Resumenes

THE 7TH INTERNATIONAL SYMPOSIUM OF CLINICAL AND APPLIED ANATOMY

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KEYNOTE LECTURES

STUDENT ASSISTANTS TRAINING FOR ANATOMY TEACHING AND RESEARCH

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Until a few years ago, national universities in Argentina were not only free of charge but also had free access. The "Student Assistant System" created to initiate young people in teaching activities (mainly in basic areas of knowledge) turned then, into good human resources for careers with thousands of students and a never enough number of professors. Since the beginning, nearly 50 years ago, up to now there have been many changes and the role of student assistants in Anatomy has developed, increased and generalized, independently of the number of students. At the present, the Chair of Anatomy is the most requested by students and we receive a variable number of AS (up to 120). Admission depends on a contest and on the first year they have to go on special courses on teaching and research training. Student Assistants collaborate with practical activities for first year students and participate in research projects. Depending on their interest, they attend to scientific meetings and may also publish scientific papers. Communication with students, interest, enthusiasm and results improve with the participation of other students acting in their teaching process, and it is also a benefit for student assistants' point of view. Curricular history in the Chair of Anatomy facilitates the access to the medical residencies, mainly for surgical specialties. After finishing their postgraduate training and depending on the Chair needs and possibilities, some of them will become Assistant Professors and continue their anatomical career.

TEACHING AND EVALUATION OF HISTOLOGY USING E-LEARNING MOODLE SYSTEM. AN EXPERIENCE AT BRITISH UNIVERSITY IN EGYPT

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The increasing number of university students poses a problem to the developing stress on the quality of the education process yet a solution emerged from the tremendous progress in technology. The term e-learning denotes the use of electronic technology within the process of education. Using this as a means of interactive and long-distance education is currently implemented in some Egyptian private universities using an open source software named Moodle. Within the university, the Histology department has succeeded in posting all of the course materials as well as various exam models over their Moodle.This proved to be an utter savior during the times of instability that hindered the learning process negatively impacting on the educational system. E-learning enabled 24/7 communication between the staff and the students for interaction and assessment. It also made examining and assessing the students possible without time and place acting as obstacles. Nevertheless, the software itself is still undergoing upgrading. The need for internet access, which might not be available to everyone and the lack of well-trained staff to use it are also hampering to achieving the maximum benefit. The use of advanced technology is becoming a need and implementing Moodle in a more integrative way is a must. Accessing educational materials, posting model exams, assignments online and even utilizing it for the final exams will help achieve higher levels of quality

within the educational system. Adding training staff members on implementing and upgrading it to their needs and we ensure ultimate benefit

INNOVATIVE AND INTERACTIVE LEARNING TOOLS ENABLE HISTOLOGY COURSES TO BE NOW PRESENTED TO STUDENTS COMPLETELY ONLINE – CASE STUDIES FROM SEVERAL UNIVERSITIES

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The teaching of histology is expensive particularly in some universities with limited or aging resources such as microscopes and inadequate histological slide collections – and increasing numbers of students. Laboratory classes are staff intensive. Technology can now solve many of these issues and also caters for the self-directed and independent learning needs of students. This presentation will demonstrate a series of innovative learning resources that have enabled a histology course to be presented completely online – including practical classes! This histology course has not only been delivered to students attending my own institution but also to a number of other students attending universities worldwide but facilitated by histology instructors on the other side of the globe! Innovative learning tools include an updated interactive histology atlas and an interactive platform for viewing histological slides using virtual microscopy. Students can annotate their histological sections and view annotations of histological features as they view sections at any desired magnification. A learning platform also includes a series of assessment packages; discussion forums encourage student interactions with their peers as well as with histology instructors. One new additional resource and one highly acclaimed by students is a series of at least 31 professionally recorded lectures whereby students see their lecturer visually as well as viewing informative power-point slide presentations! Quantitative data from formal student evaluations verify that all traditional learning outcomes in an extensive histology curriculum delivered in medical, dental and biomedical science courses can be achieved.

HOW DO TEAR DRAIN? – FUNCTIONAL AND CLINICAL ANATOMY OF THE NASOLACRIMAL SYSTEM

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The nasolacrimal ducts are a border area of both disciplines ophthalmology and otorhinolaryngology which work closely together in the treatment of nasolacrimal disorders. During recent years a bulk of new diagnostic and therapeutic methods like nasolacrimal endoscopy, laser assisted dacryocysto-rhinostomy, transcanalicular surgery or interventional radiological therapies are applied to the nasolacrimal system. However, the common knowledge about anatomy and physiology of the nasolacrimal ducts and of tear flow through the nasolacrimal passage is often at the dark ages. The talks summarizes the function of the ocular surface, lacrimal apparatus and tear film, describes recent advances about the nasolacrimal ducts and discusses them in a context with nasolacrimal duct physiology. Moreover, the patho-physiology of the three major alterations of the human nasolacrimal ducts the clinician is confronted with in his daily practice will be discussed.

INVITED LECTURES

HISTOMORPHOLOGICAL FEATURES OF DYSPLASIA AND SURVIVIN PATTERN IN ADENOMATOUS COLON POLYPS

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Introduction: Survivin plays important role in regulatory mechanisms of apoptosis. Moreover, it is involved in regulation of cell cycle and stimulates angiogenesis. Material and methods: Immunohistochemically, we study the survivin expression in a series of 116 tubular adenomatous colon polyps to determine its association with clinical and morphological parameters such as age of patients, size of polyps, degree of dysplasia and polyp localization. In each section, the subcellular localization of survivin antigen and the intensity of staining were assessed. Results: Survivin was expressed in 90 cases (77.6%). Nuclear and combined nuclear and cytoplasmic positivity was observed in 44/116 cases (37.9%) while solely cytoplasmic reaction in 46/116 cases (39.7%). Low grade dysplasia was diagnosed in 64 cases (55.2%) and high grade dysplasia in 52 cases (44.8%). Statistical analysis revealed a significant correlation between subcellular survivin localization and the degree of dysplasia, size of polyps and colon localization. Significant trend was confirmed between intensity of survivin immuno-reaction and tumor size, and dysplasia grade, and also the trend between negative/strong survivin intensity and polyp localization; significant association was found between the degree of dysplasia and the size of polyps. Conclusion: Our recent results suggest that the nuclear and combined nuclear and cytoplasmic survivin localizations are strongly associated with poor prognostic parameters in the assessment of colon adenomas. Thus, anti-apoptotic protein survivin may represent a promising biomarker in immune-histochemical evaluation of colon adenomas with dysplastic changes.

THE ANATOMIC COURSE OF THE INFRAPATELLAR NERVE TO DEFINE SAFE ZONES FOR POSTERIOR KNEE ARTHROSCOPY

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The surgical indications for arthroscopy in the posterior compartment of the knee joint are increasing as minimally invasive procedures of the knee evolve. However, the posteromedial portals at the knee are known to have a risk of injury to saphenous nerve and its infrapatellar branch. The aim of the present study is to define a safe intra-articular entrance point based on standard anatomical landmarks with minimum or no risk of injury to any neurovascular structures. A total of 31 knee joints (12 formaldehyde embalmed, 6 Thiel embalmed, 15 fresh) were used. The course of the saphenous nevre and its infrapatellar branch was first determined in embalmed cadavers than an ideal site for portal replacement was searched with the knee flexed 90°. The joint was at the level of the line passing through the inferior edge of the patella (IP line). The ideal site of the posteromedial portal was defined as the point where the line drawn through medial epicondyle intersects the IP line perpendicularly. The saphenus nerve was lying posteroinferior to the defined portal, the closest mean distance being 1.8 cm and its infrapatellar branch was lying anterosuperior, the closest mean distance being 2.3 cm. The arthroscopy performed through this portal revealed the technique is excellent for visualizing intra-articular anatomy. Results of this study suggest the establishment of posterior portals through the defined points while the knee is flexed with 90° ensures safety of neurovascular structures.

RISKS IN PUDENDAL INNERVATION DURING DELIVERY

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Childbirth is a physiological process in human reproduction. Stress to soft tissue is made by a head of the newborn and leads to different kinds of impairments – from impaired muscle-ligamentous structures, through the vascular injury to injury of nerves. One of the most often injured nerves is pudendal nerve. The aim of this study was to analyze the risk of injury to nerve and its branches during childbirth from the morphological and biomechanical point of views. Dissection of 38 hemipelves was performed to study the course of pudendal nerve. For biomechanical analyses of the pelvic floor model was used Finite Element Method. The model of the pelvic floor was created from CT and MRI scans of a young healthy woman. We simulated the childbirth by rigid

ball which was moved through the pelvic floor following trajectory defined in literature. Results from realized experimental measurements were compared with results obtained from FE analyses and with results in literature. We found that risk to the pudendal nerve is not as high as described in the literature.

EVALUATION OF FOOT ASYMMETRY IN RELATION TO HAND PREFERENCE: PRELIMINARY ANALYSIS

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Introduction: Development of right and left extremities occur through similar morphogenetic mechanisms, nevertheless a perfect symmetry is out of the question. This may either be overtly presented as it is in some kind of musculoskeletal disorders or may be insignificant without being related to any pathological condition Anthropometrical studies comparing two halves of the human body depict differences; however there is no study in the literature evaluating the foot asymmetry in relation to hand preference. The aim of the study was to evaluate the asymmetry of the foot in relation to hand preference and gender. Material and Methods: 130 males and 167 females aged between 18 – 44 years participated in the study. Plantar images were obtained using a special designed podoscope system. These images were analyzed using Digimizer V4.3.0. Foot length, foot width and plantar area were measured for right and left foot. An asymmetry index is calculated for each pair of measurement with R-L formula. Hand preference was assessed using Edinburgh Inventory. Independent samples test was used for statistical analysis. Results: There were no statistically significant differences between males and females in terms of asymmetry index values of foot width, foot length and plantar area ($p>0.05$). There were no statistically significant differences between right- and left-handers in terms of asymmetry index values of foot width, foot length and plantar area ($p>0.05$). Conclusion: Depending on these results it can be suggested that asymmetry condition of the foot is not affected by gender

RADIOLOGICAL EVALUATION, 3-D RECONSTRUCTION OF FACIAL NERVE AND ITS ANATOMICAL CONFIRMATION WITH NEIGHBORING STRUCTURES IN THE SURGICAL PLANNING OF TEMPORAL BONE AND POSTERIOR FOSSA LESIONS

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Objective: Surgical planning and evaluation of related anatomical structures of surgical corridor is important for posterior fossa and lateral skull base surgery. The aim of study was to evaluate facial nerve and related structure with 3-D reconstruction of radiological images and its anatomical confirmation on cadavers. Methods: 3-D reconstruction was performed MR and CT scans were imported into the imaging software program OsiriX v.3.7.1. This preliminary study was performed on 5 cadaver heads from Department of Anatomy and MR and CT scans of 10 patients from Department of Radiology and Neurosurgery and anatomical comparison of the structures was discussed. Results: 3-D reconstruction of radiological images was performed for facial nerve, semicircular canals and cochlea and after dissecting the facial nerve segments in cadavers the 3-D course of facial nerve was evaluated and reconfirmed anatomically. Step by step representation of the corresponding structure was obtained. In some patients lesions of posterior fossa were also indicated and preoperative evaluations were performed. Precise understanding and this novel combination allows to correlate and to confirm of the neuroanatomical structures before surgery. Concl-usion: During lateral skull base and posterior fossa surgery novel and easy combination of radiological and anatomical data of 3-D course of facial nerve was described. This easy preoperative evaluation can help surgeon to be navigated and to understand the complicated anatomy and relations for each patient. This combination model is a useful tool for postgraduate education of surgeons and for further morphometrical studies.

LYMPHATIC DRAINAGE IN PATIENTS WITH CUTANEOUS MELANOMA

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Malignant melanoma is more frequently seen in Caucasians living in sunny regions. It representing 4% of all skin tumors, but being responsible for 79% of skin cancer deaths. The mechanism through which melanoma cells spread to the lymph nodes is a key to understanding and preventing metastasis. Melanoma shows preference for early spread through the lymphatic system and metastasis of melanoma to the regional lymph nodes is one of the principal indicators of tumor aggressiveness. Many questions regarding the mechanisms of metastatic spread via lymphatic vessels in human malignancies are still unanswered. Also, unclear is whether the metastatic spread occurs via the lymphatic vessels at the tumor periphery or through de novo lymphatic vessel formation. Clinical prediction of lymphatic drainage from the skin is not possible. Patterns of lymphatic drainage from the skin are highly variable from patient to patient, even from the same area of the skin. Unexpected lymphatic drainage from the skin of the back, head and neck, upper and lower limbs has been found. Drainage across the midline of the body is quite frequent on the trunk and in the head and neck region. Sappey defined demarcation lines that passed down the midline front and back, along a horizontal line around the waist at the level of the umbilicus anteriorly, and to the level of the L2 vertebra posteriorly. However, recent studies conducted around the world have shown that skin lymphatic drainage is clinically unpredictable. The most skin regions showed symmetric lymphatic drainage about the coronal midline of the body

THE INTERCAROTID FASCIA: EXISTING OR NON-EXISTING

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Introduction: The ongoing discussion concerning the interpretation of existing or not existing fasciae on the neck needs a clarification and a valid terminology. An example is given by the different interpretations of the intercarotid fascia. Materials and Methods: Based on the dissection experience of the last four decades and therefore of about 1000 cadavers, the intercarotid fascia was dissected and photographically documented. All dissection of the last two decades were performed on cadavers fixed with Thiel´s method and were done when the neck region was still untouched. Results: The intercarotid fascia was identifiable in each cadaver, orginated from the vagina carotica laterally to pass the visceral organs dorsally with possible fusion to the buccopharyngeal fascia either on the most laertal part of the pharynx or at the dorsal wall. Conclusions: The existence of an intercarotid fascia is crucial for a correct interpretation of any bleeding or inflammation processes, because it changes the topography of the existing spaces such as the retropharyngeal or “Danger space” as well. As a consequence, the existing terminology should be discussed and needs to be adapted.

3D PRINTING AS A TOOL TO DEMONSTRATE SURGICALLY-RELEVANT RESULTS OF ANATOMY STUDIES: ARTHROSCOPIC ANATOMY OF THE WRIST

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Introduction. The palmar radiocarpal ligaments are essential for wrist stability. Their damage or disfigurement is involved in a number of common instability disorders and contributes to degenerative joint disease. The traditional, or open, view of the palmar ligaments is the mainstay of research and education when considering this area. However, an increasing number of surgical procedures are done arthroscopically and hence only involve visualisation of the internal (dorsal) surface of the palmar ligament. This area is difficult to visualise and not easily correlated to the classical palmar view. This study aims to demonstrate the effectiveness of 3D prints in visualising this area. Materials. Embalmed (n=34) and unembalmed (n=6) specimens were dissected. Dorsal arthroscopic dissection followed by an “expanded arthroscopic” approach, previously described by Fogg (2010), was used to expose the internal surface of the palmar ligaments. Their palmar surface was exposed using traditional dissection. The ligaments were rendered into a 3D virtual environment using a laser scanner. Results. The external surface revealed 3±1.2 distinct bands. The internal surface demonstrated 4±1.7 distinct bands. The size and arrangement of the ligamentous surfaces were different. Conclusion. Arthroscopic wrist surgery presents a unique view of the radiocarpal ligaments. This view is not compatible with the external understanding of these ligaments that most surgeons and anatomists will have. It is therefore important to highlight these differences and continue to describe the arthroscopic view of anatomy at all levels of training. 3D printing makes these differences more obvious and facilitates greater interactive learning from dual vantage points

HOW STUDENTS CAN BE INVOLVED IN EDUCATION OF MORPHOLOGY?

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Can be students involved in education of morphology? Do students belong on the other bank of the educational process? This question is faced by a professional teacher and an undergraduate student teacher, both being involved in the teaching process at the Third Faculty of Medicine, Charles University in Prague. The current adverse situation in theoretical subjects at universities poses the question of student involvement in the teaching process. Students have been an inseparable part of education during dissection courses at all faculties throughout our country for many years. For more than 20 years they have been participating in education in both bachelor and master study program. The have been teaching as auxiliary and main assistants responsible for an individual group of students, both in the seminaries and practical classes. What are the pros and cons viewed from both points of view – authorities and students?

ANATOMY EDUCATION FOR DENTAL STUDENTS AFTER CHANGING CURRICULA

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Introduction: Dental students have an opportunity to study many kinds of educational books from head and neck regions, but there is a big gap in regulations given to them concerning the amount of knowledge from trunk and limb regions. Based on changing curricula, mentioned in recent years, it was necessary to prepare appropriate textbook for dental students to follow new rules in academic program Dental Medicine. There was a need to prepare this type of educational material both for Slovak and English speaking students. Material & Methods: Anatomy lectures and practical sessions were adapted to a new curricula not only in terms of teaching time devoted to subject, but more important to the modification of the content of the subject according to a new teaching program. Results: To follow these criteria, it was prepared a new study material for students in form of textbooks in Slovak and English languages. More than one hundred of original color pictures and schemes demonstrate the most important anatomical structures of the trunk and limbs of human body. Because some organs inside the thorax, abdomen, and pelvis are parts of functional systems, they were described in textbook as the whole systems. Conclusion: New textbook represents an educational aid for dental

students in study anatomy of human body. While there are clear criteria for head and neck region to be studied, there is an answer for the questions concerning the amount of studied information for the rest of the body.

DISTRIBUTION OF ALFA-SYNUCLEIN IN ENTERIC NERVOUS SYSTEM

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There is an urgent need for biomarkers of Parkinson´s disease (PD). Routine colonic biopsies allow the demonstration of α-synuclein pathology in colonic mucosa and submucosa in living PD patients. Localization of α-synuclein aggregation is typical not only in the enteric nervous system (ENS), but also in other cells frequently seen in the digestive tract (macrophages, plasma cells). Four healthy control, 4 PD patients and 9 healthy patients with positive screening for PD risk factors underwent routine colonoscopy and the bioptic material from ascendent and sigmoid colon was analysed by immune-histochemistry using antibodies against α-synuclein and phosphorylated α-synuclein. For visualization of CD68 positive cell population we used anti human macrophage (CD68) monoclonal antibody and secondary fluorescent anti-mouse antibody Alexa Fluor 488. α-synuclein positive aggregates were detected in nerve fibres of lamina propria mucosae of all PD patients and 6 out of 9 patients with positive screening. Strong α-synuclein positive monocyte-macrophage cell population was detected in PD and positive screening patients. Phosphorylated α-synuclein was present in PD, positive screening and also healthy control patients. In the fluorescent microscope CD68 positive cells were present in both PD and positive screening patients. Our results showing presence of α-synuclein aggregates in colonic nerve fibres and monocyte-macrophage cell population in healthy patients at risk for development of PD, support the theory of colonic α-synuclein biopsies as potential premotor biomarker of PD and can serve as a model for testing this hypothesis.

EVALUATING REGENERATION OF IN VIVO EXPERIMENTAL ORGAN DEFECTS USING QUANTITATIVE HISTOLOGY

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A number of growth and differentiation factors are involved during tissue healing to restore cells, extracellular matrix, and microvascular bed in experimentally induced wounds. These processes may be targeted and promoted by in vivo implantation of bioengineered meshes and fibres. The lecture reviews several histological studies performed using animal models for in vivo evaluation of wound healing and tissue integration of biomaterials: (i) healing of bone defect, (ii) healing of articular hyaline cartilage, (iii) healing of skin wounds, (iv) healing of abdominal closure, and (v) vascular reaction to implantation of arterial bands. All the histological methods demonstrated in these studies were based on systematic uniform random sampling of blocks, sections, and fields of view. The morphometry was performed using continuous variables. These were acquired using design-based unbiased stereological techniques applied for quantitative analysis in histopathology. Thus, groups of samples under study were comparable in an unbiased way using standard statistical proce-dures for testing various biological hypotheses. Supported by the SVV 260 047 and PRVOUK P36 Projects of the Charles University in Prague and by the National Sustainability Program I (NPU I) Nr. LO1503 provided by the Ministry of Education, Youth and Sports of the Czech Republic.

NOVEL MACROSCOPIC AND HISTOLOGICAL DATA FOR THE PCL IN TOTAL KNEE REPLACEMENT: TO RETAIN OR NOT?

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The PCL originates from the lateral surface of the medial femoral condyle and inserts into the posterior indercondylar fossa of the tibial plateau. It consists of two bundles, the anterolateral (AL) and the posteromedial (PM). The PCL plays a crucial role in total knee replacement (TKR). Two main implants are used for primary TKR, the cruciate retaining (CR) where the PCL is preserved and the posterior stabilized (PS) where the PCL is resected and substituted by the protheses. Both systems have comparable results and there is a debate in the literature over the preservation of the PCL or not. In CR TKR it is questionable how much of the PCL is retained and if the remaining bulk of the PCL is functional or not. Novel macroscopic intraoperative data demonstrated that PCL tibial attachment is not located far enough from the articular surface to be spared following the tibial plateau resection during a CR TKR. Specifically, the intraoperative measur-ements showed that almost two thirds of the PCL is possibly removed. Removal of the anterior two thirds of the PCL leads to resection of the AL bundle. Thus alterations of femorotibial kinematics might be expected which may be one reason for the contradictory kinematic data in the literature following CR TKR. Furthermore, the microstructure of PCL obtained at the time of TKR is characterized by distinct histologic degenerative changes. This may explain the finding that the PCL in osteoarthritic knees is biomechanically abnormal. In conclusion, during CR TKR the remaining bulk of the PCL is slender and degenerated. These findings question the long term adequacy of the PCL to perform its function following a CR TKR, which is to resist anterior translation of the femur during knee flexion.

ORAL PRESENTATIONS

TESTICULAR MORPHOLOGY IN SPONTANEOUSLY HYPERTENSIVE RAT: OXIDANT STATUS AND STEREOLOGICAL IMPLICATIONS

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Introduction: Studies by researchers suggest that reductions in blood flow to the testis could play an important role in the pathogenesis of male infertility. Such decreases in blood flow may very likely have profound effects on tissue morphology that ultimately predisposes to various forms of hypo-spermatogenesis with consequent compromise in reproductive capability. Methods: We conducted a systemic review of literature relating to testicular morphology under hypertension in animal models using Pubmed, Google Scholar and other search engines. Results/discussion: With varying opinions expressed by experts as to the actual culprit or potential pathway and/or effects of pathophysiology of testicular haemodynamics, it still remains debatable whether the observed degenerative changes in testicular tissue are the result of major or minor reductions in flow or the consequence of other vascular pathologies or even extraneous factors. The investigation of these factors occurring under hypertensive states using the spontaneously hypertensive rat (SHR) as an experimental model has attracted substantial attention in recent past. This review examines the relationships and potential morphologic changes in the testicular tissue under conditions of perturbations in blood flow as seen in the SHR with a view to the proper understanding of the role(s) of various factors that contributes to male subfertility. Conclusion: A suggestion to the use of stereological methods for quantitating various measurements in a highly active and dynamic structure like the testis with its arterial system has been added as this may facilitate a better understanding of the mechanisms implicated under hypertensive conditions.

PFN POSITIONING – BIOMECHANICAL EVALUATION OF STABILITY IN TROCHANTERIC FRACTURE TREATMENT

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Proximal femoral fractures are among the most commonly sustained fractures and their frequency is increasing due to aging of the population. This trend is particularly evident in trochanteric fractures. The incidence of complications in treatment of the trochanteric fracture remains unsatisfactory. The objective of the study was to identify the risk of trochanteric fracture osteosynthesis failure during correct and incorrect proximal femoral nail implant placement. The finite element method was used to analyze the responses of femoral bone tissue and PFH to an external load. Five FE models were created to represent various PFN positions which may occur in clinical practice. Models have shown that in stable fractures healing does not depend on absolutely precise positioning and the risk of failure for the entire fixation is low. Supported by GAUK 420411/2011 and OPPC CZ216/3100/24018.

STARTED FROM VESALIUS, NOW WE'RE HERE. A LESSON IN ACADEMIC FITNESS LEARNED FROM CORPSE DISSECTION HISTORY

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Introduction: The dissection of human corpses for educational purposes has always played a particular role in modern medical education. In spite of the ever decreasing share of curricular gross anatomy in the last 50 years, corpse dissection remains an obligatory feature in many medical schools. Has the impact of corpse dissection on the medical initiation of students changed since the rise of the scientific anatomy in 16th century Italy? How does this educational method still influence students' transformation into medical doctors?. Material and Methods: The evolution of corpse dissection for educational purposes ever since ancient times was documented. 'Anatomy lesson' artworks helped for a better understanding of each evolutionary stage. The academic tasks required in the 1st year of medical school have been compared to physical training objectives, and a parallel between the qualities necessary to complete them was established. Results: From the empiric times of illegal dissection to the ethics-concerned age of the 'anatomical gift', corpse dissection fueled the curiosity and the altruistic motivation of future doctors. The main stress in nowadays freshmen resides in the quantity of notions to be mastered, not the psychological impact of the dissection procedure. Analysis of basic physical fitness standards and the skills required to attain them has lead to formulating main objectives for an 'academic fitness' concept. Conclusion: Academic fitness in

anatomy refers to performing well in any given learning environment, and has always benefited from human corpse dissection.

EMBODIED ONTOLOGIES: HOW ANATOMICAL DATA CAN BE TRANSFORMED INTO 3D PRINTED MODELS VIA THE SEMANTIC WEB

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Introduction: This presentation is an account of the development of 3D human anatomy visualisation techniques since the advent of informatics in the 1960s, showing how 3D printing has revolutionised morphological sciences education vis-à-vis the advancing language of the semantic web. The author aims to show that the potential for anatomists to participate in discovery has been reignited through the interdisciplinary research made possible by ontological artefacts, themselves models of anatomy. Material & methods: The author has researched key factors shaping the modernisation of model making through the decades leading up to the digital age. The presentation continues as a qualitative project investigating the emergence of informatics as the instructive force dictating the development of visualization, education, and advancement in the life sciences, particularly morphology. The key points are illustrated through the author's process of discovering open-source datasets containing arrays of human anatomy units modeled from a variation of the Visible Human project. The author 3D printed several of these anatomical structures, showing how the medium of 3D printing is suitable for making models of anatomy for educational purposes. Results: Through the production of actual 3D printed models of human anatomy iterations, the author demonstrates the role of the Foundational Model of Anatomy ontology in contemporary morphology education. Conclusion: The medium of 3D printing is expansive in its potential as an educational tool for understanding complex ontological relationships, such as those found in anatomy; made even more exciting with the advent of open-source datasets freely available online.

TECHNOLOGY ENHANCED LEARNING IN THE ANATOMY LABORATORY

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To explore potential uses of technology in the Anatomical Sciences Laboratory (ASL) several methods were implemented in order to create a supportive, flexible, personalised and effective learning environment. A total of 636 first year University of Southampton medical students over past 3 years had the opportunity to learn anatomy during Respiratory, Cardiovascular and Renal module. Hardware such as iPads, touch-screen computers, video cameras and large displays in the ASL were introduced together with learning materials such as an online workbook, video casts, quizzes and narrated lectures. Students' thoughts on their use of technology in the anatomy lab was surveyed and an analysis of online resources usage was performed. Statistical analysis of exams results and students' attendance before and after intervention was conducted. 97% of students agreed that use of the technology helped them in their anatomy studies. Use of online materials showed similar pattern of usage between different years with peak at the beginning of the course and just before exams and average number of 190 visits per day. Students liked to watch videocasts and narrated lectures. In the wet anatomy lab environment 98% of students preferred to use a hard copy of the anatomy workbook compared to the electronic version. There was no significant difference in exam results before and after intervention but attendance significantly increased. While an improvement in the quality of learning was proven there was a little evidence to suggest that technology enhanced learning directly influences exam results.

ANATOMY LEARNING COMICS FOR THE INTERESTED LAYPEOPLE AND STUDENTS

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The laypeople who are interested in their health as well as the students who are going to take the anatomy course are recommended to know anatomy at basic level. For them, the comics might be an optimum educational media, thanks to its familiarity and simplicity. However, existing comics, drawn by cartoonists ignorant of anatomy, are not proper for the target readers. The objective of this study was to promote the laypeople and students to understand anatomy without other's assistance. Based on the teaching experience for three decades, anatomy comics were elaborated in a simple style. Title of comics was named after two main characters, "Anna & Tommy". The comics, which were arranged by the systems, delivered anatomical knowledge in concise and interesting manner. Because the comics were logical, memorable and comprehensible, its educat-ional effect was expected to be enhanced. Actually the evaluation by the medical students indicated the usefulness of the comics as a learning material. On the authors' homepage (anatomy.co.kr), the comics could be watched online or downloaded to be printed with no charge. Moreover, other entertaining anatomy comic strips (Dr. Anatophil), made by the same team, and complemented the learning comics.

VALUE OF HYBRID SPECT/CT WITH 99MTC-HDP IN MANAGEMENT OF PATIENTS WITH DEGENERATIVE SPINAL DISORDERS

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Introduction: The hybrid SPECT*/CT** with 99mTc-HDP*** has been proven useful for interpreting radionuclide bone scan results in patients with degenerative disease, showing far better specificity than planar imaging or SPECT alone. The examination combines functional and morphological information and provides accurate evaluation of the site of the lesions. This is useful particularly in spinal abnormal-

ities as facet joint disease, frequent source of chronic pain, where results on conventional imaging modalities (MRI****CT/X-rays) are often non-conclusive. Objective: The evaluation of SPECT/CT application in the management of patients with spinal degenerative disorders in the inpatient clinical setting. Patients and Method: SPECT/CT with 99mTc-HDP performed according to standard protocol of Nuclear Medicine Department. Patients were selected from the Department of Neurosurgery, from January 2014 until August 2015. The inclusion criteria were: chronic back or neck pain (>six weeks); patients who have failed conservative management in the primary care setting (analgesia, rest, physiotherapy); MRI/CT/X-rays findings were insufficient to determine further clinical management. The patients with the spinal "red flags", were excluded. Results: Herein we report examples of SPECT/CT findings in selected patients with painful degenerative spinal disorders and point out the possibilities of the exam to detect the specific focal area of pathology in the spine. We describe the impact of SPECT/CT findings on further clinical management (facet joint injection or denervation, medial branch denervation, spinal stabilization, etc.). Conclusion: According to our experience, the hybrid SPECT/CT with 99mTc-HDP is useful adjunct diagnostic tool in a specific subgroup of patients with the spinal degenerative disorders. The examination has potential to detect the source of pain in the majority of indicated patients and therefore facilitate further correct clinical management of the patient. Explanation marks: *Single Photon Emission Tomography, **Computed Tomography, ***Hydroxymethane diphosphonate labelled with 99m Technetium, ****Magnet Resonance Imaging

THE STUDENT'S SURGICAL OLYMPIADS – THE ROLE IN THE EDUCATIONAL TRAJECTORY OF THE STUDENT WHO CHOSE THE SURGICAL PROFILE OF PREPARATION

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In Russia, the Departments of Topographical Anatomy and Operative Surgery play an important role in providing learners with advanced practical surgical skills. Student surgical interest groups prepare learners through surgical competitions, known as "Surgical Olympiads". Surgical Olympiads stimulate student interest in the development of surgical skills before graduation and encourage students to choose surgery as their postgraduate specialty. Traditional department-based surgical interest groups for students in Russian medical schools have proven to be useful tools for student-based selection of specialty training. They also form a nucleus for initiating research activities among undergraduate students. In student scientific interest groups, students have a chance to select their future specialty and begin practical skills training at the age of 19-20 years, rather than 24-25 years of age as in other countries. This arrangement allows students to master practical surgical skills at an earlier, more pliant age, which may result in higher quality surgical training in Russia Many of the participants in these surgical Olympiads have become highly qualified specialists in general surgery, orthopedic surgery, neurosurgery, urology, gynecology, and emergency medicine. The present article emphasizes the role of student interest groups and surgical Olympiads in clinical anatomical and surgical undergraduate training in Russia.

ANTHROPOMETRIC AND MENSTRUAL CHARACTERISTICS OF YOUNG IGBO GIRLS IN SOUTH-EAST, NIGERIA

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Introduction: Information on menstrual characteristics is important for patient education and for clinical evaluation. The aims of this study were to determine the anthropometric and menstrual characteristics of girls of south-eastern Nigeria.Methods: This cross sectional study of five hundred Igbo young girls from five eastern states, aged 9-25 years. Parameters measured include height (H), weight (W) waist circumference (WC), Chest circumference (CC), Hip circumference (HC) biacromial diameter (BAD), biiliac diameter (BID) and BMI. The menstrual characteristics are menarchael age, dysmemorrhea, amenorrhea, oligomenorrhea and others were obtained through questionnaire. Results: Parameters significantly differed across the five eastern states ($p<0.05$). The mean H, W, BMI, WC, CC, HC, BAD and BID of the subjects were 164±6.64 cm, 59.83±10.06 kg, 76.2±7.70 cm, 88.6±7.66 cm, 95.6±9.7 cm, 85.93±7.4 cm and 73.10±9.75 cm respectively. The mean menarcheal age was found to be 13.07±1.69 years; Mean menstrual cycle was 28.46±1.53 days. Mean menstrual bleeding was 4.30±0.96. Conclusion: There is a significant difference in the anthropometric characteristics of females across the five states of the south east Nigeria. The age at menarche varied with state.

IS THERE A DANGER ZONE FOR THE AFFECTION OF THE ACCESSORY NERVE AT ITS ENTRANCE POINT INTO THE POSTERIOR TRIANGLE DURING BIOPSY OF CERVICAL LYMPH NODES?

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Background: The accessory nerve (N XI) can be affected at its entrance into the posterior triangle of the neck during biopsies of cervical lateral lymph nodes. Aim of this study was to evaluate whether there is a danger zone determinable. Materials and Methods: A total of 186 sides on 111 cadavers preserved with Thiel´s method were investigated during three dissection courses (2009/10: 54 sides; 2010/11: 72; 2011/12:60). The exit points of the N XI was measured to the most caudal point of the mastoid process (Distance A; measured only 114 sides); to the sternoclavicular joint (distance B), to the midpoint of

the clavicle (distance C) and to the acromioclavicular joint (distance D). Distances B, C and D were measured on all 186 sides. Results: Distance A showed a mean distance (MD) of 5.1cm (SD ±0,99) with a Minimum of 2,6 and Maximum of 7,5cm, B a MD of 11cm (SD ±1,48; Min 7cm and Max 14,5cm), C a MD of 9,1 cm (SD ±1,24; Min 5cm and Max 13cm) and D a MD of 12,8 (SD ±1,37; Min 8,5cm and Max 16,4cm). Conclusions: There is a danger zone to determine. With the help of ultrasound guidance the nerve should be identified with respect to the measured distances and therefore spared during biopsies.

CORTICAL CORRELATES OF POSTTRAUMATIC STRESS DISORDER

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Introduction: Posttraumatic stress disorder (PTSD) is a chronic state caused by repeated exposure to the life threatening events. It appears after massive catastrophes, such as wars, floods, extensive fire with lethal outcomes, but also brutal family violence. It is characterized by three major groups of symptoms: re – experiencing symptoms (flashbacks, nightmares, frightening thoughts), symptoms of avoidance (emotional numbness) and hyper arousal symptoms (being easily startled). Most of the studies indicate the changes of the hippocampus as the main neuroanatomical correlate for the PTSD. Our aim is to delineate other structures which changes are also indicative for PTSD. Patients and Methods: For this purpose we have analyzed 82 MRI scans of 49 male newly recruited patients and 33 scans of normal individuals for voxel based volumetric analysis. All the results were statistically processed at 95% probability level. Results and Conclusion: Beside mentioned hippocampus, we have got significantly smaller cortical areas in prefrontal cortices on the right side, insula on both hemispheres and the anterior cingulate cortex. Mentioned changes might be responsible for the emotional more than intellectual deterioration in PTSD patients.

VARIATIONS OF BRACHIAL ARTERY ACCUMULATED IN DEPARTMENT OF ANATOMY IN HRADEC KRALOVE

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Seven cadavers from last 17 acquired in our department had either brachioradial artery (BRA) or superficial brachial artery (SBA). The most common variation was BRA. Among mentioned cadavers, it was 3x in unilateral form, 2x bilateral, and in one case the BRA conjoins with a SBA in contralateral arm. BRA left the axillary artery (2 limbs) or the proximal third of brachial artery (6 limbs). In all cases it continued as typical radial artery in forearm while the original stem followed the pattern of the ulnar artery. Recurrent radial artery left out from anomalous stem in 3 limbs, from original stem in 3 limbs as well, two cases were special. In one cadaver, we found bilateral SBA, described as a stem with superficial position to the median nerve with all other features corresponding to normal brachial artery. The most interesting case was the mentioned coincidence of BRA with contralateral SBA. In this case the SBA was accompanied by another deep stem common for circumflex humeral arteries, deep brachial artery, and superior ulnar collateral artery. This stem became thinner within the arm and terminated as a branch entering the triceps brachii. The main (superficial) arterial stem took responsibility for following supply of the limb starting by inferior ulnar collateral artery. Significant incidence of these vascular variations indicates a potential risk of injury if the radial artery is used as a route for catheterization or in case of surgical approach in the arm.

3D-PRINTING MODELS OF COMPLEX CONGENITAL HEART DEFECTS IN PEDIATRIC CARDIOSURGERY

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Introduction: Real 3D-imaging of congenital heart defects with complex anatomy by 3D-printed heart models is an advanced imaging modality in paediatric cardiology/cardiosurgery. 3D-printed heart models derived on MRI or CT data exactly evaluating complex anatomical spational relationships can be very helpful for surgical planning. Methods: Patients with complex congenital cardiovascular anomalies were selected. Data were obtained from CT-angiography in 8 infants. CT images were segmented and Felix-3.0 was used for 1:1 3D model printing. First goal was to evaluate the accuracy of 3D printing by comparison of 3D model size measurements with measurements of segmented model. A Bland-Altman analysis was used for statistical analysis. Second goal was to analyze the impact of 3D heart model for surgical planning in each patient. Results: The Bland-Altman analysis confirmed a high accuracy of 3D heart models printing by significant correlation between 3D-models and segmented CT-images dimensions measurements (-0.56 ± 0.93mm, mean bias ± standard deviation). All cardio surgeons confirmed a high impact of 3D printed heart models for optimal surgical planning. Conclusion: Current FDM printers can produce authentic copies of patient`s cardiovascular system. Each complex congenital heart anomaly was precisely delineated by 3D-heart model. 3D-printed heart models can optimize surgical procedures due to better planning. They may eventually shorten procedural time and patient`s morbidity.

CHANGES OF THE MUCOUS MEMBRANES OF THE LIPS AND THE MOUNTH CORNER AND THE LINKS OF THEIR HEMOMICRO-CIRCULATORY FLOW WITH EXPERIMENTAL STREPTOZOTOCIN-INDUCED DIABETES IN RATS ON THE ULTRASTRUCTURAL LEVEL

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Introduction: In nowadays diabetes mellitus is one of the most common diseases. However, the region of the mouth corner is ill-researched. This study made it possible to obtaine new information about the processes of the pathogenesis and the dynamics structural changes in the tissues on the different levels. Materials and Methods: Male white adult rats (weight 100 – 130gr) were taken. Animals were injected by srtepthozotocine single in a dose 7 mg/100gr. the biological samples (mouth angle and lip) were taken every two 2 weeks (after the control of glucose level in the blood), under thiopental anesthesia. Photographing of the material was carried out using a microscope UEMV – 100K (Ukraine) at an accelerating voltage of 75 kV and the increase in the screen of 2000x Microscope – 124000h. Results: Thus, at the later stages of the pilot course of streptozotocin-diabetes in the new record of epithelial mucosa of the mouth corner and lip we established a significant change in all cell layers. Installed reorganization of epithelial cells is significantly associated with impaired trophic and processes themselves with destabilization of metabolic processes. Damaged adventitial cells and fibroblasts are seen. Ultrastructural study found that the wall of the capillary slightly changed and the gaps are reduced in diameter. Endothelial cells of elongated shape with sharp contours and euchromatine in karyoplasm. Some cytoplasmic regions of endothelial cells have uneven thickness and contain pinocytic vesicles. Part of the organelles is damaged; mitoch-ondria are hypertrophied with signs of enlightenment matrix with a non- significant number of cristae. The basement membrane is rather narrow and relatively thick. In the perivascular spaces, fibroblasts with large nuclei are defined, mitochondria hypertrophic dilated tubules of the granular endoplasmic reticulum, Golgi cisternae and ribosomes. Conclusion: As a result, we can conclude, occurrence of diabetes in the experimental blood capillaries of mucosa of the mouth corner and lip set various processes raising structural rearrangements, mainly capillary. In these anatomic structures at the ultrastructural level, there are capillaries with significantly altered structures of their walls, disorganization processes in the cells of the mucous membranes, the expansion of intercellular spaces as a consequence of damage to the desmosomal connections, change the lumen of the capillary endothelial cells of deconstruction.

MEMORIX ANATOMY – REVOLUTIONARY BOOK WITH UNIQUE EDUCATIONAL SYSTEM WRITTEN MAINLY BY MEDICAL STUDENTS

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Students typically get lost in long, sophisticated, detailed sentences containing specialized medical terms. According to our Students´ Opinions Survey, most students consider these textbooks very difficult for “first reading”, effective studying and revision. This gave us the idea of creating a textbook that is concise, well-arranged and easy-to-learn form: Memorix Anatomy. We consider non-continuous text to be more efficient in the process of studying, memorizing and revising than continuous text. Thus, only the introduction windows contain continuous text serving as chapter overviews. In total, about 15 % of the textbook is written in continuous and 85 % in the non-continuous text. The textbook also contains many tables, charts and schemes serving as useful tools for better memory consolidation. Interesting notes and clinical correlations are highlighted in the middle column, which points out the importance of anatomy in every day clinical practice. In this section you can also find mnemonics that simplify learning and support creative thinking. In collaboration with experts in adult learning (andragogists) original Memorix educational system (MES) has been created and used, including 5 steps of studying: 1. Chapter structure; 2. Study the chapter in detail; 3. Interesting things and clinical notes 4. Schemes and charts; 5. Questions and figures for revision. The goal of Memorix Anatomy is to teach anatomy in a way that will prepare students for their future medical careers, keep them motivated and support memory consolidation so that they can recall their knowledge of anatomy easily.

ANATOMICAL AND IMAGING STUDY OF THE OCULOMOTOR SYSTEM

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Aim: The aim of the study was to investigate normal anatomical patterns of the oculomotor system. In the support of the anatomical examination important additions were made by medical imaging technique conducted at the same levels. Methods: Dissection was carried out on several levels, the necessary approach being adapted to each region of interest. In the first place the skull was removed, after which it was conducted a sagittal dissection of the cephalic extremity, so that can be revealed the medial surfaces of the cerebral hemispheres and the centromedian regions of the diencephalon and brainstem. It was pointed out the content of the cranial fossa and cavernous sinus. The last stage of dissection consisted of the orbital content approach which was made through the roof and medial wall of the orbit. Results and Conclusions: As a result, we identified the courses of the nerves III, IV, VI, along with the adjacent vascular and muscular orbital elements. Moreover it was distinguished their paths through the posterior and middle cranial fossa, the relationship with the dura, together with vascular components of the circle of Willis. The dissection was conducted so that we could also identify the exits of those cranial nerves from the brainstem and from the skull by observing in the same time their intracranial courses. The study highlighted

the relations between vascular and nervous components. The sectioned pieces could be applied also for medical education purposes, making the neuroanatomy of the nerves and arteries easier to learn.

COMPUTATIONAL NEUROANATOMY OF THE DENTATE GYRUS: BIOLOGICALLY REALISTIC MODELS OF DENDRITIC AND SYNAPTIC PLASTICITY IN THE HIPPOCAMPUS

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Computational neuroanatomy aims at creating anatomically and biophysically realistic models of neurons and neuronal networks, thus relating the structure to the function at subcellular, cellular and network level. Hippocampal network excitability and plasticity are regulated by complex interactions between excitatory and inhibitory synaptic activity, intrinsic membrane properties and morphology of neurons. Here we used computer modeling to explore which computational rules are utilized by hippocampal neurons to regulate their dendritic and synaptic changes. Our simulations show that biophysically realistic compartmental models are able to account for experimentally observed synaptic plasticity and activity of dentate granule cells and their synaptic inputs. We predict a specific role for dendritic morphology in the homeostatic maintenance of dentate granule cell function. We present anatomically detailed models of neurons which indicate that changes in dendritic morphology are able to selectively modulate local plasticity at excitatory and inhibitory synapses.

MORPHOMETRIC CHARACTERISTICS OF CHOROID PLEXUS EPITHELIUM IN CASES WITH SIGNIFICANTLY DIFFERENT PRESENCE OF PSAMMOMA BODIES

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Introduction: Apart from choroid plexus, psammoma bodies have never been observed in any other organ as aging change. Conversely, they were observed in some tumors. The aim of this research was to evaluate some structural characteristics of psammoma bodies, and to connect the intensity of their presence in choroid plexus with the degree of atrophy of choroid epithelial cells. Material & Methods: Tissue samples of the choroid plexus of 30 cadavers' right lateral ventricles were processed, embedded in paraffin, stained with trichrome technique, polyclonal S100 and monoclonal S100 A8/A9 antibodies. Stained sections were afterwards morphometrically analyzed. Results: Morphometric and subsequent cluster analysis showed the presence of two groups with significantly different number of psammoma bodies and degree of epithelial atrophy. The first group included the cases with sparse psammoma bodies and mild epithlelial atrophy characterized by dome cells and cytoplasmic vacuoles presence. The second group included the cases with numerous psammoma bodies, frequent cystic formations and severe epithelial atrophy characterized by epithelial flattening. Psammoma bodies and choroid plexus stroma were immunopositive for polyclonal S100 antibody. Their less intense immunoreactivity was seen for S100 A8/A9 monoclonal antibody. Significant number of S100 A8/A9 immunopositive cells was detected in blood vessels and stroma of the cases with S100 A8/A9 psammoma bodies' immunopositivity. Conclusions: So, the presence of numerous psammoma bodies' might be associated with more severe atrophy of choroid epithelial cells. Psammoma bodies' were S100 immunopositive. Choroid plexus stroma of the cases with S100 A8/A9 immunopositive psammoma bodies' contained significant number of the cells of monocyte-macrophage linage.

TRUNCUS PROFUNDOCIRCUMFLEXUS

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Introduction: Truncus profundocircumflexus is a variation of the branches from the arteria axillaris et brachialis. It concerns the arteria circumflexa humeri poste.rior branching not usually from the third segment of the arteria axillaris and entering the foramen humerotricipitale (accompanying the nervus axillaris), but a variant branching together with the arteria profunda brachii from the proximal segment of the arteria brachialis (as a short trunk) and then passing below the fused insertional tendons of musculus teres major et latisimus dorsi to ascend to its usual filed of supply. Material and Methods: Three hundred seventy two specimens of cadaverous material (Middle-European population, Caucasian race, both sexes) fixed with formaldehyde were dissected. Results: Forty seven cases of above mentioned variant were found and classified in two types. They differed in a number of branches given from the trunk. The total incidence was 12.6% of cases and the term "truncus profundo-circumflexus" was proposed. Conclusion: This rather frequent variant of the arteria circumflexa humeri posterior should be kept on mind when treating patients with planned shoulder joint surgery or with acute injuries of proximal segment of humerus.

EPONYMS OF WENZEL GRUBER

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This year, we commemorated 125-year-anniversary and last year we commemorated 200-year-aniversary of Wenzel Leopold Gruber (1814–1890) birth and death, respectively. He is considered as founder of anatomy at the medical academy in St. Petersburg. He was born in 1814 near to Pilsen in Bohemia (former Austrian-Hungarian monarchy, now Czech Republic), worked as prosector of normal anatomy at the University of Prague in 1842-1847. In 1846 (invited by Pirogov), he became first prosector for normal, practical, and pathological anatomy at the medical academy in St. Petersburg (Russia) where he spent all

his further active life. He died in 1890 e in Vienna (Austria). He belongs to one of the most active anatomists (almost 500 scientific works). We can find 7 different eponymous terms and we can conclude that only 2 of them is actively applied in current science: Martin-Gruber's anastomosis (motor anastomosis between ulnar and median nerves) and os Gruberi (variable bone between first and second metatarsals). Neither of them is a part of Terminologia Anatomica.

RARE VARIANT OF THE UPPER EXTREMITY ARTERIES – ARTERIA BRACHIOMEDIANA SUPERFICIALIS

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Introduction: The arteria brachiomediana and arteria brachiomediana superficialis are very rare variants of the upper extremity arteries, found and reported only accidently. But some reports mix them with similar variants which should be corrected and is the aim of this contribution. Method and Materials: The detailed review of Pubmed and Medline as well as many relevant atlases and contributions on variant anatomy were consulted to gather "all" reported variants. Results: The arteria brachiomediana has never been reported and it was theoretically proposed by Rodríguez-Niedenführ. The arteria brachiomediana superficialis was reported in approximately 20 case-reports, usually unilateral. The incidence based on a meta-analysis of to our knowledge found studies is less than 0.5% of cases. Conclusion: This arterial variant can cause problems during the catheterization via the arteria radialis or ulnar artery; harvesting the vascular pedicle for a forearm flap based on the main arterial trunks; the surgery of the carpal tunnel syndrome or an injury of the superficially located artery. Supported by Charles University, Project PRVOUK # 33.

ANALYSIS OF SURGICAL INTERVENTIONS PERFORMED AT THE UKRAINIAN HOSPITAL

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Introduction. The percent of the patients requiring surgical treatment has increased globally. Urological diseases constitute large part of the surgical interventions. The aim of the study was to describe surgical interventions conducted at Truskavets hospital, located in the famous spa town in Western Ukraine. Methods. We conducted a retrospective analysis of 325 medical records of the patients who underwent scheduled invasive surgeries at Truskavets municipal hospital between January – May 2015. Results. The descriptive analysis found that 208 of the patients were males (64%) and 117 (36%) were females.The mean age of the patients was 52.4 (range 18 – 93). Of them, 154 were operated in urological department and 171 in general surgery. Endovascular laser coagulation of lower extremities was the most frequent operation (15.1%); most of the cases (26.6%) were among women 35-55 years of age. The next most spread was laporoscopic cholecystectomy (14.7%); 25% of the cases were represented by women aged 35-55. Herniotomy was performed in 11.8% of cases, of which 36.8% represented women of 35-55 years of age. Over 47% of men aged 36-60 and 31.6% women aged 35-55 underwent contact ureterolithotripsy (6.4% of all cases).Nephrolithotripsy (7.3% of all cases) was dominant among males 36-60 (58.8%). Conclusion. The largest risk groups for surgical interventions constitute men and women aged 36-60 and 35-55, respectively. Further research, to identify risk factors of major diseases requiring surgical interventions, is warrant.

CHANGES IN ANTIOXIDANT SYSTEM AND LIPID PEROXIDATION AFTER ADMINISTRATION OF NALBUPHINE IN RATS

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Introduction: In previous research projects the pathological changes in the rats' internal organs, as well as blood biochemical parameter changes because of nalbuphine administration were found. But the mechanism of these changes is ill-researched. One of issues of this can be the changes in the antioxidant system provoked by nalbuphine. Thus, the aim of current project was to research the enzymatic component of the antioxidant system and intensity of lipid peroxidation (LPO) in the internal organs of rats after nalbuphine administration. Materials and Methods: Male white rats (weight 190-220 gr) were taken. The animals were injected with opioid "Nalbuphine" every day in a dose 0.9 mg/kg during 3 weeks. After 3 weeks the biological samples (liver, heart and kidneys for histology and biochemical analysis – malonaldehyde (MDO), superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPX), glutathione-S-transferase (GST) were taken after the ether anesthesia. Results: The results are presents in a table. Conclusion: Nalbuphine administration was accompanied by well-expressed changes in peroxide-utilizing system. The changes were found in all samples, but the pattern of these changes is differ in different organs.

INCREASING STUDENTS'MOTIVATION IN PROBLEM-BASED LEARNING CURRICULUM

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Introduction: In 2007 the Faculty of Medicine of the Lithuanian University of Health Sciences introduced the problem-based learning (PBL) curriculum into its preclinical medical program. The implementation and change of curriculum from subject-based to the PBL approach was not without any challenges in the teaching as well as learning in morphological science, especially considering the students, who are unable to cope with this type of self-directed learning. The motivation of students to learn histology during laboratory practice seemed inadequate. It is known that the motivation may be highly influenced by the fear of not knowing in a clinical setting or during a test. Methods: Short-type answer tests of 5-8 questions with or without a practical task were given to the medical students of the second and the third years of studies

during the last histology laboratory work of the particular module. Results: The motivation to study morphology during the laboratory practice of histology increased, and the results of the histology subject part in the module examinations improved. The general satisfaction of the students was also better. Conclusion: The intermediate check-ups not only improve the motivation and general performance of the students, but also give a chance to provide a minor feed-back to the learner.

PARTICLE SIZE DEPENDENT TERATOGENICITY EFFECT OF SILVER NANOPARTICLES IN MICE

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Introduction: Nano particles because of their unique properties have widespread application in bio medicine and many industrial sectors. AgNPs on embryo-fetal development are still under experimental level. Material: The present study was undertaken to determine the potential effects of AgNPs of different size on pregnant dams and fetal development after maternal exposure on gestational days (GD) 6–19 in mice. Methods: AgNPs, of 1300nm and 20nm respectively, were administered to pregnant mice by oral gavages at concentrations of 0.5mg/kg/day and 1 mg/kg/day. All dams were subjected to Cesarean section on GD 20. The fetuses were evaluated for signs of embryotoxic and teratogenic effects. Results: Treatment with AgNPs caused a decrease in catalase and glutathione reductase activities at ≥ 0. 5□mg/kg/day and a reduction in glutathione content at 1 mg/kg/day in maternal liver tissues. However, no treatment-related deaths or clinical signs were observed in any of the animals treated with AgNPs. No treatment-related differences in maternal body weight, food consumption, gross findings. Fetal liver tissue showed significant decrease in catalase and glutathione reductase activities. Histomorphological alterations in the fetal liver were observed at 1300nm particle group which were exacerbated in 20 nm group. Conclusion: The results show that a repeated oral dose of AgNPs during pregnancy caused oxidative stress in fetal hepatic tissue which is not only dose dependent but also depends on the particle size.

ANATOMICAL JUSTIFICATION OF MECHANICAL CHARACTERISTICS OF THE HUMAN FOOT

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The longitudinal and transverse flatness presenting both as an independent characteristic and in combination with other static deformities of the foot is one of the most common orthopedic diseases. This deformation is still the cause of many serious diseases of the musculoskeletal system, often resulting in disability. The mechanical characteristics of the feet of 175 healthy (without any pathology of musculoskeletal system) young men and 315 young women of the Volgograd state medical university at the age from 17 to 21 years old were observed. The research purpose was to acquire data about the resilient characteristics of the foot under the natural conditions at young persons of both sexes. The examination of the morphofunctional condition of the foot was carried out by means of the computerized plantography, involving the systemic analysis and graphical analytical interpretation of the digital image of the foot. Resilience coefficient, deformation coefficient, Young's module and Poisson's coefficient were calculated in both groups. The proposed computerized diagnostic module and the computerized detection of morphofunctional parameters allow to carry out an assessment of the human foot elasticity. The foot indicators (resilience coefficient, deformation coefficient, Young's modulus and Poisson's coefficient) characterize its amortisation function and ability to resist the action of loadings. Thus, a sexual differentiation of specific resilient characteristics of the foot in youth is identified. The developed method can be used for the investigation of elastic properties of the human foot in various age groups, sports specializations, and in patients with various foot diseases.

LEFT VENTRICULAR NONCOMPACTION CARDIOMYOPATHY

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Left ventricular noncompaction cardiomyopathy (LVNC) is considered as "unclassified" cardiomyopathy with relatively rare occurrence. This disease causes, that the myocardium of the left ventricle has a typical two-layer appearance with a thicker noncompacted and thinner compacted layer. It represents an arrest in the normal process of myocardial compaction, resulting in persistence of multiple prominent ventricular trabeculations and deep intertrabecular recesses. The most severe clinical symptoms of left ventricular noncompaction are progressive heart failure, supraventricular, ventricular arrhythmias with ventricular tachycardia or fibrillation, thromboembolic events or sudden cardiac death. The diagnosis of left ventricular noncompaction cardiomyopathy could be established by using imaging modalities such as MRI, CT or echocardiography.

STUDENT AND INSTRUCTOR EVALUATION OF AN ONLINE SYSTEMIC HUMAN ANATOMY COURSE WITH LABORATORY: FLEXIBILITY OF ONLINE LEARNING IS VALUED WHILE STUDENT-TEACHER COMMUNICATION MUST IMPROVE

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An online section of an undergraduate face-to-face (F2F) systemic human anatomy course with a prosection laboratory commenced in 2012-13.

Lectures for F2F students were broadcast in live and archived format to online students using Blackboard Collaborate virtual classroom software. Laboratories were delivered online by a teaching assistant (TA) who manipulated 3-dimensional computer models (from Netter's 3D Interactive Anatomy) in the virtual classroom. The course was studied for two years to assess the impact of delivery format on anatomy grades and reveal student and instructor perceptions of learning/teaching online to formulate future course modifications. Student performance measures (multiple choice term tests and short answer laboratory tests) were statistically identical between the sections (Mann-Whitney U, $p < 0.001$) and there were strong, positive correlations ($r > 0.63$, $p < 0.01$) between incoming grade average and final anatomy grade in both sections. These data suggest that prior academic performance, and not delivery format, predicted anatomy grades. A mixed-methods approach was taken to assess perceptions of the online learning environment through qualitative individual interviews (20 online, 20 F2F; 9 instructors) and quantitative surveys (101 online, 543 F2F). While students valued pace control, schedule and location flexibility of archived lessons, they preferred the unique-hands on experience of the prosections. Instructors and teachers concluded that the F2F environment was more conducive to student-teacher communication and engagement. A smaller student:teacher ratio and frequent formative student feedback to instructors may improve communication in future years.

FINDINGS OF RESEARCH INTO MORPHOLOGY OF HUMAN FETAL HEART

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The staff of the Human Anatomy Department at the Ural State Medical University conducted comprehensive research into heart morphology on 413 specimens (human fetuses) with systematic processing of the findings. They studied the morphometric characteristics of the heart, the structure of the fibrous rings and triangles, the portions of the interventricular septum (IVS), individual and developmental (age-specific) variation in the topography and structure of the atrioventricular node, the AV bundle and its branches, the sources of their blood supply, the direction of the venous drainage. It was established that the structural organization of the cardiac ventricles is based on the conformal symmetry principle. The stages of development of the myocardial connective framework were identified. By the time of birth, the process of formation of the fibrous rings and triangles has not finished yet. Each of variations of the ventricle structure corresponds to a set of particular characteristics of the cardiac conduction system (CCS) portions, implying the change in their position angles, linear dimensions and shape. The sinus portion of the IVS and the AV node form a correlative pair. The blood supply to the portions of the AV section of the CCS corresponds to their structure and development, which, in their turn, manifest individual peculiarities of the interventricular septum structural organization. The venous drainage from the CCS is closely connected with development of the cardiac veins in general.

MINIMALLY INVASIVE APPROACH TO THE ILIAC CREST – FUNCTIONAL AND AESTHETIC OUTCOME

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In hand surgery numerous free vascular bone grafts for treatment of scaphoid nonunion complicated by avascular necrosis have been described with generally similar favourable outcomes. Therefore careful selection of the harvesting site with regard to donor site morbidity is crucial. The aim of this retrospective study was to describe and evaluate our minimally invasive approach to the iliac crest, with special emphasis on the functional and aesthetic outcome. Two observers investigated the scars of 17 patients with a novel translated German version of the Patient and Observer Scar Assessment Scale (POSAS). Postoperative complications were investigated in patient files. The internal consistency of the POSAS (Cronbach's $\alpha = 0.86$ and 0.83 respectively) and Inter-rater reliability of the observer scale were strong ($r = 0.85$, $p < 0.001$). Even a single observer evaluated the scars reliably ($r = 0.74$, $p < 0.001$). Median result in the POSAS overall was 15 (numerical score, 10 = normal skin, 70 = worst scar imaginable). We found no impact on range of motion, postoperative infections, postoperative haematoma or impairment of the lateral femoral cutaneous nerve. During our investigation the POSAS turned out to be a reliable and feasibly clinical tool for linear scar evaluation. We suggest a first evaluation of alternative approaches with similar methods, particularly with the POSAS, to substantiate the choice of donor sites. Consequently we consider the minimally invasive approach to the iliac crest a viable and low-risk option to harvest a vascularized bone graft with excellent patient satisfaction.

ANATOMICAL VARIATIONS OF THE FRONTAL SINUS AND ITS RELATIONSHIP WITH THE ORBITAL CAVITY

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Introduction: The frontal sinus size and contacts with the orbit are extremely variable. We investigated the relationship between the sinus height and its interaction with the orbital wall/roof. Material and Methods: Ninety-two skulls (182 sinuses) were analyzed using cone beam computed tomography. Sinuses' categorization was based on the distance between the superior sinus border and the line passing through the top of the orbit (0= border below the line; 1= border 0-1 cm above the line; 2= 1-2 cm above the line; 3= 2-3 cm above the line and 4= >3 cm above the line). We measured the length of the sinus contact with the orbital wall in the coronal and sagittal planes and defined 4 relationships between the sinus and the orbital roof (no pneumatization=NP; pneumatization

only medially=PM; pneumatization anteromedially= PAM; whole roof pneumatized=WRP). Results: The prevalence of sinus types was: 0=7.1%; 1=19.2%; 2=46.7%; 3=25.3%; 4=1.6%. The mean length of sinus contact with the orbital wall by sinus type-by plane was: 0: Coronal=9.3mm Sagittal=4.2mm; 1: Coronal= 15.7mm Sagittal=11.9mm; 2: Coronal=23mm Sagittal= 17mm; 3: Coronal=29.7mm Sagittal=23.9 mm; 4: Coronal=36.8mm Sagittal=34.4mm. The prevalence of orbital roof pneumatization by sinus type was: 0: NP=61.5%, PM=38.5%; 1: NP=2.9%, PM=51.4%, PAM=45.7%; 2: PM=1.2%, PAM=74.1%, WRP=24.7%; 3: PAM=19.6%, WRP=80.4%; 4: WRP=100%. Conclusion: Increasing frontal sinus height is associated with progressively increasing extent of pneumatization and contact with the orbital wall/roof. The present data should help to become aware of numerous anatomical variations in order to improve surgical procedures in the orbital region, frontal sinuses and anterior cranial fossa.

HOW MUCH ANATOMY IS ENOUGH IN MEDICAL EDUCATION?

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Anatomy is a traditional medical discipline which has earned its place in the medical curriculum long time ago. It describes the normal morphology of the human body and the macroscopic observations are generally put in context with the help of histology and embryology to aid the understanding of function. Before the emergence of Problem Based Learning (PBL), there was a general consensus, that without a firm anatomical knowledge, no pathological relations should be taught. Until recently, in many countries the anatomical disciplines occupied a substantial part of basic medical sciences taught in the first two years. However, with the recent boom in the field of molecular sciences the time used for anatomy has substantially been reduced and its importance as a major free-standing subject has been questioned. Even in a PBL environment, anatomy, histology, embryology are essential components, however, the emphasis is on integration and clinical application. Therefore many universities have recently introduced clinical anatomy courses to replace the traditional approach. In the contemporary medical education there are substantial differences between universities, countries or even continents, in the a) Selection of teaching methods (traditional, PBL, or, “mixed”); b) Course length (from 1 semester up to 4 semesters); c) Course content (systemic or clinical approach, separating or including neuroanatomy, histology or embryology). Since there is a great divergence between the methods, it would be advisable to create a “Common General Core Curriculum”. Furthermore, we should stress the importance of cadaver dissections, which will enable the students to integrate professional and disciplinary perspectives.

DISCONNECTION OF VASCULAR COMPONENTS OF CONSTANT CAROTID-BASILAR ANASTOMOSIS ON THE BRAIN BASE

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Variations of constant carotid-basilar anastomosis (CBA) on the brain base are very common, but there are insufficient data about incomplete CBA. This morphological study had aim to adding new facts about angioarchitecture of human adult CBA, by describing and determining the cases with disconnected vascular components of CBA. The analysis was performed on 20 cases (aged 42-87 years) of different cause of death with disconnected vascular components of CBA, selected among 378 human adult cadavers. Measurement of the outer diameter of arteries was performed with ImageJ program. The incidence of disconnected vascular components of CBA was found in 5.29% of cases. Unilateral absence of the posterior communicating artery (PCoA) was discovered in 16 cases (4.23%)—eight (2.12%) on the left and eight (2.12%) on the right side. In 5/8 on the right and 4/8 on the left side there were hypoplastic PCoAs. In three cases with the right PCoA absence, persistent primitive arteries were noted on the left side. Bilateral absence of PCoA was found in two cases (0.6%). An absence of the precommunicating part of the anterior cerebral artery was noted in two cases (0.53%), and for this reason a true absence of the anterior communicating artery was also noted in the same cases. This investigation proved the presence of incomplete CBA independent of age, gender, or cause of death. This rare, asymmetrical type of the CBA configuration on the brain base was associated with persistent primitive vessel in 4/20 cases and one patient with cerebral apoplexy.

THE BLOOD SUPPLY OF THE HUMAN FETAL SCIATIC, TIBIAL, AND COMMON PERONEAL NERVES

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Introduction: Peroneal neuropathy is one of the most common mononeuropathy. The aim was to investigate the arterial supply of the sciatic, tibial, and common peroneal nerves. Material and Methods: Thirty-six lower limbs of 18 human fetuses were studied.The fetuses had been fixed in buffered formalin and the blood vessels injected with barium sulfate. Micro-dissection of the fetal lower extremities was done under 35x magnifying lenses. The sciatic nerves of 10 lower extremities were dissected and excised and radiographed. Results: The extraneural arterial chain of the sciatic nerve was composed of 2–6 arterial branches of the inferior gluteal artery, the medial circumflex femoral artery, the perforating arteries, and the popliteal artery. The extraneural arterial chain of tibial nerve was composed of 2–5 arteries, which were branches of the popliteal, the peroneal, and the posterior tibial arteries. Radiographs showed the presence of complete intraneural arterial chains in the sciatic and tibial nerves, formed by vessels’ anast-omoses. Dissection showed that, in 97.2% of the specimens, the common peroneal nerve was supplied only by one popliteal artery branch, the presence of which was confirmed radiologically. Conclusion: The

sciatic and tibial nerves are supplied by numerous arterial branches of different origins, which provide collateral circulation. In contrast, the common peroneal nerve is most frequently supplied only by one longitudinal blood vessel, a branch of the popliteal artery. Such a vascular arrangement may make the common peroneal nerve less resistant to stretching and compression.

MORPHOLOGICAL AND FUNCTIONAL PROPERTIES OF THE RENAL ARTERY DURING AGING

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The causes of ischemic nephropathy are mainly connected with changes in morphological and consequent functional characteristics of the renal artery. We examined some characteristics of the renal artery performing Doppler ultrasound, morphometric, and histological analysis, and compared them according to age, in effort to establish facts which could lead to a failure of renal function in elderly. Sixty healthy people were included in this study. They were divided into five groups, according to their age. The first group was 20-29 years old, second 30-39...and the fifth group was 60 years and older. A few functional parameters (diameter, peak systolic velocity (PSV), end diastolic velocity (EDV) …) of renal arteries were measured using Doppler ultrasound. The specimens for the morphometric and histological analysis were taken from the beginning part of the left renal artery. They originated from 50 cadavers divided into the three groups. Mean diameters of both renal arteries were significantly lesser in the oldest group. The values of PSV and EDV had very high negative correlation with age. The increase of the absolute area of the intima, as well as its thickness highly correlated with age. Age-related histological changes were observed in all layers of the renal artery wall, but they were more prominent in the intima, internal elastic lamina and media. The diameter of the renal artery significantly decreases with age, which is particularly caused by the widening of the intima, and it reduces blood flow. These changes are faster in older people.

HYPOTHALAMIC INFLAMMATION: THE ROLE IN SOMATIC DISEASES

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Hypothalamus represents accumulation of several homeostats regulating essential functions of the organism. Even if hypothalamus occupies only approximately 2 per cent of the brain volume, alteration of its functions may results in significant disruption of homeostatic regulations accompanied by development of somatic diseases. Altered functions of hypothalamic nuclei caused by chronic pro-inflammatory milieu in the hypothalamus may participate on the development of obesity, hypertension or cachexia. Only recently were described factors participating on development of hypothalamic inflammation and connecting development of obesity and hypertension. Better understanding of etiopathogenesis of hypothalamic inflammation may create basis for development of new therapeutic strategies enabling to treat somatic diseases.

ATYPICAL OLFACTORY NEUROBLASTOMA LOCATED IN MAXILLARY SINUS: A CASE REPORT

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Introduction: We reported a very rare case of olfactory neuroblastoma, also known as esthesioneuroblastoma, which was located in the maxillary sinus. There is still no consensus on the optimal treatment for this neoplasm, and the literature contains only few accounts of endoscopic resection in this and similar atypical cases. Methods and Results: The tumor was removed via endoscopic resection assisted by Caldwell-Luc with navigation. Intensity-modulated radiation therapy was applied postoperatively. A 2 years' follow-up the patient is free of tumor. Conclusions: It must be kept in mind that olfactory neuroblastoma may originate away from the olfactory region and should be included in the differential diagnosis of maxillary masses. Olfactory neuroblastoma is a potentially curable malignancy with surgery and intensity-modulated radiotherapy. Endoscopic techniques result in significant higher quality of life in contrast to conventional surgery.

THYROID FORAMEN

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Introduction: Thyroid foramen is a congenital linear opening located in the lamina of the posterosuperior portion of the thyroid cartilage. Its incidence in adults is ranging 2-57%. The foramen can be crossed by a vessel, nerve, neurovascular bundle, or connective tissue. Material and Methods: Under dissection microscope in 57 larynx specimens, 113 sides (57 left, 56 right) were investigated. After finding the thyroid foramen, its measurements were performed. Results: The thyroid foramen was found 9 sides (5 left, 4 right). It was bilateral in 3 of 57 specimens. The foramen is located 6.7±2.9 mm below the superior tubercle, and at (4 sides) or anterior (5 sides) to the oblique line. Outer measurements (length and width) of the foramen were 2.3±1.0 and 2.2±0.9 mm, respectively. Its inner measurements (length and width) were 3.1±0.9 and 2.4±0.7 mm, respectively. The foramen was crossed by nerve-artery, nerve-artery-vein, artery-vein and nerve-venous plexus. Conclusion: The thyroid foramen was observed in 7.9% sides (9 of 113 sides). It is crossed by a neurovascular structures in all specimens. The foramen should be keep in mind by surgeons to manage local bleeding and to avoid unwanted neural impairment.

RAPID PROTOZYPING AND BIOPRINTING IN TRAUMA AND ORTHOPAEDIC SURGERY

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Usage of emerging technology of rapid prototyping in medicine have been focused also on the development of models for diagnosis, for training and planning surgical, as well as the direct manufacture of implants for bone reconstruction. The applications of 3D printing in the field of medicine are giving extraordinary results and tissue and prosthetic 3D printing, medical and engineering research professionals are conducting about 3D printing organ bind. Researchers worldwide are pursuing the creation of artificial bone using 3D printers, bones that can be later implanted in humans. There already have been developed a systems which prints 3D synthetic bones using a 3D printer to do in materials combining two synthetic polymers that have a similar bone structure behavior. This technology is intended to replace the current methods of graft including bone marrow transplant to other parts of the body, bone marrow transplantation of other individuals, and even the creation of bone substitutes like calcium phosphate, or porous hydroxyapatite scaffolds. Spinal fusion mainly involves the techniques which are designed to mimic normal healing. Custom orthopedic implants, instruments and plastic or metal implant prototypes including advanced trabecular structures are one of the best opportunities that rapid prototyping in today medicine. In the near future, many body parts could be manufactured in a turn, and successfully implanted in patients. Although medical advances in 3D printing are happening almost every day, 4D printing is here. Flat objects made with 3D printing, using regular plastic, combined with smart material were able to become a hub without external intervention. In a nut shell, the future of additive manufacturing in trauma and orthopedic surgery is relatively bright with the inclusion of 3D printing in medicine and bio-printing in this area will be focused on fractures, nonunions, deformities and bone, cartilage and soft tissue reconstruction.

REGENERATIVE MEDICINE – IMPLICATIONS FOR UROLOGICAL PRACTICE

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In past few years, we witness tremendous shift from laboratory engineered tissues for experimental utilization, towards its application to animal models, or even to humans. Mentioned lead in introducing of new medical branch–regenerative medicine, which combine the newest findings from cell research and material engineering with the emerging technology of 3D bio-printing. Recently, this revolutionary approach has entered surgical disciplines, and urology is not left behind. In our presentation, we critically summarize current clinical implications of regenerative medicine and tissue engineering in urology, its results, pitfalls and possible future development. We are focused not only on artificial tissues such as kidney, urinary bladder, urethra, etc. but also on stem cell therapy of urinary incontinence and erectile dysfunction. Supported by the grant of Ministry of Health of the Slovak republic No. 2012/4-UKBA-4 and Grant of the Slovak Research and Development Agency No. 0434/12.

POSTER PRESENTATIONS

PECILIARITIES OF THE LUNG AND LIVER TOPOGRAPHY IN INDIVIDUALS OF THE DIFFERENT CONSTITUTIONAL TYPE

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Introduction: Radial examination methods are widely used in the clinic to diagnose internal organs pathology. The correct interpretation of the results requires not only knowledge of the investigated areas anatomy, but also consideration of the constitutional peculiarities of the examined individuals. Materials and methods: We conducted anthropometric and computer -tomographic examination of 51 persons, 22-63 years-old (22 men, 29 women). Among the examined individuals 12 asthenics, 22 – normosthenics and 17 – hypersthenics were found. The examination was carried out on computer tomograph of the fourth generation TSX-101A Aquilion 16. Results and conclusions: The standard lungs and liver's margins are most relevant in normosthenic. In asthenics – apex of a lung projected at 4sm above the collarbone; the normosthenics – 4,2sm; in hypersthenics – 3.5sm. In asthenics lower margin of the lungs is downcast, and located at the at X-rib level; in hypersthenics – raised to the IX-rib by the mid-clavicular line. The highest point of the upper liver border is on the line with diaphragm height standing; in hypersthenics – projected by mid-clavicular line at the right IV-rib level; in asthenics – at V rib. The lower liver border by the right middle axillary line – projected at the X-rib level in hypersthenics, in asthenics – on the upper border of the XI-rib. The results of our research show, that each of the constitutional body types characterized by certain features of the internal organs topography, that is necessary to pay attention while examining patients at the clinics.

COMPUTER-TOMOGRAPHIC INVESTIGATION OF THE DENSITY OF THE OSSEOUS TISSUE OF THE CERVICAL VERTEBRA IN INDIVIDUALS OF JUVENILE AGE

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Introduction. Density determination of the tissues during the computer tomography plays very important role for differential diagnosis and for prediction of the pathological processes passing. But the practical experience testifies that density verify while examination of the patients on different computer scanners. The aim of our investigation became study of the density of the cervical vertebrae osseous tissue and their correlation in male and female of the juvenile age. Materials and methods. Computer tomograms of the practically healthy people in age from 18 till 25 years were analyzed (12 male, 9 female). Examinations were made according to medical condition (not connected with the vertebral column osseous tissue state) on the computer tomographic scanner of the fourth generation TSX-101A Aquilion 16. During the investigation osseous tissue density of the anterior arch of the atlas and the body of every cervical vertebrae in three areas (on the superior margin, in the central part and on the lower margin) and also of the dens of the second cervical vertebra was measured in the frontal projection with the use of the ordinary computer program K-Pacs-Lite. Results. Analysis of the osseous tissue density of the cervical vertebrae in the individuals of the juvenile age testified significant variability in male and female. But areas of the maximal and minimal density of every vertebra were measured for individuals of every sex – minimal index of the density was on the level of the central area of the vertebrae body and also variants of their correlation were determined.

ANATOMICAL VARIATION OF THE BICEPS BRACHII AND BRACHIALIS MUSCLES INERVATION

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Introduction. A number of variations in the course and distribution of the brachial plexus and its branches have been reported. Material and methods. We performed anatomical dissection of the right upper limb of the male cadaver, for educational purposes. Results. On this specimen the musculocutaneous nerve was not found. The radial nerve has its regular position – arises from the posterior cord of the brachial plexus and descends, accompanied by the arteria profunda brachii across the posterior surface of the humerus, between the lateral and medial head of the triceps brachii muscle. One branch of the radial nerve arises at the lower border of the pectoralis major muscle (upper third of the upper arm) and ends in biceps brachii and brachialis muscles. Other anatomical relations are regular. Conclusion. It is traditionally described that a lateral muscular branches of the radial nerve supply the lateral part of the brachialis muscle, while the musculocutaneous nerve supplies the greater part of the brachialis muscle. Also, the musculocutaneous nerve may be doubled, unusually short, or absent. Our finding is interesting because the musculocutaneous nerve is absent, and all of the upper arm muscles (antagonistic muscle groups) are innervated by the same, radial nerve.

EVALUATION OF THE ACHILLES´TENDON PARAMETERS AND DETECTION OF THE POSSIBLE TENDINOPATHY AMONG ATHLETICS: ULTRASONOGRAPHIC STUDY

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Introduction. The Achilles tendon is the largest and strongest tendon in the body. It is highly susceptible to overuse injury among athletics because of its poor blood supply and the strong forces to which it is subjected. There are certain clinical tests used for diagnosis of Achilles' tendinopathy. However, sometimes the diagnosis is controversial. Nowadays, magnetic resonance imaging (MRI) and ultrasound (US) are the modalities of choice for the diagnosis of Achilles' tendon diseases. US has the privilege over MRI in being cheaper and able to study the tendon in a real-time dynamic mode. Objective. to determine the normal anatomical values of both the anteroposterior and transverse diameters of the Achilles' tendon and to evaluate the possible variations of these diameters in cases of tendinopathy among athletics. Patients and Methods. Ultrasonographic examination was employed to evaluate 100 Achilles tendons. Fifty volunteers Athletics, with suspected Achilles' tendinopathy on one limb (age range 25-50), were selected from the out patients clinic, Departments of Orthopedics and Physical Medicine, Faculty of Medicine, Cairo University Hospital. Tendons were examined in order to measure the tendons thickness in the antero-posterior dimension and width in the transverse dimension. Images were obtained in both transverse and longitudinal planes using a high-frequency PHILIPS linear transducer of at least 10 MHz. The diameters of the Achilles' tendon of the suspected and healthy limbs were recorded and compared. The examination was carried out during rest Results. the transverse diameters of the Achilles' tendons examined ranged between 11.2 and 16.5mm, arithmetic mean 13.7±1.5mm while the anteroposterior diameters studied ranged between 4.2 and 6.7 mm, arithmetic mean 5.3±0.5 mm. Significant increases were noticed in both anteroposterior and transverse diameters of the suspected limbs as compared to the normal ones. Conclusion. There was no statistically significant difference of the Achilles tendon diameters in relation to age in adults. Also, there was a statically significant difference in diameters between limbs with suspected tendinopathy and normal ones. Moreover, ultrasound should be considered as a part of the clinical examination in patients with suspected tendon lesions.

OPHTALMIC ARTERY – DEVELOPMENTAL AND TOPOGRAPHIC ANATOMY

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Ophthalmic artery as a terminal branch of internal carotid artery is an important clutch between extracranial and intracranial riverbeds. It leaves the skull through the superior orbital fissure and supplies the eye and the orbit. Its course and syntopy with other structures is not important only for neurosurgeons in the framework of interventions in the cranial cavity, but also for eye surgeons too. This work deals with developmental aspects, as well as with topography – the course of the artery and its relationship to its surroundings structures. Fifty-two orbits and optic canals (27 left and 25 right) on the cadavers embalmed by formol method were dissected. The ophthalmic arteries were dissected in detail, origins from the internal carotid artery were described and the intracranial and orbital course was described and compared with developmental data. Our results showed that the most frequent origin of the ophthalmic artery was craniomedial, the most frequent location of ophthalmic artery was below the optic nerve, the diameter of the artery is variable and depends on the canal size more than the diameter of the nerve. The knowledge of development and topography is really important for everyday work of clinicians.

THE EFFECT OF NALBUPHINE ON ULTRASTRUCTURAL ORGANISATION OF CAPILLARIES

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Angiopathy remains to be one of the most severe manifestations of the effect of endo- and exogenous factors on the organism. The objective of this study is identification of the ultrastructural features of capillaries under long-term effect of Nalbuphine. The research material: ultrathin sections of the cerebellar cortex, white substance of the telencephalon, eyeball vascular tunic, pancreas and skin of rats. The method of electron microscopy was used. After injection of Nalbuphine during 2-weeks ultrastructural organization of capillaries of the cerebellar cortex, white substance of the telencephalon and the eyeball vascular tunic was considerably damaged. They were dilated, their walls were thinned. There was found edema and a thickening of the basal membrane, though its integrity was preserved. After 4-weeks angiopathy developed in the pancreas and the skin. Electron-dense nuclei of endotheliocytes protruded into the capillaries' lumen. Basal membrane lost its sharp contour. Pericytes occasionally delaminated from it. Plasmolemma formed protrusions into the capillaries' lumen. After 6-weeks of the experiment was observed induration of cytoplasm, decreased of pinocytic folds and vesicles, reduction of organelles. An increased number of lysosomes, hypertrophic mitochondrions and Golgi complex were found in some endotheliocytes. Cytoplasm of endotheliocytes contained numerous precipitates and coagulates, nucleolemma become disin tegrates, karyolysis began. Basal membrane was blurred, fragmented. Thus, injection of Nalbuphine during 6 weeks inflicts a considerable damage on the ultrastructural organization of the capillary bloodstream of various organs. The first to react to the adverse effect of opioid was endothelium of the brain and of the eyeball.

SURFACTANT PROTEINS – AN UPDATE ON FUNCTION AND ACTIVITY

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The lung surface is lined with a complex mixture of phospholipids and proteins known as pulmonary surfactant. It is essential for normal respiratory mechanics and reduces the surface tension of the air-liquid interface and, as a consequence, prevents collapse of the alveoli – a lack of surfactant (and surfactant proteins) leads to respiratory failure. Six different surfactant proteins have been described to date in numerous tissues and humors, named SP-A, -B, -C and -D as well as two recently discovered SP-G and SP-H. The surfactant proteins B, C, H and at least to some extend also G are hydrophobic proteins and essential components during formation of surfactant monolayers and with regard to their physicochemical properties enables them to act as an anchor within phospholipids to reduce the surface tension of biological interfaces and contribute to the adsorption of phospholipids at the air-liquid interface. The surfactant proteins A and D are representatives of the C-type lectin family and in this context part of the innate immune system. By means of their essential and complex properties surfactant proteins are still of high interest with regard to clinical and pharmaceutical investigations.

BRANCHING PATTERN OF AORTIC ARCH: PRELIMINARY STUDY

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Introduction. Embryological development of aortic arch and branches is in fourth and eight week of fetal life. Anatomical variations of aortic arch and branches lead to abnormalities in these developmental period. The anomalous branching pattern of the aortic arch can alter the cerebral haemodynamics, which in turn can lead to cerebral abnormalities. Knowledge the about vessel branching variations is to be critically important to prevent complications during the head and neck or chest region surgery. Also, knowledge of the variations in the classical branches of the aortic arch is important in the diagnosis of intracranial aneurysm after subarachnoid haemorrhage. Methods. This study was conducted on head and carotid angiography MDCT images of a total of 115 patients consisted of 67 male and 48 female who applied to Department of Radiology, Necmettin Erbakan University. Branching pattern of aortich arch were evaluated on insapce images. Seven types of aortic arch were found. We also investigated type incidence of aortic arch whether differences between the sexes.The datas of this study were evaluated by using SPSS 20.0. Results and Conclusion. In 90 cases (78.38 %) aortic arch has the classical branching pattern (Type 1 morphology-normal aortic arch which has three branches-TB, LCC, LS). We observed variational branching in 25 cases (21.7 %). Seven different types of branching of aortic arch were seen. Aortic arch is important for head and neck vascular surgery. We believe that the knowledge of the anatomical variances of aortic arch can also be helpful in surgery processes.

MORPHOMETRIC ANATOMY OF THE ORBIT AND ITS SURGICAL RELEVANCE: PRELIMINARY STUDY

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Objective. The aim of study was to investigate morphometric anatomy of orbit in order to support preoperative evaluation of surgeons for decisions. Material & Methods. This is a preliminary descriptive study performed on 28 skulls from Department of Anatomy and CT scans of 20 patient from Department of Radiology were included to this study. The measurements of the parameters from skulls and CT images were recorded. The parameters were: width and height of orbit, orbital depth and volume, area of orbital aperture, distances between medial and lateral walls of orbit from root of nose. SPSS 11.5 software were used to analyze the data evaluated with Pearson/Spearman correlation. Non-intact or fractured skulls were excluded from measurements of related parameters. Results. The average volume of 46 orbits from 28 skulls was 25.6 ml. The width of 52 orbits had a mean of 38.64 mm and average orbital height of 55 orbits was 35.37. The mean area of 48 orbital apertures was 6.936 cm2. In addition, 40 orbital CT images from 20 patients had the width average of 38.05 mm and height average of 35.54 mm. The correlations of six parameters including the volumes, areas and lengths were found statistically significant ($p<0.05$). Orbital volume had strong correlation with area of orbital aperture and width and height of orbit ($p<0.001$). Furthermore the significant correlations of area of orbital aperture with width and height of orbit were determined from measurements ($p<0.001$). Conclusion. Due to the strong relationship between orbital volume with area of orbital aperture and width and height of orbit, from morphometric parameters that easily can be measured it may be possible to predict orbital volume, which is an essential information for surgery. Preoperative evaluation of orbital morphology in terms of volume, width and height in some cases importantly contribute to surgical decisions

RX DEFECOGRAPHY AND OBSTRUCTED DEFECATION SYNDROME: A RETROSPECTIVE STUDY

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Introduction. Constipation is a very common symptom, affecting approximately 15% of the general population worldwide. Severe constipation may occur in the Obstructed Defecation syndrome (OSD) following the inability to expel the fecal bolus. Several findings I can be found in OSD, including rectocele, rectal prolapse, perineum spastic, and enterocele; they can be

detected clinically and/or radiologically (e.g. Rx defecography, defeco-MRI, and 3D perineal ultrasound). Aim of the study was to evaluate retrospectively OSD patients who underwent Rx defecography from January 2006 to June 2015 in a tertiary university hospital located in Sassari, Italy. Materials and methods. It was carried out an observational retrospective study to assess the radiological findings detected in patients who were prescribed Rx defecography for a suspected OSD. All the confirmed OSD individuals were enrolled. An ad-hoc e-form was prepared to collect the main epidemiological, clinical, and radiological variables. Results: 320 patients were selected. The mean (SD) age was 48 (2,5) years. 260/60 (81%) were females. The most prevalent radiological findings were: anterior rectocele (280, 87%) and internal mucosal prolapse (295, 92%), enterocele (112, 35%). 89% showed at least two pathological findings. Conclusion. The study performed in our centre demonstrated that Rx defecography can be helpful to diagnose OSD; several radiological findings can favor the confirmation of clinically suspected syndrome. The main advantages of this technique, represented by its low costs and the low ionizing radiation dose, can allow its implementation even in low-income countries

VARIATIONS OF THE RENAL AND TESTICULAR ARTERIES

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Introduction. Anatomical variations of the origin and topography of abdominal blood vessels are very common and well described in the current literature. Among vascular variations, the gonadal arteries show frequent variations (accessory testicular artery, testicular artery which originates from multiple renal arteries, double renal and testicular arteries etc.). Material and methods. During dissection of the male specimen we found renal and testicular arteries variations. Results. In one specimen we found variant position of the left testicular artery and variant origin of the right testicular artery along with double right renal arteries. The left testicular artery arises from the abdominal aorta, ascends behind the left renal vein and crosses over the left renal vein. On the right side, two renal arteries were found. Higher renal artery has regular position, while lower renal artery has smaller diameter (caliber) and behind vena cava inferior, testicular artery arises from it. Conclusion. The left testicular artery is crossing over the left renal vain, which could be considered in cases of clinical symptoms that correspond to "nutcracker" syndrome (compression of the left renal vein between the aorta and superior mesenteric artery). We think that described anatomical variation of the left testicular artery could be related to symptoms such are: obstruction of left renal vein outflow, venous hypertension with the gonadal vein stasis, varicocele, pelvic venous congestion, dyspareunia, dysuria, dysmenorrhea and left flank pain with radiation to the left gluteal region. Described anatomical variations should be considered in medical practice, especially during diagnostic and surgical procedures.

OLIVE LEAF POLYPHENOLS ATTENUATE OXIDATIVE STRESS IN RAT SKELETAL MUSCLE AFTER STREPTOZOTOCIN-INDUCED TYPE 1 DIABETES

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Introduction. Hyperglycemia resulting from uncontrolled glucose regulation is widely recognized as the causal link between diabetes and diabetic complications, as well as increased oxidative stress that could affect the function of skeletal muscle. Skeletal muscle possesses a well-developed system to regulate reactive oxygen species (ROS) and prevent potentially deleterious effects including both mitochondrial and cytosolic isoforms of superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPx) enzymes, and a number of direct scavengers of ROS. The goal of this study was to investigate the effect of olive leaf polyphenols on hyperglycemia-induced ROS generation in skeletal muscle of diabetic rats. Materials and methods. Diabetes was induced by a single administration of streptozotocin (SZT) in male Wistar rats. The blood glucose was monitored at set time intervals. Well characterized olive leaf polyphenols (OLPs) were i.p. administrated during seven days after SZT-induced diabetes. Total antioxidant capacity (TAC), CAT, SOD, GPX and total protein thiols (TPT) were determined in rat muscle. Results. PFEs treatment markedly increased TAC and SOD activity in skeletal muscle soleus of OLPs treated rats compared with SZT rats. Cytosolic GPx and CAT activity in muscle were increased, as well as the amount of TPT. However, the highest level of TAC and the highest activity SOD were found in the mitochondrial fraction. Conclusions. Treatment with OLPs for 7 days in diabetic rats stimulated activity of CAT and reduced the level of cellular ROS. This study suggested that polyphenols act through a redox-modulating mechanism rather than through direct free radical scavenging.

MITOCHONDRIA OF CARDIOMYOCYTES OF RAT HEART IN EXPERIMENTAL DIABETES – MORPHOLOGICAL CHARACTERISTICS

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Introduction: In the previous study of the rats' myocardial hemomicrocirculatory bedlinks the microcirculatory disorders, provoked by diabetus mellitus were found, and destructive changes histohematogenous barrier and myocardiodystrophy formation. Because of this we decided to research the changes in the cardiomyocytes mitochondrial apparatus in the experiment. Materials and methods: The research was carried on 45 rats – males weighing 100 – 130g. The control group was formed from intact animals of the appropriate age. The insulin-dependent form of the experimental streptozotocin-induced diabetes in rats (single 7mg / 100g). The development of diabetes was monitored during 90 days. The animals were taken every 2 weeks after the thiopental anesthesia. The electron microscopy pictures were made and the

ImageG v.1.48 software were used for mitochondria measurement. Results: Morphologically mitohondrial change shape, dense contact between mitochondria, mitochondrial christs lost clarity. Mitochondria diameter (mean±sem, CV–coefficient of variation): control group 2,37±0,07 μm, CV 0,32; 2-d week 3,19±0,11 μm, CV 0,34; 4-th w. 2,42±0,09 μm, CV 0,38; 6-th w. 2,51±0,09 μm, CV 0,34; 8-th w. 3,17±0,13 μm, CV 0,4, 10-th w. 3,21 ±0,11 μm, CV 0,4. Conclusion: The comparative analyze of mitochondrial apparatus in cardiomyocytes of rats was provided during this experiment and changes of mitochondria diameters and structure, as well as wall thickness, depending on the duration of the experiment were found.

DEPLETION OF NEURAL STEM CELLS FROM THE SUB-VENTRICULAR ZONE OF ADULT MOUSE BRAIN USING CYTARABINE

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Neural stem cells (NSCs) reside along the ventricular axis of the mammalian brain. They divide infrequently to maintain themselves and the down-stream progenitors. Due to the quiescent property of NSCs, attempts to deplete these cells using anti-mitotic agents such as cytosine b-Aarabinofuranoside (Ara-C) have not been successful. We hypothesized that implementing infusion gaps in Ara-C kill paradigms would recruit the quiescent NSCs and subsequently eliminate them from their niches in the sub-ventricular zone (SVZ). We infused the right lateral ventricle of adult mice brain with 2% Ara-C using four different paradigms: 1- one-week, 2- two-weeks, 3,4- two-weeks with an infusion gap of 6 and 12 hours on day seven. Neurosphere formation dramatically decreased in all paradigms immediately after Ara-C infusion. Reduction in neurosphere formation was more pronounced in the 3rd and 4th paradigms. Interestingly one week after Ara-C infusion, neurosphere formation recovered towards control values implying the presence of NSCs in the harvested SVZ tissue. Unexpectedly, neural colony forming cell assay (N-CFCA) in the 3rd paradigm, as one of the most effective paradigms, did not result in formation of NSC-derived colonies (colonies >2 mm) even from SVZs harvested one week after completion of Ara-C infusion. However, formation of big colonies with serial passaging capability, again confirmed the presence of NSCs. Overall, these data suggest Ara-C kill paradigms with infusion gaps deplete NSCs in the SVZ more efficiently but the niches would repopulate even after the most vigorous kill paradigm used in this study.

PERCEPTION OF FIRST YEAR MEDICAL STUDENTS IN RELATION WITH THE CADAVER AND THE DISSECTION ROOM

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Students' point of view and experiences in the dissection room are useful as perspective for planning a body donation program. Our objective was to evaluate the importance attributed to the body and the reaction caused by the cadaver and the environment on students (as promoters of change). We surveyed 125 first year medical students at the Gross Anatomy course 2014. Survey included 24 questions and some of them admitted more than one answer. Students mean age was 20 and most of them were female (61%). Sixty seven per cent had never had previous contact with a cadaver, but they considered Anatomy important for their career (97.6%) and cadaver important to learn Anatomy (98.4%). Symptoms more often related with the first contact where eye irritation, rhinitis and unpleasant odor, instead 27% had none. Prevalent emotions were enthusiasm and surprise, but 46% considered none or indifference. Symptoms and emotions did not significantly modify during the course. Main causes were the corpse and dissection laboratory smell associated to formaldehyde. Focusing on the topic, consider the body as an object and humor contributed to overcome these manifestations. As dissection is not possible for students during the course, 83% considered they should and 59% were interested in being student assistants to dissect. Most of them declared they should donate their organs for transplantation but only 26% should donate their own body for teaching and research. Instead a hard work is necessary we consider the background is positive to afford the challenge of a donation program.

DETECTION OF SURVIVIN IN THE SKIN OF MALE ALBINO RATS AT DIFFERENT AGES: HISTOLOGICAL AND IMMUNOHISTOCHEMICAL STUDY

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Introduction: The epidermis is a self-renewing stratified squamous epithelium that forms the outer most component of the skin. A balance between epidermal cell proliferation, differentiation and apoptosis preserve epidermal homeostasis. A potential inhibitor of apoptosis has been recently identified as survivin. This study was designed to detect the presence of survivin in normal skin of male rats at different stages of postnatal development. Materials and Methods: This study included 30 male albino rats equally classified, according to their ages, into 6 groups: zero, five, ten, fifteen, twenty and sixty day- old. Skin specimens were obtained from the back of all animals, processed, sectioned and submitted to H&E and immuno-histochemical staining for survivin. The area percent and the optical density of survivin in the epidermis, dermis and hair follicles were detected using image analyzer and were statistically analyzed. Results: Survivin immunopositivity was detected mainly in the nuclei of basal as well as prickle and granular cell layers of epidermis. In the dermis, survivin immuno-staining was seen in the fibroblasts, cells of sebaceous glands as well as in the germinal, inner root sheath and outer root sheath of hair follicles. The area percent of survivin in both epidermis and dermis was higher at young ages then gradually decreased towards adulthood with a second rise demonstrated at age of sixty days. Conclusion: Survivin exists in normal skin at

different stages of postnatal development. Its existence is greatly confined to cells involved in mitosis. Thus, its anti-apoptotic role seems to be connected to the highly proliferating cells. Understanding the role of survivin in the skin would help to approach new strategies in prevention and therapeutics of skin cancer & other skin inflammatory diseases

THE EFFECT OF ACUTE KIDNEY INJURY (AKI) ON THE LIVER AND SMALL INTESTINE HISTOLOGY IN MALE ADULT ALBINO RATS AND THE IMPACT OF ADMINISTRATION OF BONE MARROW-DERIVED MESENCHYMAL STEM CELLS (BM-MSCS)

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Introduction: Acute kidney injury (AKI) patients often manifest with extra-renal organ affection. In this study, we aimed at exploring the extent of such effects on the liver and small intestine and the potential therapeutic effect of BM-MSCs. Materials and methods: Forty two rats were subjected to left kidney unilateral nephrectomy. Half of the rats received a single IV injection of BM-MSCs and the remaining half continued without treatment. All animals were sacrificed at 5, 24 and 72 hours after the operation and samples were obtained to detect the serum level of urea, creatinine, AST and ALT. Liver and small intestine sections were stained by H&E, PAS and caspase-3. Morphometric measurements of optical density of PAS positive reaction and mean area percent of positive caspase-3 immunostain were done and data obtained were statistically analyzed. Results: Kidney and liver function tests were markedly elevated in all nephrectomy groups; on the other hand they declined in all BM-MSCs treated nephrectomy groups to normal range. In liver H&E stained sections, nephrectomy groups showed congestion and dilatation of blood sinusoids. In small intestine sections, there was inflammatory cellular infiltration and blunting of villi. Such changes were ameliorated in stem cells groups.The mean grey of optical density of PAS positive reaction showed statistically increase in nephrectomy subgroups after 24 and 72 hours in liver and after 72 hours in the intestine. In caspase-3 immunostained sections the mean area of caspase positive cells was statistically increased in all nephrectomy subgroups in liver and small intestine compared to control group. Conclusion: AKI is not an isolated illness and it causes distant organ injury to the liver and small intestine. In addition, BM-MSCs should be considered as a possible therapeutic strategy for the treatment of AKI effects

RETINAL ARTERIAL TORTUOSITY: A COMPARISON BETWEEN HYPERTENSIVE AND HEALTHY FUNDUS

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Introduction: Retinal vascular architecture has been the hotspot of numerous clinical researches. This study compared the retinal arterial tortuosity among healthy and hypertensive subjects and probed into any existing association between tortuosity and microcirculatory perfusion status of hypertensive retinopathy. Materials and Methods: Fundus images (N=430; 200 Healthy; 230 Hypertensive; Age 18-80yrs) were collected from prominent retina clinics of North India during 2011-2014. These were screened for temporal / nasal quadrant retinal arterial tortuosity using semi-automated digital software. A three-level grading scale was used (straight =one infliction, wavy=two inflictions, tortuous=three or more inflictions). Hypertensive retinopathy cases underwent fundus-fluorescein-angiography. Data was analyzed using basic descriptive statistics (p value <0.05 significant). Results: Arteries were mainly 'Wavy' in Healthy (average 51%-wavy,28%-tortuous,20%-straight) and 'Straight' in Hypertensives (average 50%-straight,30%-wavy,20%-tortuous). Age, sex, gender, eye side did not affect tortuosity. Increasing values of blood pressure (BP) were significantly associated with decreasing levels of tortuosity even in normotensives and prehypertensives,(Chi-square p value<0.05). Hypertensive retinopathy was present in 110/230(48%) subjects. Angiographic perfusion status in hypertensives was not influenced by tortuosity, (chi-square p value >.1). Conclusion: Mean arterial BP is a major determinant of retinal arterial tortuosity and causes a characteristic arterial 'straightening' in hypertensives while 'waviness' benchmarks health. Such morphological change is reflective of underlying auto-regulatory mechanisms but does not affect retinal microcirculation. Other structural features like caliber and branching perhaps play a more important role in determining retinal-microcirculation. Since fluctuations in BP strongly affect tortuosity patterns even in normotensives; Fundus photography could be utilized for qualitative monitoring of an individual's risk for developing hypertension during mass screening programs.

A COMPARATIVE STUDY OF THE ANATOMICAL AND CLINICAL ASPECTS OF THE FEMALE PELVIC FLOOR

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According to the traditional anatomy, the pelvic floor muscles are characterized by their origin, insertion, function and innervation. It seems to be a good way of description at first glance, but it does not give sufficient background for the understanding of gynecological diseases and up-to-date operational methods. Contrary to this, the clinical approach concentrates more on the functional description, i.e. the static and dynamic movements, the relation of muscles and fasciae, and the pathological changes caused by their malfunction. The modern, clinically oriented view is that the muscles of the lesser pelvis are the elementary components of "maintaining position of the organs in proper orientation and thereby ensuring their normal function". Therefore, any muscular abnormality may result in dislocation of the organs and/or the loss of the sphincter function of muscles. Most of the anatomical descriptions do not even mention the obvious difference between the shape and cons istency of the organs taken out of the body and of those being 'in

situ'. Our personal experiences clearly show that the understanding of the position of uterus, Fallopian tube, ovary and rectum is frequently beset with difficulties for students, since the organs removed from their original location lack the structures (muscles and fasciae) keeping them in normal position. In our work, we try to reconsile the anatomical descriptions to the clinically important contexts and relations, but only to the degree that serves students in understanding spatial relations and in acquiring firm support for clinical mentality.

PARTIAL RUPTURE OF THE TRICEPS COXAE IN TRAUMATIC POSTERIOR HIP DISLOCATION – A CASE REPORT

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Introduction. Posterior hip dislocation is a typical pathology in traumatic patients and represents with an estimated incidence of 5.2/100,000 the most common dislocation of the lower extremity. The patient described in this case report presented with a partial rupture of the triceps coxae muscle, after reduction of a traumatic posterior hip dislocation acquired during skiing. Case presentation. We present a 20-year-old female individual with athletic constitution in good health condition. She suffered trauma caused by an accident during skiing, where she jumped over a small hill border and landed in a small pit on the slope. The patient was initially treated by the alpine rescue service and flown to a trauma department. There, fracture of the right ulna and radius was diagnosed as well as posterior hip dislocation, which was treated by joint reduction. Follow-up was performed over a period of 20 months. The patient received MRI examinations one and 19 months after the accident, where a partial rupture of the superior gemellus muscle and of the internal obturator muscle were seen. Additionally, hypertrophy of the piriformis muscle was present in the second follow-up MRI. Conclusion. The rupture of parts of the triceps coxae muscle is a possible complication of hip dislocation. So far, there is no evidence regarding prevalence, long-term consequences and adequate patient management of this lesion. We emphasize to raise awareness of the anatomical and radiological appearance of muscles of the lateral rotator group.

AN EXPLORATIVE ANALYSIS OF RETROSPECTIVE DATA OF 700 PATIENTS: ACCURACY OF LOCALISATION AND CAUSE OF PRECLINICALLY SUSPECTED DIAGNOSES

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The preclinical acute patient management by non-physicians (i.e. paramedics, EMTs) is known to have large-scale differences in accuracy and specificity, depending on numerous variables, such as rural vs. metropolitan regions. The primary aim of our study was to find out differences in accuracy of anatomic localization and etiologic cause of preclinically suspected diagnoses between traumatic and atraumatic patients. Seven-hundred patients were randomly chosen from the archived protocols of 2014 of a large city emergency medical service. The patients were assorted into two same-sized groups, "atraumatic" and "traumatic", which was performed depending on the designated department. To find out suspected diagnosis, symptoms and respective anatomic region, and to match these with the eventual diagnosis, patient data was retrieved from EMS protocols and hospital reports. Statistical analysis of the two groups was performed and compared. We also evaluated side-parameters such as presence or absence of intensified trauma training of transport leading paramedic. Preliminary results showed differences in accuracy of anatomic localization and cause of preclinically suspected diagnoses. Especially anatomic localization is more precise in traumatic patients. There was no significant increase in anatomic accuracy in traumatic patients who were treated by paramedics with certified special trauma course skills, compared to patients of normally trained staff. The effect of trauma training is known to have an impact on quality of practical skills in preclinical settings. It is discuss, whether and how training in anatomy and internal medicine could improve the quality of patient evaluation by EMS workers.

ANATOMICAL OBSERVATION OF THE RIGHT VENTRICULAR MYOCARDIUM IN HUMAN FETAL HEART

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Introduction. Anatomical data of myocardium in normal fetal hearts are sparse and scanty. We aimed to investigate anatomical peculiarities of subendocardial myocardium in the inflow and outflow parts of right ventricle in the normal human fetal heart. Material and methods. Using stereomicroscope we dissected and observed myocardium in 56 formalin-preserved hearts of fetuses aged from 17 to 28 weeks. Results. We discovered that right ventricular inflow myocardium usually consisted of two layers: subendocardial (trabecular or compact) and deep (always compact). Subendocardial layer was created of trabecular bundles 275-400μm wide, which lay parallel to each other or diverged by 10-15 degrees. The angle between these bundles and long axis of the inflow part was 10-35 degrees. In 35.2% of cases in the apical and in 28.6% in the middle third we could not dissect bundles throughout because they were joined by fascicle 110-160μm wide and consequently were packed densely. Myocardium of septal band as well as subendocardial myocardium in the basal third of the inlet part was the most compact and looked like as "anatomical syncytium". A lot of fine fascicles 40-50μm wide closely connected by tiny filiform bundles formed the septal band. Conclusion. Right ventricular subendocardial myocardium in the inflow part may be compact or trabecular whereas the same layer in the outflow part is always compact. These observations

are important for diagnosis right ventricular noncompaction cardiomyopathy in fetuses.

FIBROUS CARTILAGE IN THE PLANTAR FASCIA OF A PATIENT WITH TYPE 1 DIABETES MELLITUS: A PILOT STUDY REPORT

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Introduction: Several rheumatologic manifestations are more pronounced in subjects with diabetes, i. e., frozen shoulder, rotator cuff tears, Dupuytren's contracture, plantar fibromatosis. This condition, also known as Ledderhose disease, is characterised by fibrous proliferation of the plantar fascia and is more common in men. Literature about morphology of plantar fascia is not abundant and we only have data that fibrous cartilage may be a part of enthesis in this location. Aim: The aim of the study was to evaluate the structure of a plantar fascia in patients with Type 1 diabetes mellitus. Patients and Methods: The study involved 4 male patients with Type 1 diabetes mellitus. Tissue samples of plantar fascia of approx. 4.5x2.0x0.5cm, excluding the fat tissue, were taken after the surgical amputation of the diabetic foot with the informed consent of the patients. The samples were fixed in formalin (10%) for at least 5 days at room temperature and then were embedded in paraffin for routine histology. Results: The plantar fascia was composed of dense connective tissue in three patients; however, one patient also showed the presence of chondrocytes arranged in parallel arrays, going along the collagen fibber bundles that indicate fibrous cartilage structure. Conclusions: Different morphol-ogical structure of plantar fascia were found: in one of four patients dense connective tissue was mixed with fibrous cartilage and this finding can be used in the further investigation of signalling that induces changes of cellular phenotype

COLLAGEN IV EXPRESSION IN THE PERINEURIUM OF SURAL NERVE IN AGEING AND PERIPHERAL VASCULAR DISEASE

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Peripheral vascular disease (PVD) and subsequent peripheral neuropathy are considered as the leading causes of non-traumatic amputations and disabilities in developed countries. Decline in physical functioning and loss of independence in performing daily activities are additional complications and point to their importance in wider social context. Ageing, as well, alters structure and functioning of the basement membranes in humans. Collagen IV is one of main structural components in basement membrane, so we investigated its presence in the perineurium of the human sural nerve. The study included 24 samples of sural nerve divided into four groups: younger and older vascular patients, younger and older ageing group. Younger groups were 45-64 years old, while older were 65-88 years old. Tissue samples underwent immunohistochemical staining and morphometric analysis was performed by ImageJ software. Our results showed significant rise of collagen IV immunoreactivity in both vascular groups, compared to age-matched controls ($p<0.001$ in younger, $p<0,01$ in older group). Ageing perineurium obtained higher levels of collagen IV in older group, but the difference was not statistically significant. Amount of collagen IV in younger patients with PVD was larger than in older patients, but the decrease was not significant. Thickening of perineurial sheath may lead to the disbalance of homeostasis and impaired regenerative ability in the endoneurial compartment. Future investingations should focus on researching other components of extracellular matrix of the connective tissue layers in peripheral nerve.

NEUROANATOMY FOR PSYCHOLOGISTS – STRUCTURES AND FUNCTIONS OF NERVOUS SYSTEM

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Introduction. Despite the wide range of high quality textbooks offered on the Slovak market there is no publication with colorful pictures and schemes that can serve as an principal tool for practical and theoretical teaching of neuroanatomy for future psychologists in non-medical academic programmes of Arts and Science Faculties. Following new trends in methods of teaching, it is necessary to pay more attention to quality, depth, and effectiveness of education. Such kind of illustrated textbook with the interesting graphic design should connect this important morphological subject and clinical medicine to understand the nervous system in the clinical context. Material & Methods. This publication was created by using of original, new detailed pictures, and graphic schemes and was supplemented with a short clinical notes. Results. Anatomical terms are arranged according to the international nomenclature derived from the current international "Terminologia Anatomica" (1998), and also based on the Dictionary of Anatomical Terms of Slovak authors (Holomanova and Brucknerova, 2003). More than eighty of original and color pictures, schemes, and tables demonstrate the important details of neuroanatomical structures and brain regions. The textbook provides the summaries and illustrations that are helpful to give the students understanding of this subject. Conclusion. We hope that originality and details of this book will find its application in studies of neuroanatomy for psychologists. We sincerely hope that reading of this new book may not only prove profitable to readers but will stimulate their permanent interest in the most important theoretical discipline – anatomy.

COMPOSITION OF THE RAT PSOAS MAJOR MUSCLE

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Introduction. Rat psoas major muscle arises from lumbar vertebrae and inserts at the lesser trochanter of

the femur. Unlike humans, the rat is a quadruped, and only occasionally rises on its hind legs. Therefore, composition of the rat psoas major muscle is expected to differ in relation to humans.Material and methods. Psoas major muscles of male Wistar rats were analyzed and Type I, IIA, IIB and IIX muscle fibers were typed using myosin heavy chain identification. Results. Rat psoas major muscle had predominance of fast type IIB muscle fibers with the largest cross-sectional area. Slow type I muscle fibers were present with the lowest percentage. Moreover, type I muscle fibers, together with type IIA muscle fibers, had the smallest cross-sectional area. Conclusion. Predominance of the fast muscle fiber types in the rat psoas major muscle indicates its primarily dynamic function in contrast to humans' psoas major muscle whose composition indicates its dynamic as well as postural function.

OROFACIAL CLEFTS IN SPONTANEOUS ABORTIONS AND PREMATURE BIRTHS

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Aim: The aim of this thesis was not only to define the frequency of all orofacial clefts and their particular types, but also to determine the sex of an embryo or fetus and detect their associated abnormalities. Since approximately one third of orofacial clefts is a part of chromosomal syndromes, all the samples were cultivated and cytogenetically investigated. Karyotyping allowed us to differentiate between orofacial clefts due to multifactorial causes and clefts as a part of chromosomal syndromes. Material and methods: Retrospective morphological and cytogenetic study of 43 cases of different types of orofacial clefts between 1992-2014 from spontaneous miscarriages and premature births. Results: Associated birth defects were found in 34 cases. Most of the anomalies were skeletal (23x), of NTD (19x) and of the abdominal wall (7x). Most associated anomalies were found in the R III group (93.3%), R IV (85.7%), R II (78.6%) and the least in R I group (42.9%). Cultivation was impossible in 18 of the 43 cases (42%) and thus it was impossible to determine their karyotype. 11 of the succesfully cultivated cases (25.5%) had a normal karyotype and in 14 of the cases (32.5%), numerical or unbalanced structural chromosomal aberrations were found. Conclusion: Morphological and cytogenetic analysis of embryos and fetuses with orofacial cleft offers the chance to comment on the etiological factor which influenced the miscarriage and in the case of birth defects to offer prognosis for future pregnancy, which is an important information for gynecologist and clinical geneticist.

AGE-RELATED CHANGES IN MORPHOLOGY OF THE MYENTERIC PLEXUS OF THE HUMAN ASCENDING COLON

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Background/Aim. Aging is a process that affects the structure and function of the enteric nervous system, but only some specific information about this topic was available, especially for humans. The aim of this study was to investigate the effect of age on structure of the myenteric ganglions and neurons in the human ascending colon. We examined samples of myenteric ganglions of the ascending colon obtained from 30 cadavers age from 20 to 84 years. Methods. Tissue samples are divided into three groups (20-44, 45-64 and 65-84 years). Immediately, after taking the samples were stained by enzyme histochemistry for acetylcholinesterase and by standard histological techniques (hematoxylin-eosin, cresyl violet and silver nitrate) staining. The morphometric analysis was performed using multipurpose test system M42. Results. The number of neurons per unit of area of the myenteric plexus that has been investigated in ascending colon in all three age groups expressed as mean ± SD. There is a significant decrease ($p<0.001$) in the number of neurons at people aged between 65 and 84 years, and their ganglions contain significantly less neurons. Evident was a reduction in the number of neurons in the oldest of 22.89% compared to the youngest. With aging comes to significant increase ($p<0.05$) of surface soma of the neurons and their nuclei. Conclusion. With aging comes to a significant loss of neurons, with a tendency to compensate it by increasing the size of soma and nuclei of the remaining neurons.

FRACTURES OF THE DISTAL FIBULA – BIOMECHANICAL ANALYSIS IN RELATION TO FUNCTIONAL CLASSIFICATIONS AND MORPHOLOGY

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Ankle fractures belong to the most common fractures in humans at all. According to information from different literature fractures are among the third most common. Several classifications of fractures are used following description, mechanism of injury or combinations, we use classification according to Weber in our work. The aim of the study was to verify the possibility of biomechanical reproduction of clinical and morphological findings. The bone of 5 dry specimens of the distal fibula from collections of the Department of Anatomy was grounded and evaluated. For better understanding of the bone structure in the region 10 dry specimens were analyzed by uCT. For a biomechanical analysis the FEM method for three types of Weber classification was applied. The geometric model of the fibula and tibia was created using a series of CT images from a healthy individual. The resulting values of reduced stresses clearly show that the loading of the bone tissue, was dependent on the fracture line position and on surrounding systems of cortical and cancellous bone. Using the FEM, we showed the stress strain distribution in bone tissue in different fractures, using the same loading conditions.

Our results would help to find the best fixation system position for each type of distal fibula fractures. Supported by GAUK 790214/2014

ANATOMY AND PATHOLOGICAL ANATOMY OF PERIODONTIUM DEPENDING TO THE STATE OF ORAL HEALTH

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Introduction. High level of oral disease especially tooth decay and periodontitis classifiy Slovakia as less developed countries of the European Union. This issue can be solved by looking at template of economicaly well developed countries and taking radical action against these issues and making sure right steps has been taken to highlight each structure at healthy and pathologically changed periodontium. Currently students are using not best educasion tools to receive correct and sufficcient information whic makes confusion in relevant subjects. Material and Methods. The extracted teeth on based on their condition are appointed to the group by periodontal ligament spaces performed under X - ray examination. The structure of periodontium will be examined by histological examination. Results. Assuming changes in the anatomy of root cementum of teeth, periodontal ligaments, cementoenamel junction and the area of the root apex. Conclusion. Main task for research is to compare physical anatomy and pathological changed anatomy of periodontium depending from oral health and highlight posibilities and choosing right steps for curing periodontium depending of anatomy and suggest one preferable terminology. Therefore different terminology and expressions are used to identify tissues in biological and pahtological casses. Based on this we would like create a structure of anatomy and pahtological anatomy of periodontium with precise terminology.

ASPHYXIA AND BICUCULLINE-INDUCED SEIZURES REDUCE CONNEXIN 43 (CX43) EXPRESSION IN THE HIPPOCAMPUS AND CEREBRAL CORTEX OF NEONATAL PIGLETS

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During perinatal asphyxia and subsequent seizures, cerebral blood flow cannot match the metabolic demands of neurons resulting in oxygen and glucose deficiency triggering changes in cerebral protein synthesis. Gap junctions in neurons and astrocytes dominantly express the Cx43 subunit. Our purpose was to determine whether asphyxia/seizures would affect cerebral Cx43 expression in newborn piglets, an accepted large animal model of the human term neonate. Anaesthetized, room air ventilated, 1-day old piglets of either sex (body weight 1-2 kg, n=30) were divided into four experimental groups: naive controls; sham-operated time controls; seizure animals (bicuculline, 3 mg/kg iv); and asphyxia. During the course of the 8-hour survival, the mean arterial blood pressure, the arterial pH, pCO2, and pO2 values were monitored and maintained within their normal physiological ranges. Cx43 levels were examined with immunoblotting and immunocytochemistry in brain regions most vulnerable to hypoxia: the hippocampus and the cerebral cortex. Seizures and asphyxia decreased significantly Cx43 levels in the hippocampus, but only seizures could reduce Cx43 in the cortex, albeit not in every region assessed compared to the control groups on Western blots. Immunocytochemistry further revealed that the decreased Cx43 levels after seizures and asphyxia are mainly restricted to the molecular layer of the frontal cortex and the stratum lacunosum of the hippocampal CA1 area. The described reduction of cerebral Cx43 expression levels may contribute to the patho-mechanism of hypoxic/ischemic encephalopathy of neonates developing after perinatal asphyxia often complicated by seizures.

HISTOCHEMICAL, IMMUNOHISTOCHEMICAL AND ELECTRON MICROSCOPIC STUDY OF MULTICELLULARITY OF THE HUMAN THYMIC HASSALL´S CORPUSCLES

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The thymic corpuscles, so-called Hassall´s bodies are the most characteristic, organ-specific structures of the mammalian thymus. Current the most accepted definition of Hassall's corpuscles is according to Bodey et al (2000) as a unique, antigenically distinct, functionally active, multicellular component of the non-lymphocytic cellular microenvironment of the thymic medulla. The present study examined 95 human thymic tissue samples, which were per-operatively obtained from children undergoing median sternotomy and corrective cardiovascular surgery in the Children's Cardiocenter in Bratislava, Slovakia. Eighty samples were taken from children younger than one year, 15 from children between the second and the 12th year of life. The tissue was processed with histological, histochemical (PAS method - glycoproteins, Koss-method – $Ca2^{+}$ ions, acid phosphatase and alkaline phosphatase activities) immunohistochemical (the expression of cytokeratin AE1/AE3, desmin, actin, S100 protein, CD68, CD34, CD20 and CD45RO, p53 protein, bcl2 oncoprotein, Ki-67 and survivin), electron-microscopical and confocal study. The results were demonstrated by the light microscope Leica DM2500, electron microscope FEI Morgani 268D, confocal microscope Olympus IX81. The size, structure, as well as the number of Hassall´s corpuscles varies during ontogenesis as well as under some pathological conditions. The size and structure of HC differs among thymuses of children with different types of congenital heart defects. In our previous studies (Varga et al.; 2010; Mikusova et al. 2012) we observed the most prominent changes in the size and structure of Hassall`s corpuscles in children with ventricular septal

defect, atrioventricular septal defect, tetralogy of Fallot and transposition of great vessels. We assumed that these changes of thymic medullary microenvironment are associated with disrupted formation, migration or differentiation of the cells of cardiac neural crest which are essential in normogenesis of both, the heart and the thymus.

PAX2 SIGNALING IN THE DEVELOPING SPINAL CORD OF HUMAN AND RAT EMBRYOS

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In this study we aimed to compare temporal and spatial expression of the Pax2 in the developing spinal cord in human and rat embryos throughout early stages of development. 22 human embryos and 22 Sprague Dawley strain rat embryos of Carnegie stages (CS) 14, 18 and 20 were examined in this study. The human and rat embryos were fixed in 4% para-formaldehyde and embedded in paraffin according to standard methods. Tissue blocks were serially cut in transversal direction and mounted on glass slides. Expression of Pax2 was determined immumo-histochemically. Slices were incubated with the first antibody Pax2 and in the next day the sections were incubated with universal secondary antibody. Experiments on both human and rat embryos exhibited a similar temporal expression pattern of Pax2 in the formation of the spinal cord. There was revealed statistically significant tendency for expression Pax2 to increase at later stages of the development. In human embryos regional differences are not iced at CS 14 - 20, when the wall of the spinal cord has differentiated into ventricular, mantel and marginal layers. In the dorsal part of the developing human embryos Pax2 expression was much stronger in all three spinal cord layers, at the same time being much weaker in the ventricular layer of the ventral part of the spinal cord. However, no differences the regional expression of Pax2 was noticed in the dorsal or in the ventral parts of the developing spinal cord in the Sprague Dawley strain rat embryos.

CADMIUM AND OTHER NEUROTOXIC METALS IN AMYOTROPHIC LATERAL SCLEROSIS (ALS): A POPULATION-BASED CASE-CONTROL STUDY

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Introduction: We conducted a population-based case-control study on possible associations between human exposure to toxic metals and sporadic amyotrophic lateral sclerosis (ALS). Material and Methods: ALS patients were enrolled from different care centers of Sardinia, an Italian region characterized by elevated rates of ALS cases and significant history of mining activities. Al, Cd, Hg, Mn and Pb concentrations were determined in blood, hair and urine by ICP-MS in 34 ALS patients (mean age, 62±10 years, male/female ratio 1.6) and 30 controls (mean age, 65±11 years; male/female ratio 1.5). Results: In blood samples, concentrations of Al (p=0.045) and Pb (p=0.026) were higher in ALS patients than in control. In hair of ALS patients, a significant depletion of Al (p=0.006) and Mn (p=0.032) respect to controls was found. In contrast, there were not significant differences between cases and controls in urine samples. As well, cases and controls showed no differences in Hg patterns; however, ALS patients showed strong correlations among Hg levels in blood, urine and hair, while controls did not. In addition, metal-metal correlations were investigated, showing that Cd, Hg and Pb display synergic pattern, differently from Al and Mn (antagonistic pattern). Discussion: This study suggests that some metals could be involved in the ALS pathology depending on environmental exposures to toxicants, as well as on internal degenerative process and metal-gene interactions. The study was funded by Fondazione Banco di Sardegna 2013.

ELECTRON MICROSCOPIC ANALYSIS OF SCIATIC NERVE CUT INJURY AFTER OZONE THERAPY

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Objective: The present study focused on electron microscopic analysis of sciatic nerve cut injury after ozone therapy. We have investigated whether an oxygen/ozone mixture would have potential against the sciatic nerve cut injury and the effects of ozone on nerve healing in rat peripheral nerve cut model. Material and Method: In our study, a hundred adult, male, Rattus norvegicus. Wistar albino rats weighting 400-450 gr were randomly allocated into four groups: sham group (n=20), control group (n=20), group 1(n=30), (only nerve cut injury, no ozone admin-istration) and the ozone-treated group called as group 2 (n=30) (rats treated with 35-40 ug/ml and 5 cc O3/O2 mixture via intraperitoneal for 2 months). After operation ozone administration was performed from the first to the end of the eighth postoperative week. Sciatic nerve regeneration was evaluated by transmission electron microscopy. Results: Electron microscopic analysis revealed more schwann cells and cytoplasm organelles in the ozone-treated group. All nerve trunks in group 2 contained regenerative remyelinisation axons with difference diemeters. And it was observed that increased endoneural connective tissue among the fibers. Conclusion: This study suggests that ozone injected around rat's peripheral nerve will not cause serious sequelae or serious damage to the structure of peripheral nerve. It was determined that ozone improves regeneration of experimental peripheral nerve cut with electron microscopic procedure. To sum up, we can say that ozone therapy has opened up a new future in the medical field.

FUNCTIONAL ANALYSIS OF SCIATIC NERVE CUT INJURY AFTER OZONE THERAPY

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Objective: The aim of our study is to investigate the motor and sensorial functional analysis of sciatic nerve

cut injury after ozone administration on nerve healing. Material and Method: 100 adult, male, Rattus norvegicus. Wistar albino rats,400-450 gr, divided into 4 groups.Sham (n=20), Control (n=20), Group 1 (n=30) (nerve cut injury), Group 2 (n=30) (nerve cut injury and 35-40 ug/ml and 5 cc ozone-treated group via intraperitoneal for 2 months).We used walking tracks analyses and pinch tests. Before the beginning of experiment and after ,1th day and 2nd, 4th, 6th and 8th months sciatic functional index (SFİ) and withdrawal refleks (WRL) were measured for each group. Results: Statistically significant difference was found among the groups,p<0.05 and Motor functional analysis showed that in group 2 postoperation 2nd month=-80±5,19 and postoperation 4th month=-37± 6.11 and pinch analysis showed that postoperation 2nd month p=0,035. p<0.05. SFI values of the 2nd group showed significant difference (p<0.05) compared with the 1th group. Conclusion: As a conclusion, the use of walking track analysis and pinch tests assessing the functional status of the sciatic nerve during the regeneration process. And application of ozone can improve nerve healing in group 2 than group 1 rats, starting the postoperation 2nd month. So ozone therapy can be as a new treatment procedure to clinical end experimental models.

ELECTROPHYSIOLOGIC ANALYSIS OF SCIATIC NERVE CUT INJURY AFTER OZONE THERAPY

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Objective: The aim of our study is to investigate the effects of intraperitoneal ozone on the rat sciatic nerve cut injury were examined by electrophysologic method. Material and Method: 100 adult, male, Rattus norvegicus, Wistar albino rats weighting 400-450 gr were divided into four groups.Control (n=20), Sham (n=20), Group 1 (n=30) (nerve cut injury), Group 2 (n=30) (nerve, cut injury + ozone was given 35-40 ug/ml and 5 cc by intraperitoneal for 2 months). Before the beginning of experiment and after,1th day and 2nd, 4th, 6th and 8th months electromyographic (EMG) tests were performed for each group.Under general anesthesia,rats were electrically stimulated and EMG recordings were taken by bipolar needle electrodes. Peak to peak amplitude, maximum, minimum positive peaks were measured. EMG recording were made with MP100 data acquisition apparatus and were assessed by BIOPAC's AcqKnowledge® 4. Results:As a result of electrophysiologic analysis revealed that components p min, p max, p-p, std. dev. were significantly increased in group 2 compared with group 1 (p<0.001). And p min, p max, p-p, std. dev. also were significantly increased in the group control and sham (p<0.05). Conclusion: In conclusion, application of ozone can improve nerve healing in group 2 than group 1 rats. It was determined that ozone improves regeneration of experimental peripheral nerve cut with EMG. EMG recordings may provide a valuable way to evaluate the sciatic nerve regeneration on experimental rat models.

ULTRASOUND GUIDED PULSED RADIOFREQUENCY TREATMENT OF THE PUDENDAL NERVE IN CHRONIC PELVIC PAIN

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Introduction. Chronic pelvic pain is a condition which arises in cases of pudendal neuralgia, interstitial cystitis, piriformis syndrome, ilioinguinal, iliohypogastric, genitofemoral nerve neuropathies. For treatment, medical therapy, pudendal nerve block, decompressive surgery, neuromodulation methods are used. In this paper, we reported the clinical effectiveness of pulsed radiofrequency treatment which we applied to pudendal nerve under USG guidance in three patients who were admitted to our pain clinic due to chronic perineal pain. Material & methods. These three patients were being followed up with diagnoses of interstitial cystitis and pudendal neuralgia. Diagnostic pudendal nerve block was applied to the patients who were planned to undergo pudendal nerve pulsed radiofrequency. Results. Pudendal nerve may be blocked with various imaging methods in perineal pain. Transgluteal and transvaginal approaches may be used in pudendal nerve block. Recently, USG-guided pudendal nerve blocks done in lithotomy position are reported. Applying pudendal nerve block with fluoroscopy requires difficult additional equipment. Various USG-guided trials have been done however pudendal nerve is small and visualization of arteria pudendalis which may be taken as the landmark requiring Doppler is not easy. Therefore, visualization of sacrotuberous ligament via USG easily in lithotomy position facilitates pudendal block application in lithotomy position. Conclusion. Pulsed radiofrequency application in lithotomy position under USG guidance provided an adequate analgesia; patient satisfaction and no complications were encountered in three patients who had chronic pelvic pain. Randomized controlled trials are required for showing the effectiveness and reliability of this treatment.

A CASE REPORT: DOUBLE FEMORAL VEIN

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İntroduction: The vein anatomy is extremely variable due to venous anomalies occurring during the late development of embryo. In our case, we have identified variation in the femoral vein and its components. Material and Methods: A double femoral vein was observed in the femoral triangle of a 55 year old male embalmed cadaver during routine dissection of the lower limb in our laboratory. Results: This case has been detected during routine dissection for the training of undergraduate medical students. Femoral vein in 9 mm diameter in this case separated into two veins in adductor canal. The diameter of double veins measured as 7 mm and 6 mm. The femoral artery in 9 mm diameter passed from between these two veins. 7 mm and 6 mm in diameter femoral veins connected a

small connection branch to each other near the apex of femoral triangle and a superficial vein drained to this connection branch. These veins were reunited after 9.7 cm from the cleavage site. The diameter of the femoral vein just after the junction was 10 mm. Conclusion: Double femoral vein is not rare. But in our case, it is important due to the existence of a connection branch. Double femoral vein is crucial for investigation of the lower limb venous network, particularly for deep vein transposition on the opposite limb and the mapping of cardiovascular disease. Additionally, it is important to avoid from misdiagnosis of deep vein thrombosis in the femoropopliteal veins.

CORRELATION AND AGE DYNAMIC INVESTIGATION OF THE HARD TISSUES DENSITY OF THE OF DENTOMANDIBULAR APPARATUS DURING TEMPORARY BITE FORMATION

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Introduction. Before the end of the maxilla-facial area formation changes, not only structure but also qualitative indexes of the mineralized tissues, their density. The aim - research of the correlation of the indexes of the osseous tissue density of the jaws, teeth germs of both generations and of temporary teeth in children till the end of temporary bite formation, and also peculiarities of their age dynamics. Materials. The investigation was made on 120 radiovisiograms of the newborns and children till 4 years old. The upper jaw osseous tissue density was measured on the level of body and alveolar process, and on the lower jaw – on the level of the basis and alveolar part, temporary teeth and germs of the teeth. In order to make measurements of tissue density, dental RVG SIEMENS with TROPHY RADIOLOGY software was used. Conclusions. The medium index of the osseous tissue density of the jaws was the highest, in comparison with germs indexes of the teeth. Osseous tissue density of the jaws and hard tissues of the temporary teeth and germs of teeth has significant positive dynamics; the most significant was density grows of the germs of the permanent teeth. Density of the osseous tissue of the upper jaw body and lower jaw basis have a tendency to reducing, and density of the alveolar process of the upper jaw and alveolar part of the lower jaw–increase significantly. Density indexes of the osseous tissue on the lower jaw are higher than on the upper jaw.

THE DIFFERENTIATIVE PROPERTIES OF HUMAN "GLIA-LIKE" CELLS

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Introduction: Glial fibrillary acidic protein (GFAP) is considered to be the best astroglial marker. However, the majority of cultured cells from adult human brain do not express GFAP and are often termed as "glia-like" cells. Material and methods: Brain biopsies were obtained from ten adult patients with non-tumoral diagnoses. The cell types were identified by indirect and double immunofluorescence methods using antibodies to GFAP, O4, CD 11c, vimentin (Vi) and fibronectin (Fn). The cultures were subcultivated until passage number 20. Results: In confluent primary cultures we have found only small amount of immunocytochemically distinct glial cells negatively stained for fibronectin and positively for vimentin. However, they disappeared by 4th passage. The remaining cells (95-98%) were spindle or flat "glia-like" cells expressing only fibronectin and vimentin. During passage 8 to 15 the cell growth spontaneously slowed down, cells changed their morphology and showed pos itive staining for GFAP. The intensity of Fn staining slowly decreased in all cultures. However, the majority of GFAP-positive cells retained the Fn expression at various intensity. Conclusions: Our results demonstrate differentiative properties of human "glia-like" cells. Initially GFAP-/Vi+/Fn+ predominant cell population in adult human brain cultures became GFAP+/Vi+/Fn+ during prolonged subcultivation. We suggest that "glia-like" cells are precursor cells which may differentiate into GFAP-positive astrocytes. This study was supported by grants: VEGA No.1/3439/06 and ITMS: 26240120023

FIRST EVIDENCE OF MERKEL CELLS IN VAGINAL EPITHELIUM

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Introduction. Human Merkel cells were first described by Friedrich S. Merkel in 1875 and named "Tastzellen" (touch cells) assuming a sensory touch function within the skin. They are localized predominantly in the basal part of the epidermis. Especially they are concentrated in touchsensitive areas in glabrous and hairy skin for example palmar part of the hands, especially the finger pads, including the feet and plantar aspects of the toes. Other interesting localizations are mucosa of mounth cavity, hard palate, gingiva and oesophagus. Recently they were identified also in the skin of eyelids. MCs also can be identified in erotogenous zones such as male prepuce and the female clitoris. Thanks to its localization in the basal part of the epitelium they are in contact with sensory nerve endings. Not all MCs are associated with nerve axon. Merkel cells can be divided into innervated and non-innervated ones. Merkel cells have been a subject of investigation in human and animal studies for over a century, but their origin, function(s) and exact distribution in human skin remain largely unknown. In routine light microscopy of hematoxylin and eosin (H&E) stained human skin MCs can be hardly identified. Antibodies against simple-epithelial cytokeratines allow an easy and clear-cut identification of MCs. Material and method - Histological and immunohistological examination: We obtained histological sample from the patient during gynecological surgery after informed consent. The aim of our research was firstly identify Merkel cells in the epithelium of human vagina. The formalin-fixed and paraffin-embedded samples were sectioned into 2 µm thick slices and stained by conventional staining methods by hematoxylin and eosin. Immunohistochemical staining was performed using the biotin-

avidin technique with primary human antibodies against cytokeratine 20 (clone Ks20.8.). Visualization of the cells was developed with DAKO LSAB/HRP kit and DAKO En Vision/ HRP kit. Results and conclusion: Immunohistological staining revealed Merkel cells in the epithelium of human vagina. CK20-positive MCs were localized in the basal part of the vaginal epithelium, some cells were dispersed singly and some in clusters. Some cells were situated also in connective tissue under the epithelium. They were well visible, because of their oval shape and larger size compared with other epithelial cells. Conclusion: Further investigation of the incidence, origin and functions of Merkel cells in vaginal epithelium and its epithelial biology will be of interest. Human vagina is very interesting and unexplored area for studying Merkel cells thanks to its rich blood and sensory supply (research of G- spot). It will be interesting to find out which kind of MCs and which areas are rich in MCs.

CORRELATION BETWEEN MORPHOMETRY OF THE SUPRASCAPULAR NOTCH AND ANTHROPOMETRICAL MEASUREMENTS OF THE SCAPULA - A COMPUTED TOMOGRAPHY STUDY

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Introduction The suprascapular notch is a clinically important site because it is the main site of injury and compression of the suprascapular nerve. Its shape and size is one of the most important risk factors in suprascapular nerve entrapment. Materials and Methods A total of 130 scans of shoulders by a helical 32-row multidetector computed tomography scanner in 65 randomised patients were retrospectively analysed. The following chosen scapular measurements were performed: morphological length, morphological width, projection length of the scapular spine, length of the lateral border of the scapula, length of the superior border of the scapula, morphological heights of the: supraspinous fossa and infraspinous fossa. The following suprascapular notch dimensions were collected: maximal depth, superior and middle transverse diameters. Results The superior transverse diameter of the suprascapular notch correlates with the length of the superior border of the scapula and negatively with the length of the lateral border of the scapula. The maximum depth of the suprascapular notch correlates with the morphological length of the scapula, the length of the lateral border of the scapula and the morphological width of the scapula. In addition it has been shown that the length of the superior border of the scapula correlates more closely with the superior transverse diameter of the suprascapular notch than the middle transverse diameter of the suprascapular notch. Conclusion It could be supposed that scapulae with a wider superior border have a shallower suprascapular notch. It may be also concluded that humans with longer scapulae have deeper notches

FIRST UPPER PREMOLAR MORPHOLOGY

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Introduction: The endodontic treatment represents the last possible way of saving the tooth. It is important to know the correct anatomical and morphological internal structure of the tooth, especially segmentation and diversity of the root system, to be able to execute this endodontic treatment exactly. By endodontic treatment of the first upper premolar we observe many different structure variations, that differs not only in number (1-3) of root canals, but also in many variations of accessory canals and apical delta. Since the essence of the endodontic treatment is based on the tooth channel system sealing, it is really important to be prepared for different anatomical morphological variations. Matherials and methods: We soaked the first upper jaw teeth in 3% H2O2 for 72 hours. Afterwards we washed them with clean water, packed in Lukasterick bags and sterilised in autoclave. On those teeth we studied the external and internal structure of the tooth anatomic. Result: We assume that more than 70% of the upper first premolar will have two roots with two root canals, 25% will have one root with two root canals. The remaining percentage will consist of various modifications and variations. Conclusion: The result of endodontic treatment mainly depends on the complexity of the internal anatomy of the tooth.

ANATOMICAL POINT OF VIEW ON ORAL HEALTH OF OUR PATIENTS

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Dentist is not only responsible for healthy teeth and aesthetic results of restorations, but also for the overall health of their patients. The aim of our research is to define the various anatomical regions of the head and neck important for dentists and possible route of pathological processes of odontogennic origin with implications in clinical practice. The study discusses the use of knowledge of the topographic anatomy in the daily practice of dentists. Especially highlights the need anatomical knowledge in orthopedic dentistry, especially orthodontics and the temporomandibular joint disorders. There is an important role of muscle imbalance in the development of starting temporo-mandibular joint disorders. An important factor that reduces the quality of life are abnormal anatomical conditions of the upper respiratory tract and naso-maxillary complex often associated with orthodontic anomalies and obstructive sleep apnea. We did not forget about the quality of oral health of older patients and mapping of anatomical and physiological changes of orofacial skeleton in the aging process.

ULTRASTRUCTURAL HEMOMICROCIRCULAR CHANNEL LINKS OF RAT TESTICLE OF STREPTOZOTOCIN-INDUCED DIABETES

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Streptozotocin-induced diabetes in rats is frequently used to study the disturbances in lipid metabolism under diabetic conditions. Methods. The researches have been performed on 20 white mature male rats aged 4.5 to 7.5 months with body weight of 130 to 150g. Research material is represented by ultra-microscopic testicle slice. Experimental diabetes modelling was performed through single intraperitoneal injection of Streptozotocin. Animals in whose blood glucose concentration in 2, 4, 6, 8, 10 weeks after launch of experiment was above 13.4 mmol/l were used for research. Results. After 10 weeks of experimental diabetes run, hemocapillary channel undergoes significant changes. Due to projection of increased in size endotheliocyte nuclei into capillary lumen the latter acquires irregular slit-like form. Endoplasmic reticulum is characterized by dilations, vacuolated cisterns with irregular contours, loosing ribosomes affixed to their surface. Basement membrane is thickened, acquires vague contours. Cericyte cytoplasmatic appendixes contain substantial number of vesicles and vacuoles. In the capillary lumens there are the erythrocytic sludges, thrombocyte aggregates. By the nucleus there are the dilated and destroyed cisterns of Golgi apparatus and granular endoplasmic reticulum, mitochondria with destructive changes. Plasmalemma luminal surface forms numerous invaginations into capillary lumen. Basement membrane is irregularly thickened. Capillary sclerosis occurrences accumulate, pericapillary spaces are dilated. Angiopathy is a trigger mechanism for diabetic development of testicle structural changes.

APELIN EXPRESSION OF L-NAME INDUCED HYPERTENSION IN RAT KIDNEY TISSUES

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Introduction : Hypertension is important health problem that comes out by the persistant high value of systemic blood pressure and leads to serious complications. Hypertension lays the groundwork for kidney damage and the cerebrovascular diseases. Therefore, recent studies are focused on to reveal underlying mechanism of hypertension. Material & Methods: In our experimental study were used 35 (hypertensive group n=20, control group n= 15) Rattus norvegicus Wistar albino rats. Hypertension was induced by oral administration of a non-selective NO synthase enzyme inhibitor [Nω-nitro-L-arginine methyl ester (L-NAME), 25 mg.kg-1.day-1] in daily drinking water for a period of 6 consecutive weeks. Blood pressure was monitored periodically by a non-invasive tail-cuff method. Western blot and immunohistochemical methods were used to localize apelin and expression of the apelin reseptor (APJ). Results: In generally, in the kidney tissues of the hypertensive rat, we found that the cortex renalis was narrowing, medulla renalis was wide. Statistically significant difference was observed in apelin receptor expression between control (2.401±0.29) and hypertensive (0.913±0.0714) groups ($p<0.001$). Conclusion: In kidney tissues, decreasing of the apelin ve expression of the apelin reseptor (APJ) was determined. We thought that our findings could be useful for the experimental or clinic studies of the hypertension and the apelin.

ANTHROPOLOGY AND PALEOPATHOLOGY OF NORTH SARDINIA POPULATIONS FROM PRENURAGIC PERIOD TO THE MODERN AGE

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We present the results of the anthropological and paleopathological analyses of seven necropoles on northern Sardinia from 2700 BC to the Modern Age. Analysing the population, numerous are of indeterminate sex, the percentage of male and female is equivalent while in nuragic period are more females. Age estimation shows mainly adults from 25 to 45 years, with higher infant mortality (11/17 y) in the prenuragic period. The average height is 155cm for females and 160cm for males, while in prenuragic period the average male height is 168cm. Pathologies are very low in the nuragic and prenuragic period and most attested in the Roman and medieval age with a high incidence of arthropathies and metabolic diseases. In a further attempt to trace back the antiquity of malaria on the island, bone samples were investigated by immune-chromatographic approach. Three of 133 samples (2,3%) from Sa Figu- Ittiri site showed a positive signal to falciparum malaria and to Leismania infantum infection. No further evidence from Malaria infection was found in the samples from earlier and later periods. Shotgun metagenomics could not confirm the presence of ancient pathogenic DNA. Conversely, a 6.5 fold coverage of Brucella melitensis genome was obtained by shotgun metagenomics from a male from the Medieval cemetery of Geridu-Sorso. Lastly, Yersinia pestis F1 antigen was identified, by immune-chromatography, in the skeletal remains of 14 out 23 (60,8%) individuals exhumed from mass burial in Alghero. Funded by RAS (LR 7 agosto 2007 n.7, 2010.)

THE CELLULAR HETEROGENEITY CONTRIBUTE TO DIAGNOSTIC DIFFICULTIES OF GLIOMAS

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Introduction: It is generally accepted that glial fibrillary acidic protein (GFAP) is the best astroglial marker. However, GFAP is abundant only in benign type of

astrocytic tumor, while malignant types the co-expression of glial and epithelial markers in glioblastoma cell lines. Material and methods: Three glioblastoma cell lines 8-MG-BA, 42-MG-BA and GL-15 were used for this study. Indirect and double immunofluorescence staining was performed with glial marker antibodies to GFAP and epithelial marker monoclonal pan-cytokeratins (CK). Results: Immuno-fluorescence analysis showed the presence of GFAP- and CK-positive cells in all examined cell lines. However, big differences were found in the intensity of staining as well as in the number of positive stained cells: 8-MG-BA GFAP+(1%)/CK+++ (7%), 42-MG-BA GFAP++ (50%)/CK+ (0.1%) and GL-15 GFAP +++ (70%)/ CK++ (3%). Conclusion: The metastatic carcinomas to the brain tissue can be difficult to distinguish from gliomas. Our results demonstrate high heterogeneity of GFAP and CK expression in glioblastoma cell lines which may mimick the in situ heterogeneity of gliomas. Low intensity of staining or absence of glial and unexpected presence of epithelial marker proteins in glioblastoma cells may contribute to the confusion in diagnostic evaluation of brain tumors. This study was supported by grants: VEGA No.1/3439/06 and ITMS: 26240120023.

CONGENITAL ANOMALIES OF CHILDREN WITH COLON MOTILITY DISORDERS

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Introduction. The most common congenital gut motility disorder is the Hirschsprung disease (HSCR). This anomaly is characterized by an absence of neural crest-derived enteric neuronal ganglia. The aim of our study was analyze the relationship between HSCR and other congenital anomalies or malfunctions. Patient and Methods. We examined 130 patients with Hirschsprung disease from Slovakia for last 10 years. During patients examination we focused not only for morphologically abnormalities, but also functional anomalies. Results. The incidence of associated congenital anomalies in our patients with HSCR was 26.1%. But if we add functional defects (hypo-thyroidism, malfunction in cellular immunity, neurological deficit) to the morphological congenital abnormalities, the rate of the patients with HSCR with additional defects achieves 50.1%. Nine of our patients (6.9%) had syndromic HSCR. The most frequent disorder (13.6% of patients) was primary deficiency in cellular immunity. More than 12.3% of patients with HSCR had genitourinary abnormalities, in 10.0% of patients variable degree of psychomotor retardation was observed, and skeletal, muscle and limb anomalies involved 7.7% of patients. In 7.6% cases of patients we found congenital hypothyroidism (including 2 cases of agenesis of thyroid gland). More than 6.1% of patients presented with an associated anomaly in gastrointestinal tract (mostly anorectal malformations). Up to 5.5% patients had a congenital anomaly of heart, 3.8% had ophthalmic and 3.1% had craniofacial anomalies. Down syndrome was a main diagnosis in 3.8% patients. Conclusion. Approximately third of all human congenital malformations are estimated to derive from the various segments of neural crest anomalies. American pathologist Robert P. Bolande in 1974 coined the term *neurocristopathies* for various neurologic, endocrine, digestive, or other disorders arising from impaired growth, differentiation, or migration of neural crest cells. Hirschsprung disease, as a neurocristopathy, has a strong association with numerous congenital anomalies, syndromes and also functional abnormalities. Most of these anomalies are based on disrupt development, migration or differentiation of multipotent neural crest cells during embryogenesis.

MORPHOLOGICAL SUBSTANTIATION OF OSTEOSYNTHESIS IN TREATMENT OF THE PATIENTS WITH METABOLIC PATHOLOGY

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Introduction. The duration and success of the bone fractures treatment depends on the complexity of the injury, the patient's general condition and bone tissue status. Cause of the pathological changes of the mineral composition and structure of bone, and therefore a decrease in its ability to regenerate, are background pathologies, which are associated with metabolic disorders due to lesions of the endocrine glands, liver, kidneys and drug addiction. These factors influence to the choice of treatment. In modern traumatology the osteosynthesis is widely used. It provides a stable fragments fixation and accelerates the recovery of the functional bone's capacity. The aim of research – to study changes in the bone tissue, developing on the background diabetes, hypo-thyroidism, and long-term use of opioid drugs and the justification for the use of plates for osteosynthesis in the treatment of patients with metabolic disorders background. Materials and methods: 50 rats, that simulated the background pathology: diabetes (15), hypothyroidism (15), opioid addiction - (15), 5 animals – control group. The injury was modeled by destroying the integrity of the lower jaw bone tissue under thiopental anesthesia. Monitoring the bone tissue's status, in the area of injury, was performed by X-Ray. In animals with various types of background pathology - fracture healing increased to 7-10 days compared to the control group. The animals performed osteo-synthesis, duration of rehabilitation decreased for 5-7 days. Results of the study showed, that for accelerating the recovery of the functional bone's ability it's advisable to additionally fix the wreckage by osteosynthesis.

MYOGENIN EXPRESSION IN RAT SKELETAL MUSCLES

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Introduction: Transcriptional myogenic factors are expressed during process of denervation or regen-eration in adult skeletal muscles. The family of basic helix-loop-helix (bHLH) regulatory factors consists of

MyoD, Myf-5, myogenin and MRF4. MyoD, Myf-5 and MRF4 can act as myogenic determination factors, directing progenitor cells into myogenic program. Myogenin, MRF4 and MyoD can control myogenic cell differentiation which is characterized by activation of muscle genes and formation of muscle fiber. The aim of this study was to investigate expression of myogenin during the process of muscle regeneration in fast and slow skeletal muscles. Material and methods: In 2-month-old Wistar rats, the regeneration process was induced in both type of muscles, slow (m.soleus, SOL) and fast (m. tibialis anterior, TA) by injection of 1 ml of local anesthetic bupivacaine and transection of the sciatic nerve near head of the femur. Immuno-histochemical and Western blot analysis were performed for detection of myogenin in SOL and TA muscles. Results: Immunohisto-chemical analysis of TA and SOL muscles during the process of regeneration demonstrated that both myonuclei and satellite cells were myogenin positive. Western blot analysis showed a significant up-regulation of myogenin protein in TA and SOL muscles in first 14 days, and protein expression could not be detected after that period. Conclusions: In adult skeletal muscle myogenin is expressed as satellite cells begin to differentiate. Myogenin, a key regulator of myogenesis, controls muscle atrophy upon denervation and also has role during muscle regeneration.

INFRAORBITAL CANAL – RELATIONSHIPS WITH MAXILLARY SINUS

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Introduction: Infraorbital canal is in its course closely related to the maxillary sinus and orbital floor. The aim of our work is to investigate relationships between infraorbital canal and maxillary sinus and elucidate whether there is the agreement between the two sides in respect to the pattern of protrusion. Material and Methods: The study was performed on 101 skulls (=202 sinuses) using CBCT. On coronal plane images we evaluated relationships between sinus cavity and infraorbital canal. Results: Out of 202 sinuses, some level of protrusion of the infraorbital canal into the sinus was seen in 187 (92.6%) cases, most commonly partial (part of the canal diameter within the sinus lumen; 47.0%) and complete (entire canal diameter within the sinus cavity; 34.2%). In a total of 23 (11.4%) sinuses, the canal was appended on a bony mesenterium within the sinus cavity. In 65/101 skulls (64.4%), the relationship between the canal and the sinus was identical on the left and the right side. However, the agreement between the two sides in respect to the pattern of protrusion was only moderate (Gwet's AC1=54.6%). Conclusion: Relationships between infraorbital canal and maxillary sinus were extremely variable. Variability is high both between subjects, but also between the left and the right sinuses within the same subject. Knowledge of these variations is essential during surgical procedures (e.g. polyps or tumors excision) in maxillary sinus to avoid iatrogenic injuries of the neurovascular structures located in this canal.

MOTOR INNERVATION OF ADDUCTOR MAGNUS IN FETAL CADAVERS

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Objective: The purpose of this study is to investigate which regions of the adductor magnus are innervated by the obturator nerve and by which sciatic nerve. Material and Methods: In this study 200 limbs from 100 embalmed fetuses aged between 18-40 weeks of gestation with no external pathology or anomaly were studied in department of our Anatomy Laboratory. Fetuses were obtained from Isparta Maternity and Children's Hospital between 1996 and 2014. Written consent from the families and an approval from ethics board was obtained. Motor innervation of adductor magnus was examined by dissection. The adductor magnus was divided into four parts (M1-M4) based on the locations of the perforating arteries. Findings: Generally M1–M3 parts of adductor magnus are known as the adductor part and they are innervated by the obturator nerve and M4 part is known as the hamstrings part which is innervated by the sciatic nerve. But in our study M1 was supplied only by the obturator nerve and M2, M3, and M4 received innervation from both the posterior branch of the obturator nerve and the tibial nerve portion of the sciatic nerve. Conclusion: The present study has revealed that motor innervation of the adductor magnus during the fetal period. Here, we showed that the sciatic nerve supplies not only the hamstrings part but also the adductor part. We hope that present results can be considered as providing some useful findings for clinical studies.

IS BRAIN AN ORGAN WITH "HIDDEN" LYMPHATIC FUNCTION?

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The opinion of missing brain lymphatic vessels was long lasting and brain with its blood brain barrier was thought to be a fortress-like domain. The most of literature offered the information that cells and molecules can enter the brain parenchyma but never go out. These opinions were supported by appearance of secondary brain tumors but no distant primary brain tumor metastases. Based on this we can make quite simple analogy with the mechanism of black holes in the space. Immune system anatomically includes lymphatic vessels which have their specific morphol-ogical hallmarks. Immunological processes in brain are unique in their features. Here we want to highlight and discuss the results of recent study of Louveau et al. published in May 2015, in Nature. The authors

submitted a comprehensive description of the layout and structure of functional intracranial lymphatic vessels lining main dural sinuses. Using immunohistochemical and fluorescence methods they revealed molecular and structural markers of lymphatic endothelial cells, mediation of cerebrospinal fluid flow and immune cells transport. These vascular structures were shown to carry material to the deep cervical lymph nodes. The paper suggests elucidation of function and tracing the lymphatic system in the brain. The results of discussed investigation are probably opening new ways in considerations of neuroinflammation, neuroimmunological disorders and metastatic mechanisms of primary brain tumors. We suppose it can bring deeper insight into development and significance of unique cellular and molecular composition of microenvironment in brain. The future research needs multidisciplinary approaches to this neuroimmunological subject.

ACCESSORY HEAD OF FLEXOR POLLICIS LONGUS: CASE REPORT AND REVIEW OF LITERATURE

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Introduction. Accessory head of flexor pollicis longus or Gantzer's muscle is a variation with clinical importance. This occasional head.or variant muscle belly is anatomical structure that can cause compression of anterior interosseous nerve. A wide range of incidence was reported by different studies. Material and methods. Left upper extremity region 68 year-old formalin-embalmed male cadaver was dissected for researching and educational purposes. Discussion on possible role of this variation in anterior interosseous syndrome and review of literature was performed. Results. An accessory head of flexor pollicis longus muscle has been observed unilaterally during the laboratory dissection of the forearm of a male cadaver. This accessory head was arised from the flexor digitorum superficialis and then was inserted into the flexor pollicis longus tendon. Conclusion. This anatomical variation is not much important because of its variation rate. It is interesting because variations such as the accessory heads have been implicated in the anterior interosseous syndrome.

REVERSED PALMARIS LONGUS MUSCLE: CASE REPORT

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Introduction. Palmaris longus originated from the medial epicondyle by the common tendon, and from adjacent intermuscular septa and deep fascia. This slender and fusiform muscle is located medially to the flexor carpi radialis. Then it converges on a long tendon located superficial to the flexor retinaculum. Small number of fibers joins to the transverse fibers of the retinaculum, but mainly the tendon passes distally. Completely absent palmaris longus is the most frequent anatomical variation. Other rare variations are reversed, duplicated, bifid or hypertrophied palmaris longus muscles. In this cadaveric case report rare muscle variation was reported where the tendinous structure of palmaris longus is proximally and muscular part was located distally. Material and methods. Left upper extremity region 71 year-old formalin-embalmed male cadaver was dissected for researching and educational purposes. Discussion on possible role of this variation in hand functions and clinical symptoms and review of literature was performed. Results. During the laboratory dissection of the forearm of a male cadaver reversed palmaris longus muscle was found unilaterally. Distal muscular belly and proximal tendon of palmaris longus muscle, opposite of the normal palmaris longus was observed. Conclusion. Palmaris longus often is used in plastic and reconstructive surgery mainly for tendon grafting and its variation should be kept in mind. Its variation is also important during other widely used procedures including lip augmentation, ptosis correction and in the management of facial paralysis. The overuse of the reversed palmaris longus muscle may lead to the muscle's local hypertrophy. According to the literature this variation may cause a compartment syndrome with pain and edema in the wrist's area, carpal tunnel syndrome and compression of ulnar nerve.

ACCESSORY TENDON OF THE FLEXOR POLLICIS LONGUS MUSCLE: CASE REPORT

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Introduction. Aberrant tendons of flexor pollicis longus (FPL) were "overlooked" in the operating room. Additional tendons in wrist can cause chronic inflammation, nerve compressions and tenosynovitis. Occurrence of its additional tendons of FPL in the carpal tunnel are rarely reported. Here we report an additional tendon of FPL inserted to metacarpophalangeal joint which can change index movements. Material & methods. Right upper extremity region 62 year-old formalin-embalmed male cadaver was dissected for researching and educational purposes. Results. During the laboratory dissection of the left forearm of a male cadaver it was observed that additional tendon originated from anterior surface of FPL in the forearm unilaterally. After passing wrist region distal insertion of this tendon is attached widely to the lateral surface of second metacarpophalangeal joint. It was observed that there are some ligamentous attachments to the proximal phalanx and can influence the index finger motion. Conclusion. Anomalous tendons of FPL having unusual mode of insertion. Awareness of anatomical variations in this region is important for surgeons during reconstructive surgeries of traumatized hand. Additionally in this case report flexion of index can cause holding and simultaneously cocking the hammer of a pistol. Previously studies in cadavers and in patients (Limburg Comstock anomaly) demonstrated the of anomalous tendon slips from the flexor pollicis longus to the flexor digitorum profundus from 25 to 31%. Interestingly in this cadaver case, direct insertion to the joint and its attachments to proximal phalanx demonstrates altering the movements of the index finger and second metacarpal bone.

