age the offspring were sacrificed and blood and tissue samples collected. From blood samples total cholesterole, trygliceride and glucose level, IL-6 and TNF-alpha were measured. Organs weight: heart, liver, testis, kidney, spleen, thymus and lungs were measured. Results: We observed an increase in body and organ weight in all organs except thymus in offspring fed high-fat diet compared to CD-CD group. No significant difference in organ weight between CD-HFD and HFD-HFD group was observed. There was no significant difference in tryglicerides, glucose, IL-6 and TNF-alpha levels between the groups where dams and/or offspring were fed with high-fat diet. Total cholesterole level in serum was increased in aforementioned groups. Conclusion: Our results show that high-fat diet affects organ development.

MORPHOLOGICAL EXAMINATION OF THE THYROID GLAND IN APOLIPOPROTEINE DEFICIENT MALE MICE AFTER ADMINISTRATION OF LEVOTHYROXINE

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Aim: The aim of our study was to determine the eventual histological reactive changes of the thyroid gland after levothyroxine treatment in apolipoprotein E deficient male mice. Methods: The experiment involved 12 male apolipo-protein E deficient mice with C57BL/6 genetic base (ApoE $KO^{-/-}$) divided into control and experimental group. The experimental group of mice received levothyroxine dissolved in drinking water in daily dose of was 10 µg/100 g BW. The experiment lasted 12 weeks. Paraffin sections of the thyroid gland were stained with routine hematoxillin-eosin staining method. Results: Qualitative histological analysis of the thyroid gland in treated mice demonstrated presence of follicles in various sizes with dominance of large distended follicles in the peripheral parts of the gland. In the central areas of the gland, in contrary, follicles were small. The lumen of the follicles was fulfilled with large amount of homogenous, eosinophillic colloid, with complete absence of resorptive vacuoles in it. The epithelium in the follicles was flattened and squamous in both, central and peripheral areas of the gland. The cell nuclei were also flattened hyperchromatic. Conclusion: The results in this study showed that levo-thyroxine causes characteristic morphological changes in the structural components of the thyroid gland, in direction of occurrence of hyperthyroidism in apolipoprotein E deficient male mice.

COMPARISON OF CD1A POSITIVE LANGERHANS CELLS IN NORMAL HUMAN EXOCERVICS AND VAGINA

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Introduction: Langerhans cells (LCs) are the predominant antigen presenting cells present in the epithelial tissue. They can be classified into five types based on the characteristics of the dendritic processes. This study aims to demonstrate the morphology and distribution of CD1a positive LCs in the normal human exocervix and vagina using immune-histochemistry. Material and method: Normal cervical tissues obtained from nine patients who underwent abdominal

hysterectomies for various ailments and six vaginal specimens from patients who underwent vaginal hysterectomy for prolapsed were processed for immunohistochemistry. Four microns thick serial sections were taken and stained with monoclonal mouse antihuman CD1a antibody and viewed under a light microscope. The diameters of the cells were measured using the Cellsens image analyzing software and statistically analyzed. Results: The vagina had more number of CD1a positive LCs than cervix per unit length of epithelium (p=0.01). In both cervix and vagina, type I cells were predominant. Cells with more number of processes i.e., Type IV and type V cells were more in vagina than in cervix. The mean diameter of CD1a positive LCs in vagina was significantly less than that of cervix. Conclusion: The presence of more number of type IV and type V LCs in vagina indicates that the LCs in vagina have more surface receptors and thereby display a high antigen-binding activity. In addition, the increased number of LCs in vagina when compared with cervix indicates that vagina is more equipped for protection against various pathological microorganisms as it is externally placed.

APPEARANCE OF INTERSTITIAL CELLS OF CAJAL IN THE HUMAN DIGESTIVE TRACT

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Although the exact role of Interstitial Cells of Cajal (ICC) is still controversial, it is well known that these specialized network-forming cells are involved in the control of digestive motility. ICC depend on stem cell factor (SCF) signaling via Kit for development and maintenance. Recent studies have shown that ICC are not derived from the neural crest, but rather are mesodermal in origin. However, some findings suggest that the cells present in the inception myenteric plexus (MP) and submucous plexus (SMP) ganglia are “responsible” for ICC differentiation, representing probably the source of SCF. At the end of the embryonic period of human development, c-kit immunoreactive (c-kit IR) cells form an uninterrupted wide belt, extending throughout the esophagus, stomach (except for the fundus), to the proximal part of duodenum, around the inception of the MP ganglia. C-kit IR cells appear in the distal duodenum and other parts of the gut originating from the midgut, in the beginning of the fetal period of development, in the form of narrow linear rows of cells, situated at the level of the MP. In the colon they appear simultaneously around the inception of the SMP and MP ganglia, in the form of a two belts of cells. Simultaneous appearance of ICC at the SMP and MP level in the colon can be explained by the fact that there are differences in the migration of neural crest cells in particular portions of the digestive tube. In conclusion, in the humans, there was a difference in the patterns of appearance of ICC in the colon compared to the rest of the gut.

THE ROLE OF FAT DISTRIBUTION AND ADIPOCYTOKINES IN DISORDERS LINKED TO OBESITY

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Aim. Adipose tissue is the largest endocrine organ, mostly located under the skin, as subcutaneous adipose tissue (SAT), and around visceral organs, as visceral adipose tissue (VAT), the latter being highly correlated with metabolic syndrome. For example some adipocytokines secreted by adipose tissue and accumulation of epicardial adipose tissue (EAT) has been linked with CAD. The aim of this presentation is to evaluate the role of fat distribution as well as the endocrine function of adipose tissue in development of several disorders linked with obesity. Methods. Research provided at Department of Anatomy and Neuroscience associated with this subject we can divide in two models: animal and human model. In animal model we wanted to determinate impact of mothers` nutrition and nutrition of offspring observed on several parameters. In human model we analyzed role of fat distribution and cytokine expression in adipose tissue collected from Department of Surgery. Results. Current results in human model showed that fat distribution as well as change of cytokine expression in adipose tissue have more important role in development of metabolic disorders than volume of adipose tissue itself. Experiment with two generations of rats exposed to high fat diet indicated that maternal type of diet has significant importance on disorders developing in offspring.Cocnlusion. Inflammation of adipose tissue, measurable with expression of cytokines, is one of key etiopathogenetic factors in various diseases.

ANATOMICAL DISSECTION - FACT OR FICTION

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Anatomy as a foundation of medicine study has been for ages taught by dissecting human bodies, starting before ancient Egypt. In the Middle Ages dissection was forbidden in Europe for years by Catholic Church. Later on, the bodies used for dissection belonged to executed criminals or poor people without relatives. Nowadays, in European countries the system of body donation is not unique. It is difficult to say why Spain, France, Germany, Austria, Slovenia and some other countries have no problem with donors. On the other side, in countries like Italy, Great Britain, Croatia and Serbia study of anatomy is jeopardized because of lack of donors. One cannot speculate why somewhere people donate their bodies easily and why somewhere do not, for there are many cultural, religious and other similarities between both groups of countries. In Slovenia, the legislation that regulates body donation is very lax. People who donate their body only have to fill in and sign a form. The original form is kept by the donor and its copy by the Institute. The Institute covers the transportation costs of the body, with no refund to the donor. At the moment, the Institute of Anatomy keeps over 5.000 wills of donors, which represents more than 2 ‰ of the Slovenian population. In 2013 we accepted 378 wills and 43 bodies, and in 2014, till the end of March, we got 147 wills and 23 bodies. Thus, we can easily organize anatomical curriculum through dissection courses. Besides, we can organize surgical courses and experiments on fresh human cadaveric material every year.

EXTENSIVE BILATERAL RENAL VARIATION

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Aim: identification of 13 variant anatomical structures in the renal system of a cadaver. Method: During a routine dissection of a 71 year old male cadaver, the anatomical structures and organs of the posterior abdomen were exposed; the renal system was fully dissected and photographed (see Fig. 1).The inferior vena cava was reflected inferiorly (see Fig 2), to display the vessels behind. The following variations were observed. Results: 1. Elevated Rt.Kidney, 2. RSRA & V - right superior renal artery and vein, 3. RRRA & V – right retropelvic renal artery and vein, 4. RAbIRA & V – right aberrant (inferior) renal artery and vein, 5.

RTA & V – right testicular artery and vein, 6. LRRA – left retropelvic renal artery, 7. LSAA – left superior apical artery, 8. LSRA & V - left superior renal artery and vein, 9. LMRA – left middle renal arterym 10. LAbIRA & V - left aberrant (inferior) renal artery and vein, 11. LRV - left renal vein, 12. LTA & V – left testicular artery and vein, 13. DU – dilated ureter. Conclusion: Despite the wide range of renal variations reported in anatomical and clinical journals, the variations presented here appear to be among the most extensive the authors have observed. These variations involve the majority of the components of the renal system listed in above results. With the advent of endoscopic surgery, the renal specialist must appreciate the possibility of the existence of such variations. The accompanying figures clearly illustrate the extent of these variations; therefore, this case report helps provide an awareness and additional insight for surgeons and radiologists preparing to diagnose and treat the abnormalities of the renal system.

ANATOMIC LANDMARKS IN ENDOSCOPIC THIRD VENTRICULOSTOMY

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The aim of this review is to recapitulate anatomic landmarks with special attention to the cases with deformed ventricles caused by chronic hydrocephalus. In the modern era, neuroendoscopy has had an increasingly prominent role in neurosurgery. As attention has focused the development of minimally invasive surgical methods, neuroendoscopy has advanced both as an independent treatment modality for various neurologic disorders and as an adjunct to microneurosurgery. Neuroendoscopy is distinct from traditional surgery, and a thorough understanding of its unique attributes is required to attain maximal benefit. In addition to its advantages, neuroendoscopy is associated with unique obstacles that must be anticipated, appreciated, and accounted for to prevent complications. Use of neuro-navigation which is of immense help in most of neurosurgical cases is of limited use in neuroendoscopy. Knowledge of anatomical landmarks is obligatory to successfully perform endoscopic third ventriculostomy (ETV), a golden standard in treatment for obstructive hydrocephalus. For ETV, the landmarks are choroid plexus in choroid fissure, septal and talamostriate veins to identify Foramen of Monroe. Once when foramen is traversed, navigation through third ventricle is based on paired mammillary bodies from which the surgeon can discern the midline and anterior retrochiasmatic space. In the space between retrochiasmatic recess and mammillary bodies is the flat and often thinned floor of the third ventricle. Ventriculocisternostomy is performed by blunt perforation and dilatation with Fogarty 3Fr catheter.

CRITICAL FAT MASS AS A PREDICTOR OF VITAMIN D DEFICIENCY

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Aim: Vitamin D deficiency may play a role in the development of a number of cardiometabolic disturbances (cardiovascular disease, type 2 diabetes mellitus and metabolic syndrome). There are reports of an association between obesity and vitamin D deficiency. In this context, the aim of this study was to determine the vitamin D levels in obese and nonobese individuals and to assess the relationships between vitamin D and anthropometric indicators of obesity. Material and Methods: We examined 50 obese patients (body mass index, BMI: 43.5 ± 9.2 kg/m²) and 36 normal weight subjects (BMI: 22.6 ± 1.9 kg/m²). Anthropometric measurement were performed in order to assess nutritional status, weight and fat tissue distribution. Serum concentrations of 25-hydroxy-vitamin D, 25(OH)D, as <50 nmol/L was defined as deficiency. Critical values were calculated using linear equations by method of last squares. Results: The prevalence of vitamin D deficiency was 88% among obese and 31% among nonobese individuals. 25(OH)D level was significantly lower in obese group (27.3 ± 13.7 vs. 64.6 ± 21.3 nmol/L; $p<0.001$). There was a negative correlation between vitamin D level and anthropometric indicators of obesity: BMI ($r = -0.64$; $p<0.001$), waist circumference, WC ($r=-0.59$; $p<0.001$) and body fat percentage, BF% ($r=-0.64$; $p<0.001$). Trend estimation shows that for all observed anthropometric indicatiors, 25(OH)D shows decreasing dependence. Critical value of vitamin D level for BMI was 49.1 nmol/L and for BF% 48.4 nmol/L. Conclusion. Increase in body fat mass leads to a deterioration of Vitamin D deficiency.

EFFECT OF SALBUTAMOL ON INNERVATED AND DENERVATED RAT SKELETAL MUSCLES

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The aim of this study was to establish a 14-day time course study on innervated and denervated rat soleus and tibialis anterior muscles after treatment with salbutamol, a β_2 adrenoceptor agonist to assess fiber type selectivity in their type composition. Soleus, as a slow-twitch muscle, is composed of 90% type I fibers and 10% type II fibers. On the other hand, tibialis anterior muscle is fast-twitch with 91,6% type II fibers and 8,4% type I fibers. We observed that during the period of denervation occurs the conversion from type I to type II muscle fibers. However, in soleus muscle of the animals which were treated with salbutamol this conversion was less expressed and an increased number of type I fibres were observed. In tibialis anterior muscle, fibres conversion was higher what caused the significant increase in number of type II fibres. Groups of healthy muscles that were treated with salbutamol, showed an increase in number in both muscles of fibres type II until 9th day of experiment. While in soleus the number of fibres type II was increasing towards the end of experiment, in tibialis anterior muscle showed a conversion in second part of experiment from type II fibers to type I. In this study, we have shown how muscles of different properties reacted differently to various stimuli.

METAPLASTIC CHANGES OF GASTRIC MUCOSA IN PATIENTS WITH CHRONIC GASTRIC EROSIONS CONBINED WITH BILIARY TRACT DISEASE

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Aims: to assess metaplastic changes in patients with chronic gastric erosions (CGE) combined with biliary tract disease (BTD). Methods: Adult patients (18-65 years) with endoscopically confirmed CGE and presence of BTD were eligible to participate (I group). As controls, patients with CGE and duodenal ulcer (II group) and CGE and chronic gastritis (III group) were recruited. Biopsy specimens were taken from stomach due to the Houston-updated gastric biopsy sampling protocol. One expert gastrointestinal pathologist, blinded to all

patient clinical information, assessed tissue samples. Metaplasia was scored due to Operative Link on Gastric Intestinal Metaplasia (OLGIM) staging system. Results: 294 patients (I group – 151, II group – 73, III group – 70) were included into the study with no statistical difference in age and sex between groups. Antral metaplasia (I-III stage) was detected in 115 (76.2%) patients of the I group, 22 (30.1%) - of the II, and in 32 (45.7%) - of the III one. Corpus metaplasia (I-II stage) was seen in 21 (13.9%) patients of the I group, 1 (1.4%) – of the II, and 2 (2.9%)– of the III group. Complete (intestinal) metaplasia dominated among the patients of all three groups. Incomplete (colonic) metaplasia was more frequently detected in antrum than in corpus. Conclusion: Significant difference between groups in presence of antral metaplasia (P1-2 <0.0001, P1-3 <0.0001) as well as corpus metaplasia (P1-2 = 0.003, P1-3 =0.01) was found. Possibly bile acids or lysolecithin in combination with HCl accelerate the development of intestinal metaplasia in chronic gastritis.

PECULIARITIES OF VENOUS DRAINAGE FROM HUMAN CARDIAC CONDUCTION SYSTEM

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The aim of the work is to study the ways of venous drainage from the atrioventricular node, AV bundle and its branches. The material includes 129 heart specimens of fetuses, infants, children and adults of both sexes and different ages. The cardiac veins were injected with contrast and staining enhancements followed by radiography, dissection, different-iation, and preparation of serial histological sections. The venous drainage from the AV node and the AV bundle proceeds through the smallest cardiac veins directly into the right atrial cavity and into the coronary sinus through the middle cardiac vein, from anatomical bifurcation of the AV bundle and its branches through the great and the middle cardiac veins into the coronary sinus. We noticed that the number of smallest cardiac veins draining the AV node and the AV bundle varies. We revealed a strong connection between the direction of the venous drainage from the AV bundle branches and development of the middle and the great cardiac veins. We found out that the drainage from the node and bundle into the smallest cardiac veins prevails in case the latter are more developed, the drainage into the vein accompanying the artery of the AV node prevails in case the coronary sinus inflow prevails and Thebesius vessels are less developed, and the drainage into the system of both occurs if they are equally developed.

STRUCTURAL ORGANIZATION OF HUMAN CARDIAC CONDUCTION SYSTEM WITH REGARD TO CARDIAC STRUCTURE

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Development of surgical treatment methods of arrhythmia and congenital heart defect is determined to a large extent by the correct assessment of the cardiac conduction system (CCS) structural variability. The aim of this work is to study individual differences in position, size and shape of parts of the CCS atrioventricular portion in terms of age and with regard to the cardiac structure. By applying generally accepted morphol-ogical methods to 501 heart specimens of 12- to 32-week gestation fetuses, infants, children and adults of both sexes and different ages, we studied the position, size and configuration of the atrioventricular node (AV node), AV bundle and its branches with regard to the structure of cardiac ventricles and portions of the interventricular septum (sinus, trabecular, conical). The following cardiac shapes can be distinguished: long and narrow heart (with index less than 0.8), short and wide heart (with index exceeding 0.95) and heart of intermediate shape (with index equal to 0.8-0.95). The fetuses during postnatal life have the identical structural variations of the cardiac ventricle with certain quantitative correlations of linear dimensions of inflow and drainage portions and properties of the interventricular septum (IVS) portions. The structural organization of the cardiac ventricles implements the principle of conformal symmetry as the most common pattern of morphogenesis. Every structural variation of the cardiac ventricle corresponds to a set of certain properties of the AV node, the AV bundle and its branches, reflecting the changed angles of their position, linear dimensions and shape. The IVS sinus portion and the AV bundle form a correlative pair. The variability of linear dimensions and shape of the IVS sinus portion determines the different length and the angle of the AV bundle position. The variations of anatomical correspondence of the CCS and the heart are formed during antenatal life.

REG GENES EXPRESSION IN REGENERATING SKELETAL MUSCLE

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The Reg genes have been well documented to play an important role in various tissue regeneration processes, cell proliferation, differentiation and carcinogenesis. However, the regulation of Reg gene expression in rat skeletal muscles regeneration process is poorly understood. Therefore, the aim of this investigation was to reveal the transcriptional activation of Reg genes in the skeletal muscles in response to injury. In 2-month-old Wistar rats three experimental models of muscle and nerve injury were used. The regeneration process was induced in both type of muscles, slow (m.soleus, SOL) and fast (m. extensor digitorum longus, EDL) by injection of 1 ml of local anesthetic, by denervation while in third experimental model muscle denervation and injection of local anesthetic were combined. The RT-PCR analysis was performed for detection of Reg1, Reg3G and Reg4 mRNA in regenerating muscles. RT-PCR analysis showed that Reg1 gene is expressed in EDL and SOL with peak expression 12 hours after injury and signal intensity was constant till 7th day in all three experimental models. Reg 3G can be detected over a longer period in comparison with Reg1 and signal intensity was lower. There was no detectable Reg4 mRNA expression in either SOL or EDL muscle. Our investigation revealed presence of Reg1 and Reg3G genes in regenerating skeletal muscle and its expression is up regulated with regeneration process. Reg1 and Reg3G genes expression was induced in both skeletal muscles at a considerably early time point after muscle injury. Our results imply that Reg genes have a significant role at the early stage of skeletal muscle regeneration.

IMPORTANCE OF LIP ANATOMY IN ENHENCEMENT WITH FILLERS

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Lips are the window to the character and age of a person. Integrated activity of lips, cheeks, oral fissure and temporo-mandibular joint enables numerous movements including biting, chewing, drinking, sucking, swallowing but additionally innumerable subtle variations of moving activities are possible leading to permutations of facial expression. Through this fine activity of lips one's moods are expressed. Why so numerous movements of the lips are possible? From esthetic point of view five elements and proportional relationships of lips need to be followed to make lips beautiful and natural looking: a beautifully shaped Cupid's bow, properly proportioned pair of philtrum columns just above, a careful »smooth-S-form«

vermillion, support of oral commissure and an appropriately proportioned lower lip. Detailed insight into functional anatomy and considering basics of lip esthetics are crucial for enhencement of lips with fillers.

CONTEMPORARY APPROACH TO RADIOLOGICAL DIAGNOSIS OF ADRENAL TUMORS

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Tumours in the adrenals are common in humans, being present like incidentalomas in 2-9% of all computed tomography (CT) imaging of the abdomen. In patients with malignant disease, 32-73% of accidentally discovered masses in adrenal glands are metastatic. Radiology is playing a critical role not only in detection of adrenal abnormalities but in distinguishing benign from malignant adrenal tumors. The aim of this study is to describe the current concepts of differentiating a benign from a malignant adrenal mass with particular attention to computed tomography and magnetic resonance (MR) imaging. This is a pictorial review of cases, met in our department. We describe MDCT finding in 29 patients with adrenal mass and MR finding in 11 patients, after we performed MDCT. Most of tumors, 15 were adenomas, 6 were adrenal metastases, 2 myelolipomas, 4 phaeochromocytomas and 2 adreno-cortical carcinomas. CT is the cornerstone of imaging of adrenal tumors. The value of unenhanced and enhanced CT densitometry with emphasis on the washout features to distinguish between lipid-rich and lipid-poor adenomas and malignant lesions is detailed. When the lesions cannot be characterized adequately with CT, MRI evaluation with T1- and T2-weighted sequences and chemical shift and fat-suppression refinements is necessary.

RELATIONSHIPS BETWEEN SPHENOID SINUS AND ADJACENT NEUROVASCULAR STRUCTURES: A NEW CLASSIFICATION

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AIM: Sphenoid sinus is closely related to the adjacent neurovascular structures. According to the literature, a big difference in the incidence of protrusions of these structures was described. Moreover, each author used his/her own classification, so the measured data were incomparable. Therefore, unique classification of aforementioned protrusions is indispensable. In this study we explored the incidence and relation between sphenoid sinus and neurovascular structures. New classification of these relationships was proposed. METHODS: The study was performed on 51 skulls (=102 sinuses) using Cone Beam Computed Tomography. We investigated interrelation between maxillary nerve, pterygoid nerve, optic nerve, internal carotid artery, mandibular nerve and sphenoid sinus. They were classified into five categories based on protrusion of each structure: 0 (without close relationship), T (touches, but no protrusion), P1 (protrusion < 25%), P2 (protrusion between 25% and 50%) and P3 (protrusion > 50%). RESULTS: Incidence of position and relationship regarding to sphenoid sinus for each of five structures was: A) maxillary nerve: 0=58.8%, T=21.6%, P1=13.7%, P2=2.9% and P3=2.9%; B) pterygoid nerve: 0=45.1%, T=19.6%, P1=15.7%, P2=2% and P3=17.7%; C) optic nerve: 0=43.8%, T=29.5%, P1=12.4%, P2=10.5% and P3=3.8 %; D) internal carotid artery: 0=56.9%, T=7.3%, P1=18.3%, P2=7.3% and P3=10.1%; E) mandibular nerve: 0=95.1% and T=4.9%. CONCLUSIONS: Relationships between sphenoid sinus and surrounding neurovascular structures were highly variable (except mandibular nerve). Employing the new classification, level of protrusions was described in details. Knowledge of these anatomic variations is essential for improvement of surgical procedures and for the better understanding of the pathological processes that can occur in the sphenoid sinus.

THE INFLUENCE OF TORSION OF THE SPINE ON TECHNIQUES OF FACET JOINT BLOCKS WITHOUT HELP OF VISUALIZATION

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Introduction: The facet joint block techniques without optical guidance have not investigated with respect to the precision of the needle's positioning in patients with scoliosis. Materials and Methods: X-rays from 49 patients with different levels of scoliosis were analyzed retrospectively by measuring the Cobb angle forming three groups with rising Cobb angle. The position of the lumbar spines was determined based on CT-Data aiming for a three dimensional model of the lumbar spines. The spatial position and the rotations around anatomical axis of specific vertebras were calculated. Afterwards two facet joint block methods without optical guidance were simulated and the point of injection on the skin was identified using vector analysis. The radial distances between a predefined ideal injection point and the injection points obtained by two facet joint techniques without optic guidance were measured and correlated with the groups of different Cobb angles. Results: The two methods without optical guidance showed no gender-related differences with respect to accuracy. The mean radial distances between the ideal injection points and the injection points for both methods increased with rising Cobb angles. A maximum radial distance of 31.1 mm from the ideal injection point was observed. Conclusion: For Cobb angles greater than 10 degrees the radial distances between the ideal injection point and the injection points suggested by the described methods were larger than 20 mm. This inaccuracy might result in incorrect positioning of the needlepoint with consecutive risk higher of complications.

THE SINESTROL TREATMENT OF PREGNANT MICE AFFECTS BODY GROWTH OF THEIR OFFSPRING IN EARLY POSTNATAL DEVELOPMENT

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The estrogenic support for prevention of miscarriage and incomplete pregnancy is one of the modern technologies to enhance fertility and birthrate by medication. However, long-term effects of this technology create a real threat and the risk of cancer of the reproductive and hormone-dependent organs at the later stages of ontogenesis of offspring's. The purpose of this study was an experimental study of the effects of estrogenic drug of on somatometric characteristics of the offspring in the early and later postnatal period of development. Pregnant female mice were treatment sinestrol in a critical period of formation of the reproductive system in subtoxic dose of 50 mkg per animal. All somatometric parameters were measured by electronic caliper with an

accuracy of 0.01 mm. The weight of animals was measured on electronic scales of the touchscreen pocket scale «BS-100» (AWS Inc.) with an accuracy of 0.01 g. The effects of prenatal treatment with sinestrol resulted in accelerated growth of front part of the head, tail, body and hind paws of offspring to 7th day of postnatal development, and alignment and the inversion of the same parameters with control animals on 25 day. Experimental animals had statistically significant high weight of body compared with control animals (7 day: experience - 3.85±0.35 g, control – 6.42±0.39 g, 25 day: 10.4±0.71g and 7.54±0.43 g respectively, $p<0.05$). Thus, prenatal exposure to sinestrol during the critical period of development of organs of the reproductive system affects the growth and can influence on somatometric characteristics of the offspring in the early postnatal period of development.

HISTOLOGICAL CHANGES OF GASTRIC MUCOSA IN PATIENTS WITH CHRONIC GASTRIC EROSIONS CONBINED WITH BILIARY TRACT DISEASE

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Aims: to assess the frequency and type of histological changes in patients with chronic gastric erosions (CGE) combined with biliary tract disease (BTD). Methods: Adult patients (18 - 65 years) with endoscopically confirmed CGE and presence of BTD were eligible to participate (I group). As controls, patients with CGE and duodenal ulcer (II group) and CGE and chronic gastritis (III group) were recruited. Biopsy specimens were taken from stomach due to the Houston-updated gastric biopsy sampling protocol. One expert gastrointestinal pathologist, blinded to all patient clinical information, assessed tissue samples. Atrophy was scored due to Operative Link for Gastritis Assessment (OLGA) staging system. Results: 294 patients (I group – 151, II group – 73, III group – 70) were included into the study with no statistical difference in age and sex between groups. Antral atrophy (I-III stage) was detected in 122 (80.8%) patients of the I group, 58 (79,4%) - of the II, and in 55 (78,6%) - of the III. Corpus atrophy (I-II stage) was seen in 35 (23,2%) patients of the I group, 4 (5,5%) – of the II, and 8 (11,4%) – of the III group. Conclusion: No significant difference in antral atrophy between groups was found (P1-2 = 0.81, P1-3 = 0.70). With statistical significance corpus atrophy was more frequently detected in patients with CGE and BTD, comparing to the control groups (P1-2 = 0.001, P1-3 = 0.004).

ARTERIAL VARIATIONS IN THE PANCREATIC REGION

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The complex arterial system makes the pancreatic interventions technically challenging for surgeons, and interventional radiologists. The arterial variants may alter the tumor resectability, and cause complications in arterial embolization. International data on the pancreatic blood supply are variable; therefore, we aimed to determine the frequency of pancreatic arterial variants in a series of our population. Arteries of human abdominal organ complexes (50) were injected with resin mixture, then corroded. Digital photos and CT images were taken. Classic anatomical variation occurred in less than 50%. Replaced and accessory right hepatic arteries were detected in 12% and 6%, respectively. In one case the proper hepatic artery branched off from the superior mesenteric artery (SMA). The gastroduodenal artery arose from the common hepatic in 86%, from the left hepatic in 8%, from the right hepatic in 4% and in 2% from the coeliac trunk. Superior pancreaticoduodenal artery was found in 10%, while the anterior and posterior superior pancreaticoduodenal artery stem separately in 90%. Inferior pancreaticoduodenal artery was found in 76% and originated with the 1st jejunal in 86%. Anterior and posterior inferior pancreaticoduodenal arteries stem separately from SMA in 22%, from the accessory hepatic (from SMA) in 2%. Single transverse pancreatic artery occurred in 80%, and two in 20%. Except one case, multiple dorsal pancreatic arteries arose from the splenic. Our results stress on the importance of the preoperative radiological analysis. Detection of replaced or accessory right hepatic artery is critical when performing pancreaticoduodenectomy. Insufficient anastomoses may result ischemia after gastroduodenal artery embolization.

CONDUCTION PATHWAYS IN THE ANTERIOR SEPTAL PLACE

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Aim: In the anterior septal place are located accessory pathways of the heart conducting system. The most common of them are Kent Bundles. Our aim in this study was to identify the anatomical characteristics of the area where Kent Bundles persist. Material and Methods: 12 human hearts were dissected. The position of Kent Bundles was determined from a study of serial sections. A variety of stains were employed but the most useful proved to be hematoxillin-eosin and Masson trichrome. Results: One important anatomical finding was the relationship of the atrial septum, the right fibrous trigone and the underlying membranous ventricular septum to the AV node and the Bundle of His. The AV node and the Bundle of His are actually in the posterior septal area with the compact AV node enclosed in the posterior aspect of the atrial septum. The other course of Kent Bundles was from the right atrium to the right ventricle which could be a point anterior to the right fibrous trigone to the arbitrary line separating the anterior septal area from the right free wall. The tendon of Todaro was found in 8 hearts. Conclusion: No other pathways, except Kent Bindles have been found in otherwise normal human hearts in the anterior septal area. This study indicates that the Kent Bundles and the Bundle of His could be within 2 mm of each other. Based on this anatomical information, one possible connection between them in the septal area could be from the anterior edge of the atrial septum to the muscular ventricular septum, skirting the anterior edge of the right fibrous trigone.

ANATOMICAL FEATURES OF THE KNEE ARTICULAR CARTILAGE AND MENISCUS THAT MAY AFFECT PATHOLOGY AND TREATMENT

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Meniscus and articular cartilage lesions comprise a very common clinical entity of the knee joint. There is increased interest on these lesions because: they may be associated with pain and significant disability in relatively young patients; they are characterized by limited healing potential; and result in progressive deterioration of the articular cartilage over time leading to osteoarthritis. Articular cartilage and meniscus are both cartilaginous tissues. Articular cartilage is made up of hyaline cartilage, while menisci of the knee are fibrocartilaginous tissue structures. Chondrocytes are the single cell type found in articular cartilage. The term fibrochondrocytes is usually used to describe the cells of the meniscus, which include three distinct cell populations. The extracellular matrix of both structures consists mainly of water, collagen

fibers, proteoglycans, noncollagenous proteins and glycoproteins with different composition and structure. The collagen fibers of the articular cartilage are primarily type II, whereas meniscus have type I. The differences in cell and collagen types, as well as in composition and structure of these tissues provide their special biomechanical properties and functions. Also, there are differences between lateral and medial meniscus shape, size and attachments. Articular cartilage is avascular, while vessels can be found only in the periphery of menisci. Awareness of the complex architecture of these structures is crucial for a thorough understanding of the pathophysiology as well as proper application and evolution of treatment options which aim to regenerate and develop tissue with structural and mechanical properties similar to the normal meniscus and cartilage.

RELIABILITY OF THE POSTEROLATERAL CORNER OF THE ACROMION AS A LANDMARK FOR THE POSTERIOR ARTHROSCOPIC PORTAL OF THE SHOULDER

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Aim: The present study aimed to evaluate the variability of the posterolateral corner of the acromion (PCA) position in relation to the glenohumeral joint, in a cephalad to caudal direction, to assess whether the universal use of a certain distance from that point will always lead to a consistent placement of the posterior arthroscopic portal of the shoulder. Methods: One hundred and forty dried scapulae (36 women and 34 men) were studied. Measurements included the glenoid height and the perpendicular distance between the PCA and the most superior point of the glenoid. The percentage of coverage of the glenoid by the acromion was defined as the ratio between the two measurements. Student's t-test was used to examine for significant differences between genders and Student's paired t-test between sides ($p<0.05$). Results: The glenoid height was 3.37 ± 0.29 cm on average (range: 2.69 cm to 4.00 cm). The perpendicular distance between the PCA and the most superior point of the glenoid was 0.82 ± 0.69 cm (range: -0.35 cm to 2.27 cm). The percentage of coverage of the glenoid by the acromion was 24% ± 20% (range: -10% to 64%). Conclusion: The position of the PCA in relation to the glenohumeral joint is quite variable. Therefore, the use of a universal distance from the PCA will not always lead to a consistent placement of the posterior arthroscopic portal of the shoulder. Future research is needed in this area to develop techniques to individualize placement of the posterior portal.

ABNORMALITIES OF THE POSTERIOR COMMUNICATING ARTERY IN THE HUMAN PRENATAL AND POSTNATAL PERIOD

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Aim: The aim of this study was to investigate the similarities and differences of abnormalities of the posterior communicating artery from the prenatal to the postnatal period, and to determine their frequency and make a comparison with the data in the literature. Material and Methods: The study was conducted on 200 fetal and 268 adult (aged 20 to 95 years) human brains. Fetuses of the both genders, from 9 to 32 weeks of gestation, were part of a collection of our Department of Anatomy. Adult brains were obtained postmortem from cadavers medicolegally autopsied at the Institute of Forensic Medicine in Niš from 2006 to 2013. During this research the base of the brain was photographed. Quantitative parameters of the fetal and adult abnormal forms were performed by means of an ocular micrometer mounted on a surgical microscope with magnification and ImageJ processing programme, respectively. Results: Abnormal forms of posterior communicating artery, as an infundibular dilatation (2.24%), fenestration (0.37%), partial and complete duplications (3.36%), partial trifurcation (0.37%), and aneurysms (0.75%), were observed in 7.09% of adult cases, mostly on the left side. The posterior communicating artery had abnormal forms in 2% of fetal cases (two fenestrations and two partial duplications). Conclusion: The study demonstrated the occurrence of isolated abnormalities of the posterior communicating artery, as well as their less frequency in fetuses than in the adults.

MEDIAN RAPHE CYST OF THE PERINEUM - CLINICAL AND PATHOLOGICAL CHARACTERISTICS

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Background and Aim: Anatomic components of the penis are the corpus, glands, and prepuce. The corpus is composed of the corpora cavernosa and corpus spongiosus, in the center of which runs the penile urethra. All of these structures are covered by skin and an elastic sheath designated as Buck fascia. Non-neoplastic lesions of the penis are: Median raphe cyst, Mucoid cyst, Mucinous metaplasia, Inflammation of Littré glands, Dermatoses, Primary syphilis, Chancroid, Tuberculosis, Wegener granulomatosis, Behçet disease, Peyronie disease and Condyloma acuminatum. Median raphe cysts are developmental and usually arise on the ventral surface of the penis of young men. The cysts are very rare and describe in the central aspect of the glands, probably represent a cystic dilation of these structures. Most raphe cysts are less than 1 cm in diameter. The contents are usually clear, but they may be turbid if there are abundant mucous glands in the wall. Matherials and Methods: We describe a 50-year-old man with an asymptomatic nodule on the ventral surface of the penis. The nodule was surgically removed under local anaesthesia, and send to histological and immunohistochemical analisys. Results: Immunohistologicaly epithelial cells apeared Cytokeratin-7 (CK7), Epithelial membrane antigen (EMA) positive and anti-S100 protein (S100), Cytokeratin-20 (CK20), smooth muscle actin (SMA) and carcinoembryonic antigen (CEA) negative. Hystological and immunohystochemical findings indicate median raphe cyst. Conclusion: Median raphe cysts are benign lesions formed due to tissue trapping during the development of urethral folds. The associated symptoms and signs should be taken into consideration when determining the treatment for the cysts. The diagnosis should use histological and immunohistochemical analisys. Histologicaly it presents cystic dilation of accessory urethral canals or periurethral ducts.

ANTROPOMETRICAL PARAMETERS OF GROWTH IN CHILDREN AGED 4

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Aim: Evaluation of the sex-specific differences of anthropometrical parameters wich are used as indicator of growth in children aged 4. Methods: They were measured 200 healthy

preschool children (110 females and 90 males) at the age of 4 of Macedonian population. The 12 anthrop-ometrical parameters were measured which define longitudinal, circular and transversal measures of skeleton use standard equipment and measurement technique. The following indexes were calculated: weight-for-age; height-for-age, weight-for-height, BMI (body mass index). Tree skin-folds were measured (triceps, scapula and abdomen). Results: There were determined sex-specific differences in almost all anthropometrical parameters but there were not significant. 4 year old girls have slightly higher mean values for body weight, body height and BMI than boys. Values of the 50th percentile in girls were 19.8 kg for BW; 107.45 cm for BH and 16.96 kg/m². The values of these parameters in boys were 19.2 kg for BW; 107.51 cm for BH and 16.15kg/m² for BMI. Conclusion: The results can be used as criteria for assessment and detection of abnormalities in nutritional status in children aged 4.

DEVELOPMENTAL ABNORMALITIES OF THE HUMAN THYMUS – FROM PHYLOGENY TO ONTOGENY

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Thymus is a central lymphoid organ with an important endocrine function. Thymic morphology varies greatly even in the same age group. Anomalies of the thymic shape, size and localization are explained by the disruption of thymic primordia formation and/or disruption of its descent from the neck to the mediastinum. The most common thymic anomalies include anomalies in number of the thymic lobes, ectopic thymus, accessory thymic tissue, thymic aplasia, thymoparathyroid aplasia (DiGeorge syndrome), thymic hypoplasia and hyperplasia. The presence of accessory thymic tissue reflects a failed migration of the whole thymic primordia from the third pharyngeal pouches. It may be found at any level of the pathway of normal thymic descent, from the angle of the mandible to the superior mediastinum. The prevalence of foci of accessory thymic tissue varies according to several authors from 1.8% up to more than 50%. A cystic version of accessory thymic tissue localized in the neck is called “congenital cervical thymic cyst”. The cystic version of aberrant thymic tissue is more often described in the literature than the “classical” solid form. Thymopharyngeal duct cyst is another special and extremely rare variant of cystic accessory thymic tissue. Only circa 5 cases are described in the literature. Relatively common and asymptomatic anatomical variation is the fusion of thymus with one or more parathyroid glands - much common with the inferior due to common embryonic origin of both organs.

PULSE WAVES ASYNCHRONOUS ARRIVAL TO THE CEREBRAL CIRCULATION

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Aim: The circle of Willis (CW) is recognized as compensatory system in the case of arterial occlusion. Several arguments hold the compensatory theory as incorrect. (I) Current theory is anthropocentric; it ignores other species and their analog structures. (II) Arterial pathologies are diseases of old age, appearing after gene propagation. (III) According to the current theory, evolution has foresight. (IV) Its commonness among animals indicates that it is probably a convergent evolutionary structure. (V) It was observed that communic-ating arteries are too small for effective blood flow, and (VI) missing or hypoplastic in the majority of the population. It was previously recognized that CW might serve as a passive pressure dissipating system, a pulse wave attenuator. In order to serve as attenuator, asynchronous arrival of pulse waves into the cerebral circulation has to occur. Methods: In all subjects measuring horizontal plane was selected distally as possible as long as both internal carotid arteries (ICA) could be visualized. Passage of the pulse waves (expansion of arteries) was detected using simultaneously ultrasound (B mode) and ECG. Time of travel was determined as elapsed time from the R wave (of QRS complex) to time when ICAs expanded. Results: Difference in pulse wave time of travel to the measuring horizontal plane was observed between right and left ICA ($p<0.05$). Pulse wave reaches cerebral circulation earlier on the left side. Conclusion: Pulse waves of ICAs reach cerebral circulation asynchronously. Therefore, CW and its communicating arteries might protect cerebral arteries and blood brain barrier from hemodynamic stress.

PATTERNS OF SUPERFICIAL VEINS OF THE CUBITAL FOSSA IN CAUCASIAN POPULATION

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Aim: This study was designed to determine the patterns of superficial veins of the cubital fossa in Caucasian population. Methods: For the objective of the study, we examined 169 subjects (135 male and 34 female) i.e. 338 arms (right and left). Tourniquet was applied at the mid arm of every subject to made more prominent superficial veins of the cubital fossa and forearm. The veins were identified on the skin and pattern was accurately drawn on the form. Results: Nine venous patterns were determined, one new. Doubled brachial cephalic vein in "M" shaped arrangement was first described. The most common was "M" shaped arrangement, in 115 (34.02%) of the arms and the following was "N" shaped arrangement, in 97 (28.69%) of the arms. The frequency of the other patterns was far less. Same type of pattern in both arms had 111 subjects (65.68%) while the remaining 58 (34.31%) had different patterns in each arm. Conclusion: Cubital venous patterns shows variations in number and frequency in different populations and our study confirm this. Knowledge of these variations would be very useful for many medical procedures.

SUPRACONDYLAR PROCESS OF THE HUMERUS AND THE SUPRACONDYLAR PROCESS SYNDROME

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The supracondylar process is a bony spur, which is found on the shaft of the humerus about 5-7 cm above the medial epicondyle. The occurrence is about 1-2%. The length of this spur can vary from a few millimeters to more than 1 cm. In the case of larger development or fracture, the supracondylar process may compress anatomical structures which pass under it, i.e. the median nerve and the brachial artery. In some cases a ligament was seen withdrawing from the process towards the medial epicondyle, so-called Struthers´ ligament. The above mentioned structures may predispose compression of the median nerve, so-called supracondylar process syndrome. The occurrence of the supracondylar

process was studied in five osteological collections of various dating from the Moravian territory. The occurrence of the spur at individual localities was following: Vedrovice (6000 BC) – 1,1,%; Hoštice za Hanou (3000–2000 BC) – 1,1%; Maloměřice (400–50 BC) – 2,6%; Pohansko (9th century AD) – 0,9%; Osteological collection of our department (13–18th century AD) – 2,1%. The results were related to the number of the humerus not individuals. Moreover a radiographic study of the current Czech population was made. The supracondylar process occured in 0.59% of 836 x-ray images, which were studied. The results of this osteological study show, that the frequency of the spur seems to be rather continuous over the centuries. A decrease was observed only in the current population. Furthermore, in the present a study on ontogenetic and phylogenetic development of the supracondylar process of the humerus is performed.

LOW VOLUME DISTRIBUTION PATTERNS IN CT-GUIDED LUMBAR SYMPATHETIC BLOCKS: IS THERE A LIMIT? AN ANATOMICAL-RADIOLOGICAL STUDY

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Introduction: The amount of injected volume for lumbar sympathetic block highly depends on the technique, blind of with the help of visualization. The study aims to investigate the distribution patterns of low volumes to define an ideal volume. Materials and Methods: 18 cadavers embalmed with Thiel´s method were investigated. A CT guided dorsal approach to the lumbar sympathetic trunk was performed. After correct needle position confirmation by injection of 1ml of contrast, steps of 1ml of contrast were repeated to reach a final volume of 5ml. Each injection was followed by CT investigation. In addition, each of the CT investigation steps was reconstructed 3 dimensionally. Measurements were performed from the centered needle peak in cranial, caudal, lateral, medial, ventral and dorsal direction. Results: Mean distance of dorsal spread was documented at 1 ml injection with 7mm, 2mL of 10mm, 3mL of 13mm, 4mL of 15mm and 5mL of 16mm and represented the minimal documented distance. All other directions showed higher values. 3ml and higher volumes showed no significant increase of distances. Adjacent structures such as aorta, inferior vena cava of psoas muscle were already reached with volumes 1 to 2ml. Distribution pattern was not dependent on sex, weight, height or even side of the cadaver. Conclusion: An injection volume of 3ml seems to be the maximum limit of local spread. Distribution patterns of volumes higher than 3ml show no significant change.

SOMATOMETRIC AND BEHAVIORAL CHARACTERISTICS OF THE MICE OFFSPRING IN EARLY POSTNATAL DEVELOPMENT WHICH WAS PRENATALLY TREATMENT WITH FULVESTRANT

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It is known that of pregnant patients with breast cancer are treated with anti-estrogenic drugs which have adverse and not preventable effects on the offspring. The clinical monitoring of such offspring is missing. The purpose of this study was an experimental study of the effects of anti-estrogenic drug of fulvestrant on somatometric and behavioral characteristics of the offspring in the early postnatal period of development. Pregnant female mice were treatment fulvestrant in a critical period of formation of the reproductive system in subtoxic dose of 200 mkg. The effects of prenatal treatment with fulvestrant resulted in accelerated growth of tail, trunk and hind paws of offspring to 20th day of postnatal development, followed by alignment of the body length with control animals on 30 day. Experimental animals had statistically significant high weight of body compared with control animals (20 day: experience - 10.5±0.57 g, control – 8.9±0.29 g, 30 day: 15.1±0.5 g and 12.4±0.34 g respectively, $p<0.05$). Also was studied the behavior and anxiety level of offspring. Testing of the behavior of 30-day mice in the test "open field" revealed a statistically significant increased exploratory activity of animals of the experimental group, increasing of time of locomotor activity and the amount of intersected sectors, increased time of the vertical activity and a decrease of the amount of uprights to compared to the control animals. Thus, prenatal exposure to fulvestrant during the critical period of development of organs of the reproductive system affects the growth and behavior of the offspring in the early postnatal period.

CONTACT WITH CADAVERS DURING MEDICAL EDUCATION

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Introduction: Study of regional anatomy through cadaveric dissection is a unique feature of medical studies. Working with cadavers causes some problems. Most of the students for the first time in their life think about death as an inevitable end. Their reaction to dissection and learning anatomy on cadavers is different. The aim of this study was to show the anxiety and other reactions of students during their work with cadavers. Materials and methods: The research was made using a specially designed questionnaire. The study included 206 students of the first year at the Medical Faculty in Skopje, attending practical courses of anatomy. Results: The results obtained showed that mild anxiety predominated among the students (36%). Most of them would not avoid injections and small surgical procedures (65%), hospitals (78%), contact with blood (85%), thought of illness or injury (60%), visit to a dentist (63%). Encounter or thought of dead body make them a little confused (41%). The differences between the answers were statistically significant in the three tested groups ($p<0,01$). Conclusion: Dissection on cadavers is precious experience which should be afforded even in this era of medical reforms in our country.

BMPS AND THEIR ANTAGONISTS IN DEVELOPMENT AND GROWTH OF HUMAN KNEE JOINT OSTEOPHYTES

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The osteophytes are bone spurs overgrowing the edge of the articular cartilage during the course of osteoarthritis (OA). Although the cellular mechanism of their development and growth is revealed and resemblin normal bone development, there is still debate concerning molecular mechanism of their growth. Since the role of bone morphogenetic proteins family members (BMPs) in bone development is well established and documented, the members of the BMPs as an important member of the local grpwth factor network and their extra-cellular inhibitors were recognized as an important factors that could modulate, even cease development and growth of osteophytes. The aim of our study was to analyse expression and localization of the most potent osteoinductive BMP-2, -4 and -7, and their extracellular inhibitors gremlin, chordin, follisatin and noggin. The study was performed on tissue

collection of 25 osteophytes collected during total knee joint replacement surgery due to severe OA, and on 10 samples of normal knee joint tissues from individuals undergoing autopsy. The expression of molecular factors was analysed using immunohistochemistry and Western blot analysis. Our result demonstrate the significant differences in BMPs and their antagonists expression between normal and OA affected joint tissue and suggest the potent role of these molecular factors in pathogenesis and / or mechanism of growth and development of human knee joint osteophytes.

RHBMP-7 TREATED IRBR IMPLANTS ON RAT CALVARIAL DEFECTS

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Aim: The cellular and molecular sequences of the osteogenesis induced by rhBMP-7 bound to inactive rat bone residue (IRBR) as a carrier implanted in rats have been studied at calvarial defect. Methods and experimental design: To create a parcial defect of calvarial rat bone, periosteum and bone of the frontoparietooccipital complex were grinded with dental burr and special care was taken to avoid cranial wall opening. The implants were harvested at day 7th, 12th and 21th. Tissue samples were analysed by histology, histochemistry and histomorphometry. Results: The results of this study showed different initial tissue response in relation to control samples of implants (contain no active osteoinductive BMP-7). On rat calvarial deffect BMP-7 induced direct bone formation (intramembranous bone formation) and fuses with the underlying bone deffect. In the underlying bone remodeling is active as early as day 12th and is completely fused with the impalnt by day 21st. The results of histomorphometry showed more prounanced and rapid osteogenesis in relation to control animals. Conclusion: The results of this study suggest that rhBMP-7 induced early bone formation and promote osteogenesis to deffect healing. The bone forming process is manly direct ie. intramembranous bone formation.

