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WITH INTERNATIONAL PARTICIPATION
28 – 30 MAY 2021

ABSTRACTS

BULGARIAN ANATOMICAL SOCIETY

Journal of Biomedical and Clinical Research

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PLENARY LECTURES

SENTINEL LYMPH NODE BIOPSY WITH INDOCYANINE GREEN IN ENDOMETRIAL CANCER – CHALLENGES AND PERSPECTIVES

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The performance of lymph node dissection in early stage endometrial carcinoma is still under discussion. The aim of this study is to present preliminary data of sentinel lymph nodes identification after application of indocyanine green (ICG) in the cervix of patients with endometrial cancer.
Fourteen patients with histologically proven endometrial carcinoma T1 stage have undergone robot-assisted total hysterectomy. The lymph mapping was performed with the introduction of ICG and the assistance of da Vinci Firefly robotic technology. After detection of the lymph chains and regional sentinel nodes, biopsy have been performed, evaluated with frozen section.
Sentinel lymph nodes were detected in 13 (92%) patients, both-sided – in 8 (57%) and one-sided - in 5 (35%) of them. In only one case no sentinel lymph nodes have been visualized. Metastases in the lymph nodes were not detected in any of the patients.
The application of ICG for identification of sentinel nodes in early-stage endometrial cancer is safe and effective method for assessment of regional lymph node basin. However, additional data are required to assess its oncological significance.

MECHANISMS OF TEAR DRAINAGE – FUNCTIONAL AND CLINICAL ANATOMY OF THE EFFERENT LACRIMAL SYSTEM

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General knowledge of the anatomy and physiology of the nasolacrimal system and tear flow through the lacrimal passage is often inadequate and is usually not taught in anatomy classes. This lecture summarizes the function of tear transport from the ocular surface to the nose and provides new insights into the functional anatomy of the lacrimal system. In addition it also discuss the pathophysiology of the three major diseases of the lacrimal drainage system that clinicians face in their daily practice.

WHAT GUIDES T CELLS INTO THE BRAINS OF MULTIPLE SCLEROSIS PATIENTS?

Markus Kipp[1,2] *Newshan Behrangi*[1], *Jiangshan Zhan*[1] *and Hannes Kaddatz*[1]
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The loss of myelinating oligodendrocytes is a key characteristic of many neurological diseases, including Multiple Sclerosis (MS). On the pathological level, the MS lesions are characterized by recurrent episodes of inflammatory demyelination, likely driven by peripheral, autoreactive immune cells, which invade the central nervous system parenchyma and cause oligodendrocyte injury, myelin damage, and eventual destruction of neuronal elements. What triggers peripheral immune cell recruitment is currently unknown. Here, we used the cuprizone model to study the series of events and cell-cell communication pathways involved during MS lesion formation. By serial block face scanning electron microscopy studies we can demonstrate that metabolic injury of oligodendrocytes results in myelin blister formations and axonal swellings (i.e., blebs), paralleled by alterations of the node of Ranvier cytoarchitecture and impaired axon potential conduction. This degenerative process results in lymphocyte recruitment, predominantly $CD8^+$ cytotoxic lymphocytes along with high proliferation rates and cytotoxic granule expression, indicating an antigenic and pro-inflammatory milieu in the brains of cuprizone-intoxicated mice. The recently approved progressive MS drug Siponimod, a sphingosine-1 phosphat receptor modulator, ameliorates these pathologies presumably by directly protecting oligodendrocytes.
Overall, our studies provide strong evidence that metabolic oligodendrocyte injury is a key trigger for T cells to infiltrate the demyelinated central nervous system. We, thus, suggest that a brain-intrinsic degenerative process drives MS lesion formation. Understanding the underlying molecular events will pave the way for the development of novel therapeutic drugs.

CROSSING BOUNDARIES – ART AS A VEHICLE FOR INTERDISCIPLINARY LEARNING

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The science of anatomy and surgery is a relatively new concept that has evolved over the last couple of centuries. Artistic anatomy and surgery, however, have been in existence for over 2000 years. The separation of ‘science’ as a stream of critical analysis has had a profound effect on life as we know it. Every discipline has specialised and super-specialised leading to a great depth of knowledge in every sphere. The result, however, is the loss of the building blocks of inter-disciplinary engagement and above all, creativity. In this plenary lecture, Professor Vaiude, will explore how and why we must cross boundaries to regain the lost practice of collaborative learning and innovation to continue to drive progress across all disciplines.

NEUROANATOMY OF STRIATAL SPINY NEURONS WITH SENSORIMOTOR CUE

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We studied the expression of GABA-synthesizing enzyme isoforms GAD1 and GAD2 in olfactory bulb, cortex, medial and lateral striatum, hippocampus, and cerebellum of adult mouse. The GAD1 expression was significantly higher in the lateral compared to the medial striatum. The expression was culminating in the lateralmost part corresponding to the sensorimotor cortex. We collected expression data showing similar localized pattern. The spiny neurons expressing GAD1, an integral membrane protein GPR155 and CB1 revealed distinct distribution pattern over these subregions. The spiny neurons expressing GAD1, GAD2, GPR155 and CB1 were found to be more numerous in the calbindin-poor lateral striatum than the spiny neurons expressing other neuronal markers. The spiny neurons expressing GAD1, GPR155 and CB1 showed greater cellular intensity of expression in the lateral striatal region compared to the medial, central, dorsal, and ventral regions. On the other hand, the spiny neurons expressing GAD2, substance P, DRD1, DRD2 and PEnk1 were more homogeneously distributed in all striatal regions. We then analyzed co-expression of GAD1 and GPR155 in lateral striatal spiny neurons. Neurons stained for GPR155 were also immunopositive for GAD1. In the lateral striatum, neurons double stained for GPR155 and D1 receptors were frequently encountered. D1 receptor-expressing neurons were also immunopositive for DARPP-32. Cells double immunopositive for D2 receptor and GPR155 were very sparse. We then obtained expression data of other genes comparable to GAD1 and GPR155 types. Depletion of GPR155 showed interesting behavioral manifestations in mouse suggesting the lateral striatum's roles for sensorimotor events.

DO MAS-RELATED G PROTEIN-COUPLED RECEPTORS (MRGPRS) PLAY AN IMPORTANT ROLE IN THE PATHOGENESIS OF VISCERAL HYPERSENSITIVITY?

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About two decades ago, a novel family of Rhodopsin A-like G protein-coupled receptors was discovered in the mouse and human genome, the so-called Mas-related G protein receptors (Mrgprs). Mammalian Mrgprs are subdivided into 9 subfamilies: subfamilies D-G are evolutionarily conserved, subfamilies A, B, C and H are only found in rodents and subfamily X is specific to primates including humans. There is a clear functional orthology between murine and human Mrgprs. The majority of these Mrgprs are localized in dorsal root ganglion (DRG) neurons and/or in mast cells and are found to play an important role in the neurobiology of somatosensory nociception, including mechanical and thermal skin nociception and itch as well as pseudo-allergic drug reactions. More recently, we and others also found evidence for a role in the pathogenesis of visceral hypersensitivity for some of these Mrgpr subfamily members. In this talk I will give an overview of the current status of our knowledge, illustrating that Mrgprs might proof to be interesting novel targets for treating chronic abdominal pain in gastrointestinal disorders such as inflammatory bowel disease and irritable bowel syndrome.

WORKSHOP

CONVERSATIONS AND PRACTICE OF APPLIED ANATOMY TO CREATE AN ART INSTALLATION

Lead by: ***Prof Partha Vaiude, Prof Caroline Wilkinson & Mark Roughley***
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Each workshop will have 10 participants. Each delegate will be given a synthetic head and sculpting tools. They will have a live/pre-recorded demonstration of how to deconstruct the face back to "bone" along with reconstructive techniques. The process of deconstruction gives a unique perspective on the anatomy of the skull, working in 3D and the understanding of negative space – an important concept when learning the topography of a complex structure. Delegates will be given a variety of sculptural materials and anatomical resources (including cadaveric), training and artistic inspiration to help them deconstruct and then reconstruct a face, with a focus on the recreation of one key anatomical structure per delegate. All levels of students and professionals will have an opportunity to explore, learn and refine their understanding of the face; contributing their individuality in a unique journey culminating in an art instillation.
The objectives of the workshop are to:
- Explore facial anatomy from a new perspective
- Use sculptural techniques to deconstruct and reconstruct the face in 3D
- Network with a diverse group of people at different stages of their training/career
- Learn/refine facial anatomy (traditional, clinical and anthropological)
- Explore artistic perspectives of the face derived from different non-medical disciplines
- Make a lasting contribution to the University of Pleven Anatomy-Art Installation

It is envisaged that the workshop will act as a stimulus to initiate collaborations and lasting relationships that bridge medical sciences and art. NB: This 75 minute workshop can be delivered up to 3 times during the congress. Each workshop can hold 10 delegates.

ANATOMICAL VARIATIONS

ORAL PRESENATIONS

A VARIATION IN LATERAL ANTEBRACHIAL CUTANEOUS NERVE

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The dorsal surface of the hand has complex cutaneous innervation. The superficial branch of radial nerve ramifies in the skin of the dorsolateral aspect of radial three and a half digits, approximately to the level of the distal interphalangeal joint. The ulnar side of the skin is innervated by the dorsal branch of ulnar nerve, while the tips of the fingers are innervated by the median nerve. Variations in the cutaneous innervation of the hand are described in the literature.

During routine dissection course on upper limb we observed 12 extremities in formalinfixed cadavers. We found unilateral anatomical variation of lateral antebrachial cutaneous nerve in one cadaver.

During routine dissection of the forearm, aberrant lateral antebrachial cutaneous nerve was observed reaching the dorsal aspect of thumb, second and third digit. Variation in cutaneous innervation of the hand has been reported by different authors and with different frequencies (2-10%) in the literature. Knowing such variations and taking them into account during surgical procedures is of extreme importance.

Variations in innervation are often observed in cadavers and patients. Knowledge of different patterns could be essential for achieving optimal results in clinical practice.

KEY WORDS: lateral antebrachial cutaneous nerve, variation, skin innervation

ANATOMICAL VARIATIONS IN THE PARANASAL SINUS REGION - A STUDY OF 100 PATIENTS

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The paranasal sinus region is one of the most variable part of human body. It has a significant role during the Functional Endoscopic Sinus Surgery for management of several paranasal sinus pathologies. Therefore, detailed knowledge of anatomical variations is critical for rhinologic surgeons because of the direct influence of variations over the pathological outcomes.

In our study, we reviewed CT scans and nasal endoscopies of 100 patients complaining of sinonasal disorders. We used Keros Classification for estimating the relationship between cribriform plate and the uncinate process. Gera Classification was applied for measuring the sloping level of ethmoidal roof relative to cribriform plate. We also present some case studies with different anatomical variations in the paranasal sinus region with their management from our perspective. Furthermore, we aim to highlight that to be in known of different anatomical variations, which may help the surgeon in his orientation during endoscopic sinus intervention.

KEY WORDS: paranasal sinus region; anatomical variations; functional endoscopic sinus surgery; sinonasal pathologies, Keros classification

BIPHALANGEAL FIFTH TOE IN THE ANATOMY STUDY OF THE MEDICAL STUDENTS

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It is known that normally the foot consists of three phalanges, however the literature showed that a large percentage of people have an anomaly with the 5-th toe containing two phalanges.
The main goal of our research is to identify how often could the medical students find this abnormal development during their two-year course of anatomy while making dissections or using the bone materials provided in the Department of Anatomy at the Faculty of Medicine at the Trakia University-Stara Zagora, Bulgaria.
The objects of our research were four corpses and two skeletons with fully preserved fifth toe.
The result of our study showed that three of the examined objects have a normal triphalangeal fifth toe (50%), two of them were biphalangeal (33%) and one was a case of symphalangism (17%).
The relatively high frequency (33%) of the described anomaly determines its significance and the real possibility to be observed during the educational process of medical students.
Moreover, this high percentage means that this variation of the normality should be shown to the medical students during their anatomy course.
KEY WORDS: phalanges, biphalangeal, triphalangeal, symphalangismsymphalangism

BLOOD SUPPLY AND INNERVATION OF SUBCUTANEOUS FAT DEPOTS IN THE RABBIT

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The subcutaneous adipose tissue in rabbits is formed in depots, the most prominent of which are interscapular and inguinal ones. The different sources of blood supply and innervation determined differences in their cellularity and intensity of growth.
Cadavers from six New Zealand White rabbits with 3.09 kg ± 0.03 body weight were used. The dissection of abdominal and thoracic cavity was followed by access to the aorta. The aorta was cannulated and in it aqueous mixture compound of gypsum, barium sulfate and colouring agent was introduced. For angiography of subcutaneous depots, roentgenography in laterolateral and dorsoventral recumbency was performed. After that, dissections of blood vessels and nerves in interscapular, inguinal regions were done.
The results from observations showed that interscapular depot was supplied by branches of occipital and thoracodorsal artery and drained in 11 pairs of veins, which flowed medially into an unpaired Sulzer vein. In interscapular depot, 11 pairs of nerves, branches of thoracic nerves were entered.
Inguinal depot was supplied and drained by branches and tributaries of a. and v. epigastrica caudalis et cranialis superficialis, as well as a. and v. circumflexa ilium profunda.
Innervation was performed by the lateral cutaneous branches of n. iliohypogastricus cranialis, n. iliohypogastricus caudalis, n. ilioinguinalis, r. femoralis of n. genitofemoralis and n. cutaneus femoris lateralis.
In this study is present simple and cheap method for observation of vessels both natively and by angiography. Specifics in blood supply and innervation are main reasons for differences in

fat depot metabolism.
KEY WORDS: subcutaneous fat, vessels, nerves, rabbit

CASE REPORT OF ABERRANT DORSALIS PEDIS ARTERY

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The aim of this article is to present the data of our case of a variation of the dorsalis pedis artery.
During a dissection course of a right foot of male gender, we came across a variation of the dorsalis pedis artery.
The dorsalis pedis artery is the main source of blood supply to the dorsum of the foot, distal from the talocrural joint. Usually, it is a direct continuation of the anterior tibial artery. In our case, the dorsalis pedis artery originated from the fibular artery, then it split into the first dorsal metatarsal artery and formed the dorsal arch.
The aberration was caused due to the insufficiency of the anterior tibial artery - it was shorter and thinner and got interrupted at the middle of the anterior crural region. For compensation, the peroneal artery elongated, supplied the anterior crural region where the anterior tibial artery couldn't and continued as the dorsalis pedis artery and its branching system.
Anatomical knowledge of the arterial system is important for the clinical practice, as practitioners require access to available sites for investigations, clinical examination and surgical operations. Palpation of peripheral arterial pulse, such as the pulse of the dorsalis pedis artery is commonly used as well to evaluate patients with arterial diseases.
KEY WORDS: dorsalis, pedis, anterior, tibial, artery

MORPHOMETRIC PARAMETERS OF LYMPHOID FORMATIONS OF THE VAGINAL IN WOMEN OF REPRODUCTIVE AGE

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The work aimed to analyze the morphological features of lymphoid formations of the vaginal vestibule in women of reproductive age in different phases of the ovarian-menstrual cycle.
Lymphoid formations of the vaginal vestibule in women of reproductive age are represented by diffuse lymphoid tissue and lymphoid nodules.
We found that the size-quantitative indicators of lymphoid formations on the vaginal vestibule change significantly during the ovarian-menstrual cycle. So, in the phase of secretion, the proportion of lymphoid nodules containing the germinal center is greater than in the phase of proliferation (1.20 times, $P < 0.05$) and desquamation (1.30 times, $P < 0.05$). In the secretory phase, the area and length of the lymphoid nodule in the walls of the vaginal vestibule is greater than in the proliferation phase (1.10 times, $P > 0.05$ and 1.20 times, $P < 0.05$, respectively) and in the desquamation phase (1.10 times, $P < 0.05$).
The density of cells in the composition of diffuse lymphoid tissue in the secretion phase is greater than in the proliferative (1.20 times $P < 0.05$) and desquamation (1.40 times $P < 0.05$)
phases.
Morphometric indicators of small lymphoid formations in the phase of secretion of the ovarian-menstrual cycle increase, in the phase of desquamation these indicators are minimal, and in the proliferative phase they occupy an intermediate position.
KEY WORDS: lymphoid formations, morphometric paramete, vaginal vestibule

PREINTERPARIETAL AND INTERPARIETAL BONES ON ARTIFICIALLY DEFORMED SKULLS

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The study aimed at the occurrence of the preinterparietal and interparietal bones on artificially deformed 13 skulls.
The frequency of deformations was as follows: bifronto-occipital-6 (46.2%; the preinterparietal bone was found in one case (16.7%), but no interparietal bone was found), fronto-parieto-occipital - 3 (23.1%; the preinterparietal bone was found in one case (33.3%), the interparietal bone was absent), parallelo-fronto-occipital - 2 (15.4%; preinterparietal bone was found in one case (50.0%), interparietal bone was also not found), parallelo-fronto-occipital, subtype-saddle-like depression – 2 (15.4%; the preinterparietal bone was not found, and interparietal bone was found in one case (50.0%)). For the preinterparietal bone $\chi^2 = 1.733$; $p = 0.630$, and for the interparietal bone $\chi^2 = 5.958$; $p = 0.114$. Metopic suture was found in parallelo-fronto-occipital deformation in one case (50.0%) and in parallelo-fronto-occipital, subtype-saddle-like depression deformation also in one case (50.0%) ($\chi^2 = 5.318$; $p = 0.150$). Preinterparietal bone was found with a metopic suture on one skull (50.0%), on the other two skulls it was found without a metopic suture (18.2%) ($\chi^2 = 0.965$; $p = 0.326$). Interparietal bone was not found on artificially deformed skulls with metopic suture.
The preinterparietal bones in artificially deformed skulls are somewhat more common and coincide with the metopic suture than the interparietal bones.
KEY WORDS: preinterparietal bones, interparietal bones, artificially deformed skulls

VARIATIONS IN THE BRANCHING PATTERN OF AXILLARY ARTERY

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The axillary artery is divided into three parts by its relation to pectoralis minor muscle.
Posterior circumflex humeral artery originates arise from the third part. Deep brachial artery usually branches from the proximal part of the brachial artery, just below the teres major muscle.
We present a case where the axillary artery passed normally between the medial and lateral roots of the median nerve and after that it give raise to a large arterial trunk that bifurcate into deep brachial artery and posterior circumflex humeral artery.
During routine dissection course on upper limb we observed 12 extremities in formalinfixed cadavers. We found unilateral anatomical variation of deep brachial artery and posterior circumflex humeral artery in one cadaver.
During a regular dissection of upper extremity unilateral anomalous vessel was observed in the third part of the axillary artery – a 3 cm long trunk, bifurcating into posterior circumflex humeral artery and deep brachial artery with similar diameter. Variations in the origin of the major arterial trunks have been reported with an incidence of over 20% in the literature.
Knowledge of different branching patterns is important for good clinical practice.
Arterial origin abnormalities appear often and have their clinical importance especially in angiography procedures.
KEY WORDS: axillary artery, variation, posterior circumflex humeral artery, deep brachial artery

ELECTRONIC POSTERS

THE TOPOGRAPHY FEATURES OF THE SUPERIOR ORBITAL FISSURE IN NEWBORNS AND ADOLESCENTS

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The aim of this work was to study the craniometric of the skull and topography of the superior orbital fissure. The superior orbital fissure that forms between the lesser and greater wnigs of the sphenoid bone, serves as a passage for the superior orbital vein, oculaomotor, trochlear and abducent nerves and ophthalmic branch of the trigeminal nerve. It is of essential interest for plastic face surgery and besides it is important for the topography anatomy.

Investigation material has been 70 skulls (30 newborns,40 adolescents) from both sex, part of the museum collection of the department of human anatomy and medical terminology of the Azerbaijan Medical University.

In this work ware used following methods: cranioscopic, roentgenology and cutting the skull by Pirogovs way.

At newborns the superior orbital fissure is wider, at adolescents the width is decreased. Right superior orbital fissure settles in comparsion to the left superior orbital fissure medially and backward and is localized higher above auriculoorbital horizontal.

In conclusion, in childhood superior orbital fissure doesn't grow in width, bit it is the determinate height increases and reaches sizes at age of 13-16 years.

KEY WORDS: superior orbital fissure

THE AGE VARIABILITY OF THE LENGTH OF THE INITIAL PART OF THE GLANDS OF HUMAN PHARYNX

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Diseases of the pharynx occupy an important place among diseases of the digestive and respiratory systems. The purpose of the study was to determine the age variability of the length of the initial part of the glands of human pharynx from an age perspective. We used Sinelikov's method. After staining glands with a solution of methylene blue, we analyzed the age variability with the stereomicroscope MBS – 9. Our results show that in the upper third of the pharynx comparatively with newborns the length of the initial part of the glands increases in early childhood 1.2 times and in adolescents 3.3 times. In the first period of adulthood the indicator peaks at 3.7 times higher than in newborns. In the middle third of the pharynx, as compared to newborns, the length of the first part increases in early childhood 1.3 times, in adolescence 3.2 times. In the first period of adulthood, the peak increases 3.9 times. In the lower third of the wall of the pharynx, compared to newborns, the length of the initial part of the glands increases 1.5 times in early childhood, 3.8 times for adolescents and 4.2 times for the first period of adulthood.

By comparison with adulthood, the parameter in elderly age decreases 1.2 times and in senile age 1.3 times. In the whole pharynx, the length of the initial part of the glands, compared to the newborns, increases at early childhood 1.4 times, in adolescence 3.6 times, in the first period of adulthood 4.1 times.

KEY WORDS: glands of human pharynx, age variability

RARE ANATOMIC VARIATION OF THE UPPER LIMB BLOOD SUPPLY: CASE REPORT AND LITERATURE REVIEW

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Variations in vasculature of the upper extremity are fairly common and have been extensively studied throughout the years. Most of them represent singular variants. Here we present a case of rare, multiple, simultaneously occurring variations in a single limb.

During standard anatomical dissection of an upper extremity, multiple variations of vasculature were noted. Presence of a brachial artery with two main arterial stems was noted, with the superficial branch giving two main forearm arteries - a. radialis and a. medioulnaris – and the deep branch continuing in the forearm as the common interosseous artery. Furthermore, an open superficial palmar arch was discovered, with two common palmar digital arteries originating from a. radialis, and the other two from a. ulnaris (a. medioulnaris).

Varying terminology and the lack of a general classification made comparing data difficult. Similar variations were noted in different studies but terminology used was not always consistent. To avoid confusion by using the term "deep brachial artery", we propose the deep brachial branch in the arm to be called the deep proper brachial artery. Furthermore the term superficial brachial artery was found to lack specificity and the term brachioulnoradial artery was noted as appropriate in our presented case.

To our knowledge, this is the first case report presenting these exact variations simultaneously in a single limb. Larger scale trials are still needed to determine the frequency of similar, multiple variations and to revise and improve existing classifications and terminology.

KEY WORDS: deep proper brachial artery (DPBA); superficial brachial artery (SBA); superficial brachioulnoradial artery; incomplete arcus palmaris superficialis;

OBSERVATION OF CASES OF CORONA MORTIS IN CADAVER MATERIAL IN THE ANATOMY DEPARTMENT, MEDICAL UNIVERSITY OF PLEVEN

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The purpose of this article is to present the results of our study of corona mortis, its anatomical variations and clinical importance.

During the routine dissection course we examined 2 cadavers and 30 lower limbs. The study is based on a research that took place in the department of anatomy of the Medical university of Pleven between September 2019 and June 2021.

We found 14 cases of corona mortis from 34 lower limbs. This constitutes 43% corona mortis rate, while the rate of corona mortis-free cases constitute 57%. From these 14 corona mortis cases, we found 6 arterial (44%), 4 venous (28%) and 4 mixed (28%).

Corona mortis in Latin means "crown of death". It signifies the importance of this feature as a hemorrhage could occur if cut accidentally, because a following haemostasis is difficult to achieve which might result in lethality of the patient, who is undergoing surgical treatment.

When present, the corona mortis can be injured when a surgeon looks to enlarge the femoral ring by opening the lacunar ligament from the anterior aspect. In this approach the "corona mortis" is not visible, as it is found immediately posterior to the lacunar ligament. This vascular structure

could even be endangered in a laparoscopic procedure for inguinal of femoral hernia repair.
KEY WORDS: corona mortis, a. epigastrica inferior, a. obturatoria

HUMAN FETAL HEART AND ITS ATRIOVENTRICULAR ANNULI: NORMAL DIMENSIONS AND CORRELATIONS

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Morphometric criteria of normal human fetal heart and cardiac fibrous skeleton are highly valued in prenatal diagnostics and fetal surgery. This study was aimed to reveal such criteria.
In 148 10%-formol-fixed specimens, by the caliper we delineated heart length, width, thickness and length of ventricular complex. We calculated ventricular complex index as a ratio of heart width to length of ventricular complex and transverse-longitudinal index as a ratio of heart width to heart length. By means microsurgical instruments, we dissected fibrous skeleton in 10 hearts. Using microscope Olympus CS, Toupcam 5.1MP, and ToupView 3.5, we measured atrioventricular fibrous annuli. The heart length was 24,9±8,26mm, length of ventricular complex 19,4±6,71mm, heart width 17,6±6,96 mm, heart thickness 13,1±4,84.
We found correlation between heart length and width (R=0,94), between heart width and length of ventricular complex (R=0,96), between heart width and thickness (R=0,95).
Perimeter of the left and right annuli were 24,6±4,28mm and 28,1±6,75mm, areas of the left and right annuli were 45,5±16,9mm2 and 56,2 ±23,73mm2. According to "longest/shortest diameter", we distinguished the round (<1,4) and oval annulus (≧1,4). We found correlation between heart width, left (R1) and right (R2) annulus area (R1=0,88, R2=0,9), between the length of ventricular complex, left and right annulus area (R3=0,86, R4=0,86). External heart sizes showed a concordance in growth. Parameters of the fibrous annuli are in accordance with the external sizes. The relationships which have been discovered are believed us to be criteria of normality for human fetal heart.
KEY WORDS: fetal heart, morphometry, fibrous annulus

COMMUNICATION BETWEEN MEDIAN NERVE AND MUSCULOCUTANEOUS NERVE: A CASE REPORT

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Variations of the brachial plexus are frequently observed. One of the most common variants is a communication between the median nerve (MN) and the musculocutaneous nerve (MCN). Such communications have been classified multiple times and are an object of discussion due to their clinical significance. Even though there is a dispute regarding the origin of these variations it is now clear that such communication consists of nerve fibers whose final distribution is in the innervation zone of the median nerve. The clinical significance of such variation is to be considered both in the surgical and clinical setting.
Communication between the median and musculocutaneous nerve was observed during routine dissection of the upper limb of a formalin-fixed male cadaver. It was located in the middle of the arm, approximately 16sm distal to the entrance of the musculocutaneous nerve in the coracobrachialis muscle. The communication was 4cm long and passed above the brachial artery to join the medial nerve diagonal fashion.
Communications between median and musculocutaneous nerves are a common finding during anatomical dissections and surgical procedures. The latter are considered to be consisting of nerve fibers of the median nerve,

which pass through the musculocutaneous nerve and finally join the median nerve through the communication. Though vice versa variants have been reported, they are rather rarer finding. The frequency of these variants is reported to range between 1.4% -41.5%. The predominantly used classification was suggested by Le Minor (1992), who classified them into five types. The communication we encountered is classified as Type II. Later on, other classifications were presented by Veinreratos and Anagnostopolou (1988), Choi et al (2002), Loukas & Aqueelah (2005), Guerri-Guttenberg (2009), Maeda et al. (2009), Hayashi et al. (2017). The origin of the variant has been mostly attributed to disturbance of the embryological process of the formation of the brachial plexus. Yet comparative anatomy studies suggest a phylogenetic basis of the communication and consider it a developmental anomaly. Regardless of the abovementioned theories, the clinical significance is out of any discussion, as it is obvious that such anastomosis could significantly complicate surgical procedures. Apart from surgery, the variant distribution of median nerve fibers into the musculocutaneous nerve can be the reason for the atypical clinical presentation of entrapment syndromes as well as in neurophysiological examinations.

Therefore, it is clear that knowledge of such variations is important for clinicians as well as surgeons. The variant is yet to be classified in a more exhaustive, yet practical manner and the ontogeny is to be clarified as well. Additional studies are mandatory for a more detailed understanding of the clinical presentation of such variants.

KEYWORDS: median nerve, musculocutaneous nerve, communication, anatomical variation

AN INTERESTING CASE OF A RARE ANATOMICAL ANOMALY - BIPARIETAL OSTEODYSTROPHY

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Biparietal osteodystrophy is a rare anomaly with a progressive course, characterized by a varying in degree thinning of the parietal bone in the region between the obelion and the temporal line.

Commonly it presents bilaterally and idiopathically, mostly in women and in the elderly population. The decrease in bone thickness is at the expense of the external lamina and the diploë. There is an absence of inflammation, surplus of osteoblasts and osteoclasts, and malignant transformation at the point of thinning. It is presumed, that this condition owes to decreased osteogenesis at the affected area due to the decreased secretion of sex hormones, which would explain why women are more affected, and why the osteodystrophy presents quite late. Another hypothesis includes disturbed blood-flow in the terminal branches of the external carotid artery. Cederlund et al. propose a classification of the condition depending on the degree of thinning. Presented is a case of biparietal osteodystrophy, found during an examination of bones in the ossuary of the Department of Anatomy, histology and embryology in the Department of Medicine of Plovdiv Medical University. Its characteristics comply with the current ideas for this condition. The recent establishment of the histological premises for biparietal osteodystrophy marks the overall progress in the understanding of the disturbances in bone development.

KEY WORDS: a. lusoria, aberrant a. subclavia dextra, diverticulum of Kommerell, dysphagia lusoria

AN ANATOMICAL OBSERVATION OF THE LEFT ATRIAL ANATOMY

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The study was aimed to explore normal left atrium (LA) anatomy in adults of 35–80 years old died from non-cardiac causes (N=120). We made silicone casts (n1=35). By means the digital caliper, measured LA appendages (n2=20), and viewed the LA walls by means digital endoscopic tools assisted with transillumination (n3=65). The median and Spearman correlations (r) were calculated. LA length was 42.3 mm (ranged 31.4 to 65.8 mm), width was 50.3mm (35–70mm), maximum sagittal size was 43.8mm (30–57.4mm). We revealed the close correlations between the LA parameters as well as between those and heart length and width (r>.4). In silicon casts, we found to be the "classical" four-mouth pattern of pulmonary vein drainages in 88% of specimens. As for LA appendages, their variability in shape fundamentally came to the number and direction of lobes. Commonly, the left atrial appendage consisted from three lobes laid in the same horizontal axis (45%) and two lobes with the distal lobe looked downward (30%). The length of the LA appendage was 10.4mm (6.4–15.3mm). By endoscopic transillumination, we delineated thin muscleless and hypomuscular areas in the LA walls. Predominantly, those areas were developed to be near the LA appendage orifice, in the left half of the LA roof, at the junction of the LA anterior wall and the interatrial septum. The areas in those locations appeared us rather normal anatomical variance than tissue-deficient abnormality. Nevertheless, the thin areas should be viewed as operational risk areas in catheter ablation and LA appendage occlusion

KEY WORDS: anatomy, left atrium, heart.

AGE CHARACTERISTICS OF MORPHOMETRIC PARAMETERS OF BONE PALATE

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The purpose of the work was to study the age characteristics of morphometric parameters of bone palate.

The results of the study showed that the average of the length bone palate in first adult age was 47.6 ± 1.1 mm, and in old age it was 40.2 ± 0.6 mm. The width of the bone palate at the level of canine teeth, during first adult age is 26.4 ± 0.6 mm, and in the old age it is 23.6 ± 0.5 mm. The value of this indicator at the level of the second premolar tooth was 37.7 ± 0.6 mm during first adult age, and in old age 32.9 ± 0.6 mm, and near the second molar tooth is 46.3 ± 0.6 mm in the first adult age, and 42.0 ± 0.6 mm in the old age, respectively.

In the first adult age, the distance between the incisive foramen and greater palatine foramens are 44.4 ± 0.6 mm on the right, 44.1 ± 0.5 mm on the left, and in the old age, 39.0 ± 0.6 mm and 39, 6 ± 0.6 mm respectively. The distance between the greater palatine foramens in the first adult age is 31.7 ± 0.4 mm, and old age 27.5 ± 0.5 mm.

Results showed once again that the morphometric parameters of the bony palate have significant age characteristics.

KEY WORDS: bone palate, age, teeth

VARIATIONS IN THYROID GLAND ARTERIAL BLOOD SUPPLY AND THEIR CLINICAL IMPLICATIONS

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Though the variations of the vessels are most common in humans, the inferior thyroid artery (ITA) arises from the thyrocervical trunk in 90.5%, subclavian in 7.5%, and very rarely from the common carotid, aortic arch, brachiocephalic, internal thoracic, pericardiacophrenic, or vertebral, or arises as a common stem with the contralateral inferior thyroid. Two cadavers dissected in the anatomy department are presented with variations in the blood supply of the thyroid gland. The first case was a 61-year-old man with middle thymothyroid artery arising from the common carotid artery (CCA) on the right side and ITA as a branch of CCA on the left. The second case was an 85-year-old female without ITA bilaterally, replaced by thyroid ima arising from brachiocephalic artery. Anatomical description, clinical importance and a short interpretation on the developmental aspects of the variations are discussed.
KEY WORDS: human anatomy variations, inferior thyroid artery, thyroid ima

A. SUBCLAVIA DEXTRA LUSORIA (ABERRANT RIGHT SUBCLAVIAN ARTERY) – DEMONSTRATION OF A RARE DISSECTING FINDING

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The normal three branches of the aortic arch are the brachiocephalic trunk, left common carotid artery and left subclavian artery. Some variations of the aortic arch branches are known. One very rare variation is presence of the fourth branch – a. subclavia dextra arising from the distal part of the aortic arch or proximal part of descending aorta behind the left subclavian artery.
During routine dissection a male cadaver was noted to have an unusual branching pattern of the aortic arch with four branches: a. carotis communis dex., a. carotis communis sin., a subclavia sin. and a. subclavia dex. The aberrant right subclavian artery is very rare – about 0.1% of cases.
In our case it arised from a dilated segment of the proximal descending aorta, the so-called Diverticulum of Kommerell. The artery was traveling behind the trachea and the esophagus to reach the right side.
A right non-recurrent laryngeal nerve was observed arising from the right vagus nerve 3 cm up to the right subclavian artery. Left recurrent laryngeal nerve looped normally around the aortic arch. No other variations were observed in the branching pattern and distribution of the other great vessels. Possible pathological manifestations due to this rare variation are discussed.
KEY WORDS: a. lusoria, aberrant a. subclavia dextra, diverticulum of Kommerell, dysphagia lusoria

A CASE OF MULTIPYRAMIDAL KIDNEYS WITH SMOOTH SURFACE IN A NEW ZEALAND WHITE RABBIT

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The focus of the present study was to present a case of multilobar kidneys with smooth surface in one New Zealand white rabbit. It is well known that the kidneys of the rabbits are unipyramidal. During dissection it was found that there was an exception in one female animal which was clinically healthy and sexually matured, aged 8 months and with weight from 2.5 kg to 3.2 kg. After evisceration of both kidneys, and incision in the lateral borer of the fresh organs, it was found that the cortex and medulla were constructed by pyramidal shaped lobes. The apex of the lobes formed papillae and got up into calices into the real sinus.
The renal pelvis was a concave structure. We conducted an imaging anatomical study. The anatomical preparations were studied in liquid isotonic medium, using ultrasound device with linear transducer. Thus we confirmed the results with these of the organs' morphological features. The cortex with the fibrous capsule were hyperechoic, compared to the relatively hypoechoic image of the pyramidal lobes. The papillae forming the apex were outlined by the hyperechoic calices. The renal pelvis and hilus were hypoechoic findings. After fixation the kidneys in 10 % water solution of formalin the pyramidal shaped lobes were preserved and with well distinguished papillae. The calices protruded into the sinus. In all methods we found seven number of well-defined pyramidal shaped lobes.
KEY WORDS: rabbit anatomy, kidney, imaging

AN ANATOMICAL STUDY OF THE PONTICULUS POSTICUS OF DRY BONE SPECIMENS IN THE ANATOMY DEPARTMENT OF MEDICAL UNIVERSITY - PLEVEN: A CASE REPORT

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The first cervical vertebra, also known as atlas, is an integral component of the craniocervical junction acting as a transitional structure between the occipital bone and the cervical spine. It is in close relations with the vertebral artery and the suboccipital nerve which lie on its posterior arch. The ponticulus posticus (posterior ponticle) is a complete or incomplete bony bridge extending from the lateral mass to the posterior arch of the atlas. It is thought to arise from ossification of the posterior atlanto-occipital membrane and is considered as a common anatomical variation among human individuals ranging from 7,6%-24,7% in different populations. The posterior ponticle, together with the posterior arch, enclose the arcuate foramen of CI which is reported to have protective role for the vertebral artery in its complete form. Nevertheless, it has also been associated with symptoms like headache, vertigo, shoulder-arm pain, vertebrobasilar strokes. The foramen arcuatum is reported to exist in adolescents and it appears that its presence is not related to age or ethnicity.
The objective of this study is to describe the

structure, variations and incidence of the ponticulus posticus on dry bone specimens of atlases in the Anatomy department of Medical University of Pleven and highlight this common and often underestimated anatomical variation. We collected and observed 83 atlases available for use in the department bone setting. Complete arcuate foramen was found in 8,43% and an incomplete was found of 16,87% of the specimens. These results correlate with similar reports from the literature.

KEY WORDS: atlas, foramen arcuatum, vertebral artery, ossification, atlanto-occipital membrane

ANATOMY EDUCATION AND TRAINING

ORAL PRESENTATIONS

EXPERIENCE OF USING VIRTUAL REALITY AND INTERACTIVE TECHNOLOGIES IN TEACHING TOPOGRAPHIC ANATOMY IN A DISTANCE LEARNING ENVIRONMENT

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For the implementation of distance learning, we decided to create cross-use of educational platforms, which are marked by a high involvement of students. Therefore, a community was created on the Vkontakte social network, regularly updated with short (up to 15 minutes) video lectures on the topic of the semester and a server on the Discord platform. Thanks to the dynamic approach in the mode of video conferencing and the use of a social network in which, after online seminars, clinical cases and tasks that were open to discussion were published, the students retained a fairly high level of motivation. The department has created a laboratory of virtual and augmented reality, where classes are held, incl. BEFORE via broadcast using VR helmets. At the same time, the teacher is actively inside the virtual environment (in our case, it is a realistic anatomical class with macro- and micropreparations), and the students are connected remotely.

The obtained information allowed us to optimize e-learning in autumn: for example, one of the key elements of the restructuring of presentations was the prevalence of images over text or its complete exclusion (as opposed to the rule of 25% of the text on a slide). most use small screen gadgets. In addition, in the current semester, we connected an Instagram account (@osta_sechenov), where in the story mode we invited students to participate in surveys and solving situational problems.

KEY WORDS: e-learning, VR, social network, education

SOME REMARKS IN THE USE OF LATIN NEUTER GENDER IN ANATOMICAL CONTEXT AND DIDACTIC WAYS TO IMPROVE THE TEACHING METHODS

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The present content aims to map some common uses of the neuter gender in Latin language in the context of anatomical knowledge and human body topography. The grammatical rules about the specific uses of the neuter gender are basic for the descriptive combinations of words in the language of anatomy. The grammatical orientation in teaching methods of students is basic and primary from didactic perspective but the specific methods of mastering this content require some new approaches for adopting and facilitating the process of memorizing and

understanding. This work is trying to suggest some possible ways to improve the learning process of specific content in anatomical terminology. The first step proposed for linguistic teaching is outlining the diversity of case endings and identical forms in idioms from different genders. The second step is the parallel understanding of meanings in both languages "Latin-Bulgarian" or "Latin-English". For the specific use of the neuter forms in Latin the content is illustrated with multiple examples and transformations which are used in training students, mainly beginners in Latin and Anatomy as a basic discipline in medical education.

KEY WORDS: Latin terminology, learning content, Latin language

STUDENT OPINION ABOUT THE ONLINE EDUCATION IN THE PRACTICAL EXERCISES OF ANATOMY

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Of the 104 surveys sent for voluntary, anonymous completion, we received 75 responses.
According to 78%, there is a difference between face-to-face and online exercises. More than 80% find greater practical value in the face-to-face exercises and 86.7% find the present exercises equally or more pleasant. Less than half find online exercises more convenient.
About 77% think that the present exercises are more useful and 49% do not find a difference in their assessments between the two types of conduct. More than 60% had technical or computer problems, 63% answered that their workstation is not ergonomic and 64% had fatigue of the nervous system and locomotory system. Present attendance and online exercises are a completely different type of training. There is not enough understanding of the difference and there is a need to explain it. The practice is expected to developing habits and skills that are lost in online work. Attendance is more enjoyable for students. Online conducting is as convenient as attending and the evaluation is equally objective.

KEY WORDS: student opinion, online education, anatomy

THE TRANSITION FROM CONVENTIONAL TO DIGITAL SLIDES (VIRTUAL MICROSCOPY) IN PATHOLOGY LAB CLASSES IN THE CONTEXT OF COVID-19 PANDEMIC: THE STUDENTS' POINT OF VIEW.

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Although the application of digital pathology for teaching purposes is widely accepted, the abrupt change from conventional slides to digital slides and its implementation in practice from the students' point of view is not well studied.
The aim of the following study was to evaluate the students' opinion on an abrupt transition from conventional slides to virtual microscopy in pathology lab classes in the context of COVID-19 pandemic.
The slides for all lab classes in pathology were digitalized using the infrastructure of the "Center of competence ", Medical University- Pleven. Digital slides were implemented in an on-line database and used parallel with routine slides for two classes and then only virtual microscopy

(digital slides) were used for teaching in distance education classes. The opinion and experience of 52 students was assessed using short questionary, three weeks later.
The median age of the questioned students was 20 years (19-28). Female were 33 and male were19 of the enquired students. Digital slides are very good or excellent substitution of routine slides according to 38 (73,07%) students; 6 (11,54%) students consider them good enough; 6 (11,54%) consider them as suboptimal and 2 (3,85%) have no opinion. Virtual microscopy should be kept after the end of COVID-19 crisis according to 49 (94,23%) students.
Virtual microscopy is suitable for implementation and use for pathology classes with no significant need of "how to use" training.
KEY WORDS: conventional microscopy, virtual microscopy, lab classes, students' point of view.

'VISUALEYES' A PORTAL FOR INTERACTIVE LEARNING IN MEDICINE A SAMPLE OF OPHTHALMOLOGY

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In the current climate of education in medicine, students find themselves in a peculiar learning environment. The staple of the old school education methods of in-person teaching and learning has been limited, and in some cases, it is interrupted.
The traditional anatomy education based on topographical structural anatomy taught by didactic lectures and complete dissection of the body with personal tuition, nowadays this has been replaced by a multiple ranges of special study modules, problem -based workshops, computers, plastic models, and many other teaching tools. Therefore, there is an increasing interest in developing virtual educational resources to improve students' understanding for better education and training.
The aim of our study is to develop an online portal for anatomy of the eye and to form a framework to develop more disciplines in education. We describe a novel design of a virtual learning portal with the guidance of respected department members which involves a multimodal curriculum including descriptive anatomical images of the eye, dissections, videos, quizzes that are efficient and can provide self-directed adult learning environments affording students more control over their own learning.
A vast majority of studies on e-learning resources have shown a positive response to learning anatomy. Moreover, according to students' feedback, it is found that it contributed to a better learning environment and improvements in their academic performance.
The positive initial results of these studies on the versatile virtual learning portals have encouraged us to think about the possibility of implementing e-learning portal to Medical University Pleven.
We think that e- learning can have a positive impact on students' academic capabilities. These innovative approaches can revolutionize medical education, which can motivate other departments as well to become a part of such initiatives.
KEY WORDS: VisualEyes, anatomy, e-learning, self-learning, portal, ophthalmology

ANTHROPOLOGICAL ANALYSIS OF SKULLS IN THE DEPARTMENT OF ANATOMY, STARA ZAGORA

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The aim of this study is to evaluate the anthropological differences of the preparates form sculls used in the education process in the Department of Anatomy, Trakia University, Stara Zagora, Bulgaria, and to train the medicine students in anthropological analysis of human remains. After the construction of a protocol for the evaluation, 24 sculls were measured and gender, age and race were noted. Most were European, age between 35- 70 years and half were male and the other half-female.

KEY WORDS: anthropology, scull, anatomy

ELECTRONIC POSTER

SIMULATED 3D MODEL OF THE MIDDLE EAR FOR THEORETICAL AND PRACTICAL TRAINING FOR STUDENTS, POST-GRADUATE ENT DISEASES STUDENTS AND BEGINNING OTOSURGEONS

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Post-graduate ENT diseases students and beginning otosurgeons go through a very important initial training period. The first steps in otosurgery are taken step by step. The transition from theoretical knowledge to temporal bone dissection courses is long and difficult. The lack of preliminary preparation vitiates and increases the cost of temporal bone dissection exercises.
Simulated models bridge the gap between theory and practice and contribute to a more effective training.
Developing a simulated 3D model of the mastoid process in real size and the part of the facial nerve passing through it; using a simulated 3D model of mastoid process for anatomical visualization of the hard to find and invisible structures of the middle ear and facial nerve and for nosological training.
1. Cadaver temporal bone on which postauricular facial nerve decompression has been performed.
2. Elaborating a silicone model based on a print taken from the operative cavity
4. 3D printing of the models and colouring
5. Putting electrical conductors and their connection to a tactile pointer and light indicators
The model:
- presents the hard to find and invisible microstructures of the middle ear and the part of the facial nerve passing through it
- allows work in two modes: anatomical and nosological
- contributes to more lasting preservation of knowledge, using the principle of active learning and training visual and tactile memory.
The model is developed for tuition, precedes training models and can be improved.

KEY WORDS: temporal bone dissection, temporal bone simulation.

CELLULAR AND MOLECULAR ANATOMY

ORAL PRESENTATIONS

MICROBEAM RADIATION AS A PROMISING APPROACH FOR TREATMENT OF RADIORESISTANT TUMORS

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Microbeam Radiation Therapy (MRT) is an innovative approach in radiation oncology where a collimator subdivides the homogeneous radiation field into an array of co-planar, high-dose beams which are tens of micrometres wide and separated by a few hundred micrometres. MRT significantly improves local tumour

control with minimal normal tissue toxicity in different preclinical models. One of the biggest challenges in translating MRT to the clinic is its use of high peak doses, of around 300-600 Gy, which can currently only be delivered by synchrotron facilities. Therefore, in an effort to improve the translation of MRT to the clinic, this work studied the therapeutic index of temporal fractionation and combined treatment strategies using clinically relevant doses.

C57Bl/6J female mice harboring B16-F10 melanomas in their ears were treated with (i) a single MRT session of 400 Gy peak dose or (ii) three MRT sessions of 133 Gy peak dose delivered over 3 days in different anatomical planes (iii) low dose MRT in combination with cytostatic drugs and nano-gold.

Temporally fractionated MRT (3 x 133 Gy) ablated 50% of B16-F10 mouse melanomas, preventing organ metastases and local tumour recurrence for 18 months. In the rest of the animals, the median survival increased by 2.5-fold in comparison to the single MRT session and by 4.1-fold with respect to untreated mice.

MRT at 150 Gy in combination with cytostatic drugs and nano-gold increased the median survival by more than 2 -fold in comparison in comparison to the single MRT session and by 6.6-fold with respect to untreated mice.

Temporally fractionating MRT and low dose MRT in combination with cytostatic drugs and nano-gold increased significantly the efficacy of MRT even in case of radioresistant melanoma reaching the best reported treatment index of complete tumor remission in 50% of the animals. These results demonstrate that the solution to making MRT more clinically feasible to irradiate with several fractions of intersecting arrays with lower peak doses or apply combined treatment strategies. This provides alternatives to synchrotron sources where future microbeam radiotherapy could be delivered with less intense radiation sources.

KEY WORDS: chemotherapy; combined treatment; nano-gold; macrophages; melanoma; melanophages; mouse; spatial fractionated radiotherapy; synchrotron microbeam radiation therapy; temporal fractionation.

ENOS EXPRESSION IN THE WISTAR RAT KIDNEY AFTER SELECTIVE BLOCKADE OF ENDOTHELIN-B RECEPTORS

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In the current study we investigate the interaction between Endothelin-B receptors (ETB) and endothelial nitric oxide synthase (eNOS) expression in the kidney of normotensive rats using immunohistochemical approach. Experiments were carried out on conscious male, Wistar rats, 12-14 week old, divided in two separate groups: control and experimental, each containing six animals. Under general anesthesia with Nembutal i.p., the femoral artery and vein were catheterized. The selective blockade of ETB receptors was performed through i.v. infusion (25 µl/min) of BQ-788 in dose 1mg/kg/h in the course of 60 minutes. The control animals were infused intravenously with 0.9% NaCl for the same time period.

In the end of the experiments the animals were sacrificed by an anesthetic overdose and their kidneys removed and immersion fixed in 10% NBF. Paraffin sections, 5µm thick, were used for the immunochistochemical detection of the eNOS in the kidney of animals in control and in experimental group.

The kidney cortical region of the animals with selective blockage of ETB receptors showed an interesting striped view on a low magnification, which corresponded to a strong specific expression of eNOS. Based on the morphology observed, we found intracytoplasmic staining in the cells of the proximal convoluted and straight

tubules of the cortical nephrons. We established up regulation of eNOS isoform after selective blockade of ETB receptors. These results support the hypothesis that ETB receptors regulate the eNOS isoform expression in the renal cortical region in Wistar rats.

KEY WORDS: rat kidney; eNOS; endothelin ETB receptors; selective blockage; immunochistochemistry

THE MENSTRUATION STATUS DEPENDENT HISTOMORPHOLOGICAL AND IMMUNOEXPRESSION CHANGES IN THE BREAST TISSUE (SEEN ON ROUTINE BIOPSY SPECIMEN)

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Many details, regarding breast tissue involution and expression of different immunomarkers are known in general, but the structural components of the breast tissue are hormone dependent and change with age.

Aim of the following study was to describe the morphological changes and expression of several immunomarkers in breast tissue in the context of menstruation status.

Tissue samples from 15 patients, treated surgically for breast cancer were analyzed. Morphologically normal breast tissue was immunostained as part of normal tissue control slides for ER, p63, CK5/6, CD34, CD31, D2-40. Immunopositivity was analyzed and documented.

The expression of CD34 demonstrated reduction of the number of immunopositive myofibroblasts in menopausal women, which was gradual in terms of age/menstruation status and was related to the appearance of the intra and interlobular stroma. CD31 and D2-40 demonstrated normal distribution of vascular structures. Lymphatic vessels were fewer in number and appeared collapsed in menopausal women, compared to premenopausal. Involution was evident in the epithelial structures of breast parenchyma in menopausal women, where ER was found to decrease, eventually to be absent in some glandular structures. Myoepithelium was positive for p63 and CK5/6 was expressed in myoepithelium around ducts.

The transition from reproductive life to menopause causes gradual decrease in immunoexpression of ER in luminal epithelium and simplification of the breast parenchyma and stroma, without significant change of the expression of CD34, CD31 and D2-40 in stromal myofibroblasts and vascular structures. Myoepithelium and its immunoexpression was preserved in glandular structures.

KEY WORDS: menstruation status, immunohistochemistry, morphological changes, breast tissue

EXPRESSION OF NEUROACTIVE SUBSTANCES IN THE PULMONARY NEUROEPITHELIAL BODIES OF SPONTANEOUSLY HYPERTENSIVE RATS

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Neuroepithelial bodies (NEBs) are highly specialized clusters of cells dispersed throughout the epithelium of intrapulmonary airways in many species. They serve as peripheral chemoreceptors and are part of the diffuse neuroendocrine system. The NEBs are dually innervated by both vagal and spinal primary afferents and by postganglionic fibers from the sympathetic chain ganglia. In addition, the NEB cells contain and release a variety of neuroactive substances in response to a hypoxic challenge. To get insight into their chemical nature, we tested with immunohistochemical methods the expression of small-molecule transmitters such as acetylcholine (ACh) and the amino acid gamma aminobutyric acid (GABA), the monoamine neurotransmitter serotonin (SER), a peptide hormone, vasoactive intestinal peptide (VIP), and the gaseous neuromessenger, nitic oxide (NO) in spontaneously hypertensive rats, an animal model that displays spontaneous pulmonary hypertension. Using light microscopy we were able to detect the presence of the ACh-synthesizing enzyme, choline acetyltransferase (ChAT)-, GABA, SER- and VIP-containing neuroendocrine cells protruding into the lumen of the intrapulmonary airways and neuronal nitric oxide synthase (nNOS)-immunoreactive varicose fibers innervating immunonegative cells of the NEBs. Our results show a broad spectrum of neuroactive substances expressed by the neuroendocrine cells and that nitrergic innervation is part of the complex innervation of the NEBs. These findings indicate an important role of the NEBs as pulmonary chemoreceptors and suggest that both systemic and pulmonary hypertension can be mediated by common mechanisms and transmitters. Further research is needed to conclusively establish causal relationships between the neurotransmitters involved in systemic hypertension and pulmonary damage.

KEY WORDS: lungs, neuroepithelial bodies, SHRs

ELECTRONIC POSTERS

ARONIA MELANOCARPA EFFECT ON LEPTIN EXPRESSION IN EPICARDIAL ADIPOSE TISSUE

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Aronia melanocarpa is valued as a great source of antioxidants, especially polyphenols. Previous research has demonstrated that these berries may provide cardiovascular health benefits in high-risk populations. Leptin is a hormone secreted by adipocytes and enterocytes that inhibits hunger and helps the regulation of energy balance.

The aim of this study was to investigate the effects of Aronia melanocarpa on the immunohistochemical expression of leptin in epicardial adipose tissue.

Male Wistar rats (n=18) were separated into 3 groups: young controls (2-months old); old controls (24-months old); Aronia group 24-months old supplemented orally with 100% juice from Aronia melanocarpa (10 ml/kg) for 12 weeks. Immunohistochemical reaction was performed on epicardial adipose tissue of the three groups of animals with antileptin antibody by ABC method.

Our results showed that there was weak immunohistochemical reaction in the epicardial adipose tissue of the young healthy rats. In comparison with them the leptin reaction was increased in the same tissue of old rats. Aronia juice oral supplementation for 12 weeks led to a significant decrease in the leptin immunohistochemical expression in the epicardial adipose tissue of the old rats compared to the same age non-treated old animals.

Consumption of Aronia berry polyphenols demonstrates beneficial effect of adipose tissue

leptin expression, indicating that regular Aronia consumption has the potential to exhibit strong antioxidant activity, potential anti-inflammatory activities and promote healthy aging.

KEY WORDS: aging, heart, Aronia melanocarpa, leptin

DESIGN AND OPTIMISATION OF PCR PRIMERS FOR DETECTION OF SINGLE NUCLEOTIDE POLYMORPHISMS IN THE LEPTIN RECEPTOR GENE

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Single nucleotide substitutions in exon 6 of the gene for leptin receptor (LEPR) are known to alter the molecular interactions between the receptor and its ligand – leptin. The LEPRQ223R polymorphism is associated with adipose tissue dysfunction as well as an increase in body mass index (BMI), serum leptin levels, systolic and diastolic blood pressure. Recent research has also found that the LEPRQ223R polymorphism leads to impaired glucose homeostasis, insulin resistance and type 2 diabetes mellitus.

Further investigation into the frequency of the LEPRQ223R polymorphism and its role for the development of obesity and type 2 diabetes mellitus requires the creation and optimisation of novel PCR protocols that accurately and specifically detect the polymorphism.

The nucleotide sequence of the LEPR gene and the specific DNA fragment containing the LEPRQ223R polymorphism were obtained from NCBI. Primer design was carried out using the online platform OligoPrime and the size of the target amplicon was 230 bp. The primers were designed so that the resulting amplicon contains sites for restriction digestion analysis of the LEPRQ223R polymorphism.

Primer annealing temperature and specificity were tested using gradient PCR with temperatures ranging from 55 to 65˚C. The products of PCR amplification were visualised by gel electrophoresis on a 2.5% agarose gel using UV light.

Optimal primer design was achieved that enabled specific amplification of a segment of the LEPR gene containing the LEPRQ223R polymorphism, without formation of non-specific products.

KEY WORDS: polymorphism, LEPRQ223R, primer design

EFFECT OF HYPERGLYCEMIA ON BAX PROTEIN EXPRESSION IN PUBERTAL RAT TESTES

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Complications due to diabetes mellitus (DM) include impaired proceeding of spermatogenesis and male infertility. Investigation of apoptotic protein expression in conditions of hyperglycemia would contribute to elucidate the mechanisms underlying reproductive disorders in diabetic males. Bax is a multidomain, proapoptotic member of the Bcl-2 family that is required for normal spermatogenesis in different mammalian species. The ratio of Bax/Bcl-2 family members is a critical determinant of cell fate: elevated Bcl-2 favors extended survival of cells and increasing levels of Bax expression accelerate cell death.

Aim: The aim of our study was to investigate the Bax expression in pubertal rat testes in order

to explore the possible mechanisms underlying germ cell apoptosis induced by experimental hyperglycemia.
DM was induced by single intraperitoneal injection of streptozotocin at dose of 100 mg/kg b.w. on day 1 (neonatally, NDM) or day 10 (prepubertally, PDM) in rats. Treated animals were sacrificed on day 18 (puberty). To detect changes in expression of the proapoptotic protein Bax by SDS-PAGE and Western blot testis lysates were used. As a loading control housekeeping protein α-actin was applied.
Our results revealed strong but not constant reaction of antibody against proapoptotic Bax protein in pubertal rat testes. We detected bands on the membrane corresponding to 21kDa Bax protein in most of the NDM and PDM samples. In the control group Bax expression was not detected. Bax protein levels in both NDM and PDM testes increased after hyperglycemia, however Bax expression in NDM testes were higher than in PDM experimental samples.
The experimentally induced diabetes mellitus (NDM and PDM) leads to higher Bax protein expression that favors apoptosis in pubertal rat testes. Expression of pro-apoptotic factor Bax is probably involved in suppression of spermatogenesis caused by hyperglycemia.
Acknowledgement: This study was supported by Grant № KP-06-M21/3 for Junior Basic Researchers and Postdocs from the Bulgarian National Science Fund.
KEY WORDS: diabetes mellitus, apoptosis, Bax, rat testes

THE "SWISS ROLL" – A SIMPLE TECHNIQUE FOR HISTOLOGICAL VISUALIZATION OF THE MURINE INTESTINAL TRACT

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The gut is the largest microbial, endocrine and immune organ in both mice and humans. The murine intestinal tract is a difficult organ system to study because of its long tubular structure, narrow diameter and delicate mucosa which undergoes rapid changes after sampling prior to fixation. This study represents the Swiss roll technique, as a simple method that allows systematic histological analysis of the entire intestinal tract. To visualize a general morphology of intestines using the Swiss roll technique, we performed the protocol as described by Moolenbeek and later modified by Williams. The entire small and large intestine of an adult C57BL/6 mouse was removed, divided in segments, opened longitudinally and rolled with the mucosa outwards. After histological processing, microscopic examination of the intestine is possible. Compared to other techniques for histological analysis of intestine wall, the Swiss roll is the preferable method that allows systematic histological analysis of the entire intestinal tract by longitudinal sections together with basic methods for data collection.
KEY WORDS: mouse, intestine, Swiss roll technique, histology.

ENDURANCE TRAINING AND PREBIOTICS AFFECT THE ACTIVITY OF KEY ENZYMES IN SKELETAL MUSCLE IN STREPTOZOTOCIN-INDUCED DIABETES IN RATS

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Regular physical exercise is associated with a number of positive health effects in type 1 diabetes (T1DM). Oligosaccharide prebiotics are relatively new, low-risk functional supplements that have great potential in affecting glycemic control.
The aim of this study was to investigate the effect of endurance training and prebiotic intake on the activity of key enzymes in soleus muscle of rats with experimentally induced T1DM.
Wistar rats (n = 32) were allocated into four groups: sedentary (S), sedentary with diabetes (SD), trained with diabetes (TD) and trained with diabetes, taking prebiotic (TDP). T1DM was induced by streptozotocin (60 mg·kg-1, i.p.). The trained rats were subjected to a 6-week treadmill training (45 min/day, 5 days/week). Blood sugar was measured weekly. At the end of the experiment, the rats were euthanized, material from soleus (fiber type I) was taken and enzymohistochemical techniques were applied. The activity of SDH, NADH2 and LDH in muscle fibers was analyzed morphometrically.
The sedentary animals with diabetes had hyperglycemia and decreased SDH enzyme activity compared to S. The trained groups had higher activity of SDH compared to SD, with no significant difference between them. The activity of LDH was increased in SD, while in the trained groups it was lower compared to SD. Regarding NADH2 activity, no significant differences were found.
The results of our study show that endurance training may play a beneficial role in preventing some of the negative changes caused by T1DM by affecting enzyme activity in skeletal muscles.
KEY WORDS: type 1 diabetes, endurance training, prebiotic, soleus, enzyme activity

GDNF – AN ANTIAPOPTPTOC FACTOR IN TESTICULAR AGING?

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In testicular Lydig cells the production of a number of biologically active substances has been established, which along with testosterone are involved in important local auto- and paracrine control of testicular function. Among them are marker molecules like the Glial cell line-derived neurotrophic factor (GDNF), specific for neurons and neuroendocrine cells. GDNF has been studied for its role as a neurotrophic and antiapoptotic factor in different populations of neurons. It implements its effects by binding to specific receptors (GFR- α1, GFR- α2 и GFR- α3), executing a variety of biological functions, including a role in testicular cell differentiation. Until now the imunoexpression of GDNF in Lydig cells has not been well examined in connection to its probable role in the process of apoptosis in the testis during aging, thus defining the purpose of this study. Male rats' testicular fragments of age groups 7, 18 and 24 months old were sampled and prepared for routine histological and imunohistochemical analysis. Our results reveal a strong imunoreactivity for GDNF in LC of 7-month old rats and reduction of imunoexpression in aged LCs. The gathered data about the GDNF expression in testicular LCs of different age groups suggest its probable role as an antiapoptitic factor regarding the testicular steroidogenesis during aging.
KEY WORDS: Lydig cells, GDNF, apoptosis

HISTOMORPHOMETRIC QUANTITATIVE ANALYSIS OF COLLAGEN CONTENT IN SHR KIDNEY

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Hypertensive nephrosclerosis is associated with various renal morphological changes leading to chronic renal failure. These alterations include severe glomerulosclerosis, tubular atrophy as well as tubulointerstitial fibrosis. Multiple studies have revealed the altered balance between collagen synthesis and degradation in the development of renal fibrosis. The aim of the present study was to evaluate the collagen content of the renal cortex in the kidneys of 6- and 12-month-old male spontaneously hypertensive rats (SHR). These age periods correspond to the initial and chronic phases of hypertensive kidney damage. We used Mallory's trichrome staining method in order to evaluate the collagen content of the renal cortex with a dedicated software. We used the smart segmentation function to separate the collagen fibers, stained in blue with Mallory's trichrome method, from the surrounding renal structure. The collagen content was expressed as a percentage of the whole examined cortical area on each section. The accumulation of collagen fibers in the tubulointerstitium and glomerular capillary tufts was more pronounced in 12-month-old SHR and the increase was reported to be statistically significant. The obtained results demonstrate the severe progression of collagen expansion in the renal structure over the course of hypertensive kidney damage.
KEY WORDS: kidney, hypertension, fibrosis, collagen content

IMMUNOHISTOCHEMICAL CHARACTERIZATION OF THE EFFECT OF RADIATION ON SMOOTH MUSCLE CELLS IN THE STOMACH

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Radiation damage to tissues generates an uncontrolled inflammatory process. The use of radiation therapy in the abdominal area can damage the structures in it. As the tissues of the gastrointestinal tract are particularly susceptible to radiation damage, it is of fundamental and practical interest to study the potential adverse effects of ionization therapy.
The present study describes some histological changes that are observed in the smooth muscle cells of the stomach after irradiation with accelerated electrons, associated with cell damage and subsequent inflammation with mast cell infiltration.
Ten mature white male Wistar rats, with body weight 230 – 250 g, were used in the study. The experimental animal group was exposed to a singular beam of electrons with 9MeV of energy. The operational doses of 5Gy were applied individually and in fractions, using Siemens Primus S/N 3561 (linear accelerator).
We detected an inflammatory response in the stomach after irradiation to the experimental group with doses of 5Gy. Early signs of inflammation were confirmed by the an increase of mastocytes, together with a change in the expression of serotonin receptors in smooth muscles in the stomach.
Tissue response after being affected with accelerated electrons includes processes of oxidation and inflammation. The reason for the infiltration of inflammatory cells is not well researched, which gives rise to the need of further investigation.
KEY WORDS: electron beam irradiation, rat, mastocytes, gastro-intestinal

LYMPHATIC TISSUE IN THE PORCINE GALLBLADDER

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The components of mucosal associated lymphatic tissue have been widely studied in pigs and humans. However, the data of the existence and components of lymphatic tissue in porcine gallbladder are missing.
The aim of this study was to define the components of lymphatic tissue in the wall of gallbladder in immature and mature pigs.
A light microscopic observation was performed on the lymphatic tissue localized in the three parts of the gallbladder: fundus vesicae felleae, corpus vesicae felleae and collum vesicae felleae. We revealed that lymphatic tissue in gallbladder is represented by diffuse lymphatic tissue, primary and secondary type of solitary lymphatic nodules as well as aggregated lymphatic nodules. In 2 month-old pigs, diffuse lymphatic tissue only was observed. In 6 month- and 3 year-old animals except for diffuse lymphatic tissue, both primary and secondary lymphatic nodules were defined. The statistical analysis showed that the diameter of lymphatic nodules in 6 month- old pigs is larger than in 3 year-old ones.
In conclusion, the presence of lymphatic nodules and aggregates defines the gallbladder`s mucosa as important part of the mucosal immune system in pigs.
KEY WORDS: lymphatic tissue, morphometry, pigs

NICOTINAMIDE ADENINE DINUCLEOTIDE PHOSPHATE-DIAPHORASE (NADPH-D) REACTIVITY IN THE WALL OF PORCINE AUDITORY TUBE

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The auditory tube is an important part of the middle ear which actively participate in equalization of air pressure and is a natural way for transmitting of inflammation from the nasopharynx to auris media. The lack of data of NADPH-d reactivity in the wall's structures of porcine auditory tube and evidenced role of that enzyme in function of organism motivated us to perform that study.
The pieces from the three parts of entire auditory tube wall – pharyngeal, middle and of 6 (3 males and 3 females) 6 months old, 90 – 100 kg/b.w. pigs slaughtered for a meat consumption in accordance with the Bulgarian legislation. They were immediately fixed in 4% paraformaldehyde in phosphate buffer (PBS), pH 6.9, transported in freezing bag to lab and fixed for 24 hours at 40C and washed with 0.01M PBS, pH 6.9. From them cryostat section 15 – 20 μm and then the free floating sections were treated by Sherer-Singler (1983) method for NADPH-d histochemistry.
The light microscopic observation showed different NADPH-d activity in the wall's structures. The most expressed reaction was found in vessels endothelial layer of arteries and veins. The reaction in the middle shell and adventitia of such vessels was weak to moderate. The same reaction was also found in muscle bundles and connective tissue. However, the mast cells showed strong positive reaction.
The original results gave a reason to presume that positive structures in the tube wall take an important participation of nitric oxide metabolism and in local organ's microenvironment.

KEW WORDS: auditory tube, NADPH-d reactivity, pig

SEMI-QUANTITATIVE ANALYSIS OF FIBROBLAST GROWTH FACTOR-2 EXPRESSION IN THE HYPERTENSIVE MYOCARDIUM

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Recent studies have indicated that cardiac mast cells take part in the process of hypertension-induced myocardial remodeling by promoting fibroblast activation, myofibroblast differentiation and collagen synthesis and accumulation. Their impact on these processes is mediated by the action of tryptase, chymase, histamine and fibroblast growth factor-2 (FGF-2), which are stored in mast cell granules. The aim of the present study was to analyze the immunohistochemical expression of FGF-2 in the left and right ventricle of two age groups of spontaneously hypertensive rats (SHR), indicative of established (early) and advanced (late) hypertensive heart disease. We used 6- and 12-month-old male SHR, each group consisting of six animals. Immunohistochemistry was conducted with a mouse monoclonal anti-FGF-2 IgG antibody and a semi-quantitative analysis of the expression of FGF-2 was made using the ImageJ software. FGF-2 immunoreactivity in the left ventricle of 6-month-old animals was negative to low positive, while in 12-month-old SHR it was predominantly low positive to positive. In the right ventricle, immunoreactivity was mostly negative in the younger age group and low positive in 12-month-old animals. Expression was particularly intensive in the cytoplasm of mast cells, which were most numerous in the areas of interstitial fibrosis. These findings support the key role of mast cells and FGF-2 derived from them in the development of hypertension-induced myocardial remodeling.
KEY WORDS: fibroblast growth factor-2 (FGF-2); myocardium; immunohistochemistry; spontaneously hypertensive rat (SHR)

THE ROLE OF THE JUXTAORAL ORGAN IN THE WRONG HYSTOPATHOLOGICAL DIAGNOSIS

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The juxtaoral organ (JOO) is a vestigial anatomical structure first described by Johan Chievitz. The JOO is located in the infratemporal region at the level of the submucosa associated with the retromolar trigone, medial to the medial pterygoid muscle.
It is a small, tapered structure that is not obvious macroscopically. Histologically it is composed of an epithelial parenchyma included in a stroma of richly innervated organized connective tissue. The parenchyma is made up multilobed epithelial cells consisting of circumscribed nests of squamous, columnar and occasionally basaloid non-keratinizing epithelial cells with a denned glandular or organoid pattern with no keratin formation. The function of the JOO is indeterminate, although immunohistochemical studies show that it is neuroepithelial and glandular in nature, being for some authors a structure with mechanoreceptor characteristics.
Its existence and characteristics are not usually described in lectures and classic texts of general histology and oral histology. Nevertheless, knowing its location and histological characteristics is valuable because its presence in surgical specimens subjected to histopathological analysis with a diagnosis of squamous cell carcinoma may be confused

with a perineural invasion of tumor cells, which can have considerable influence on a patient's prognosis.
The JOO is a benign structure that can frequently be found in the normal anatomy of an individual. Its function has not been clarified, which is why it is presumed to be a dispensable structure, although knowledge of it is important to avoid the erroneous diagnosis of an invasive process from a malignant oral mucosa lesion.
KEY WORDS: juxtaoral, organ, histopathological, diagnosis, tumor

TRIPEPTIDYL PEPTIDASE I ACTIVITY IN PIG'S URETEROVESICAL JUNCTION – AN ENZYME HISTOCHEMICAL STUDY

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Tripeptidyl peptidase I (TPP-I) is a lysosomal peptidase ubiquitously expressed in central nervous system and internal organs. The lack of data of TPP-I reactivity in structures of porcine ureterovesical junction motivated us to perform that study.
The pieces from the intraorganic ureteral part with adjacent vesical wall of 6 (3 males and 3 females) 6 months old, 90 – 100 kg/b.w. pigs slaughtered for a meat consumption in accordance with the Bulgarian legislation were fixed in 2% formaldehyde in 0.1 M cacodilated buffer, pH 7.0 for 20 hours at 40C. After washing in modified Holt's solution they were frozen in liquid nitrogen and cryostat sections 10 μm were prepared, covered with collodione and incubated in acetate buffer (pH 4.5) containing the substrate and 4-nitrobenzaldehyde for 70 minutes at 370C. Finally, the sections were fixed in buffered 4% formaldehyde and embedded in glycerol/gelatin (1:1).
TPP I reactivity was established in almost of all structures. Strong reaction was found in the endothelial layer of blood vessels, but it was more expressed in venous one. Similar finding was observed in the ureteral's epithelium and capillaries in the propria. In the arterial media and in both ureteral and vesical smooth muscle bundles, as well as in autonomic nerves the reaction was moderate. Comparative weak activity was observed in the connective tissue.
The data obtained gave a reason to presume that TPP I actively participate in function of blood vessels and autonomic nerves and in keeping of local microenvironment in that important part of urinary system.
KEY WORDS: ureterovesical junction, trypeptidyl peptidase I, pig

CLINICAL AND SURGICAL ANATOMY

ORAL PRESENTATIONS

ANATOMICAL RETINAL IMAGE ANALYSIS WITH OPTIC COHERENCE TOMOGRAPHY (OCT)

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Human vision is one of the most complex visual systems among animals. The eye is the main sensory organ of the visual system that detects the physical stimuli of the light rays and transduces them into electrical and chemical signals sends along the optic nerve to the brain. The eyeball has three main layers: the outer layer

sclera, which includes the cornea; the middle layer is the choroid; the innermost layer is the retina which contains photoreceptor cells.
In practice of ophthalmology OCT is a non-invasive imaging modality critical element of the clinical diagnosis for analysis of individual retinal layer properties. Posterior segment evaluation with OCT allows visualization of the vitreous, retinal layers, macula, retinal pigment epithelium (RPE) and choroidal layers. The posterior hyaloid of vitreous can be identified on macula scans. Each nine distinct retinal layer is visible on the OCT from Internal Limiting Membrane (ILM) to Retinal Pigment Epithelium (RPE) and corresponds well to histological studies. Additionally, OCT Angiography (OCT-A) is an approach in imaging ocular vessels based on flow. Besides visualisation it is possible to measure thickness of each layers of retina, optic nerve also the perfusion values.
The aim of this article is to define the retinal anatomy based on the OCT device data used to analyse the structures of it and changes in the retinal layer in clinical diagnosis.
This article concludes a basis of normal retinal anatomy with an overview of current research classification of OCT images.
KEY WORDS: OCT, retina, imaging, anatomy, ophthalmology

CEREBELLOPONTINE AND INTRATEMPORAL COURSE OF THE FACIAL NERVE: MORPHOLOGICAL, TOPOGRAPHIC AND MORPHOMETRIC FEATURES

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The purpose of this study is to present some morphological and morphometric aspects of the facial nerve and especially of the tympanic and mastoid segments of this nerve. Optimizing operative approaches to the Cerebelloponitne angle (CP) requires an undestanding of the relationships of the cerebellar arteries, cranial nerves, brain stem, and the cerebellar surfaces.
At the same time, some anatomical variations which involve the canal of the facial nerve (Fallopian's canal) in cerebellopontine surgeries, dehiscences, tract deviation or other anatomical deviations are presented. To evaluate the risk of the facial nerve injury during operations for chronic otitis media with or without cholesteatoma, stapedectomy in otosclerosis, exploratory tympanotomy, CP angle vestibular schwannomas, CP angle meningiomas that involve facial nerve area. This review of the course of the facial canal through the petrosal portion of the temporal bone from the internal auditory meatus to the stylomastoid foramen, paying particular attention to its relations to adjacent structures.The intricate course of the facial nerve through the temporal bone is of vital concern to all otologic and brain surgeons, since it often traverses the surgical field.
KEY WORDS: cerebellopontine angle, intratemporal course, facial nerve;

DUA'S LAYER – DISCOVERY OF A NEW LAYER IN THE CORNEA AND ITS CLINICAL SIGNIFICANCE

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The purpose of this study is to present the finding of recently discovered layer deep in the cornea and its clinical use. Until now the cornea is known to consists of the following layers: epithelium, Bowman's membrane, stroma,

Descemet's membrane (DM) and endothelium.
The existence of Dua's layer as a distinct anatomical feature, especially relevant to the surgical anatomy of the cornea was confirmed in a series of experiments conducted in Nottingham by Prof Dua and his team.
Peeling donor DM from the deep stroma reveals the presence of compact, tough stromal layer. Dua postulated that the plane of cleavage in DALK was not between DM and the stroma, but between a preDescemet's layer and deep corneal stroma.
Light and electron microscopic and immunohistology studies of DL revealed that it varied in thickness from 5 to 16 µm. It is made of five to eight compact lamellae of type I collagen, more than the rest of the corneal stroma. Long – spacing collagen was also demonstrated on electron microscopy. The layer is devoid of keratocytes. It is shown that DL extend to the periphery of the cornea.
The knowledge of the architecture of the cornea is essential for corneal transplantation surgery.
Recognition of the previously unrecognized/ undescribed corneal layer situated deep in the cornea will contribute to the understanding of lamellar keratoplasty, especially deep anterior lamellar keratoplasty and posterior corneal pathology.
KEY WORDS: cornea, keratoplasty, Dua's layer, deep anterior lamellar keratoplasty, corneal transplant

LEFT CARDIAC DOMINANCE: A CASE REPORT

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The cardiac muscle can be supplied by three types of coronary circulation depending on the emerging site of a. interventricularis posterior (posterior descending artery - PDA).
The right dominant type of circulation is the most common (70-80%). The left dominant type is the most infrequent (5-10%). When a. interventricularis posterior is perfused by both right and left coronary arteries, the cirulation is denominated codominant (10-20%).
During the dissection course, a well expressed left dominant heart has been identified.
We present the anatomical structure of the left cardiac dominance. In our case a. interventricularis posterior arises from r. circumflexus of the a. coronaria sinistra and gives a. posterolateralis and small branches for the right ventricle, left ventricle and posterior one third of the septum.
Knowledge of the left dominant type of coronary circulation has clinical importance in the field of cardiology, invasive cardiology and heart surgery.
KEY WORDS: heart, coronary circulation, left cardiac dominance

MORPHOLOGICAL CHARACTERISTICS OF THE ARTERY OF THE ATRIOVENTRICULAR NODE IN CONGENITAL HEART DEFECTS

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Until now, the regularities of the blood supply to the conducting system in terms of ontogenesis and in congenital heart defects remain insufficiently clarified. Purpose of the work: to study the topographic and anatomical characteristics of the artery of the atrioventricular node in complex congenital heart defects. The material of the work was 44 heart preparations of fetuses of 24 – 28 weeks and children of the first three years with complex congenital defects: the full form of the common atrioventricular canal, Fallot's tetrad, a combination of a defect of the interventricular septum with a common arterial trunk. A complex of generally accepted morphological methods aimed at identifying the

conducting system of the heart, blood vessels, and its blood supply was used. According to the data obtained, with CHD, the artery of the atrioventricular node arises from
the artery that determines the type of blood supply to the heart. With the full form of the common atrioventricular canal, the presence of a "U" -shaped bend of the coronary artery at the site of the origin of the atrioventricular node artery is not constant, which is apparently associated with the position of the node in the embryonic position. The ratio of the artery of the atrioventricular node to the edge of the defect is determined by the localization of the latter. With the full form of the common atrioventricular canal, the defect is located anterior and upward from the artery of the atrioventricular node, with a secondary defect of the interatrial septum, the artery of the node passes under its lower edge. The severity of the lateral branches from the artery of the atrioventricular node to the septa of the heart is determined by the peculiarities of hemodynamics in CHD. The emergence of large branches from the artery of the atrioventricular node to the posterior wall of the right atrium and the myocardium of the interventricular septum was revealed in Fallot's tetrad.

KEY WORDS: artery of the atrioventricular node, congenital heart defects

SPECIAL FEATURES OF THE STRUCTURAL ORGANIZATION OF THE HEART CONDUCTING SYSTEM IN DOWN'S SYNDROME

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Children with Down syndrome have a high risk of developing congenital heart disease.
The aim of the work is to study the features of the structural organization of the cardiac conduction system in relation to the structure of the parts of the interventricular septum (sinus, trabecular, cone) in Down syndrome.
The material for the work was 22 heart preparations for newborns and infants with Down syndrome. In 9 of them, the formation of the heart was completed in the usual way, that is, without a congenital defect. In 6 preparations, the full form of the open atrioventricular canal was noted.
To identify the atrioventricular node, the bundle of the same name, its right left bundles, macromicropreparation, histological research method, morphometry were used. Attention was drawn to the shape and parameters of parts of the right side of the interventricular septum.
It has been found that in Down's syndrome, when a heart is formed without a congenital defect, the characteristics of the parts of the atrioventricular section of the conducting system and the interventricular septum approach the critical, that is, the extreme variants of the anatomical standart. In the structure of the parts of the interventricular septum, there are features that are not observed in the normal development of the heart. Intermediate varieties of the structural organization of the conducting system predominate, mainly between II - III types. In children with Down syndrome, when a heart is formed without a congenital defect, the characteristics of parts of the atrioventricular section of the conducting system are close to those in type III of its anatomical correspondence with the heart, which is considered as a transitional one between normal and abnormal development.
As a result of the study in children with Down syndrome, as in normal development, the dependence of the characteristics of the parts of the conducting system on changes in the structure of the parts of the interventricular septum with which they are associated was confirmed.

KEY WORDS: artery of the atrioventricular node, congenital heart defects

SURGICAL ANATOMY OF PELVIC FASCIAE AND AUTONOMIC NERVES REVISITED – IMPLICATIONS FOR RECTAL AND PELVIC FLOOR SURGERY

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For precise rectal and pelvic surgery, a detailed anatomical knowledge is needed.
The aim of the study is to investigate the topographic anatomy of pelvic autonomic and pelvic floor nerves and plexuses and their relations to different subdivisions of pelvic fascia, and to point the importance for surgery.
Materials and methods: 1. personal detailed dissection of formaldehyde preserved and fresh cadavers; 2. intraoperative investigations; 3. histological sections from the cadavers, the resected operative specimens and from human fetuses; 4. extensive literature review on the topic.
In pelvis parietal and visceral compartments (rectal and urogenital) with corresponding fasciae could be defined. Autonomic nerves serve as markers for planes of dissection. The main part of the autonomic pelvic nerves is enveloped in two layered urogenital /presacral/ fascia. The roots of sympathetic nerves and parasympathetic nerves lies behind parietal pelvic fascia. Rectal nerves perforate the urogenital fascia and enters rectal compartment in lateral rectal ligaments and in rectosacral fascia; weather urogenital nerves are situated in the urogenital compartment.
The nerves to levator ani muscle lie beneath levator ani fascia. Peritoneoperinealis fascia, lateral rectal ligaments and rectosacralis fascia are derivates of urogenital fascia and autonomic nerves.
Distinction should be made between anatomical structures that have embryological and histological substrate /fascial planes, nerves, compartments/ from artificially created structures during surgical dissection /ligaments and spaces.
Different pelvic fascial layers and adjacent nerves are guiding structures for definition of surgical planes of dissection during rectal and pelvic operations
KEY WORDS: pelvic fascia, pelvic autonomic nerves, pelvic floor, rectal surgery

KIMMERLE'S ANOMALY – AN UNDERESTIMATED CLINICAL CONDITION

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The first cervical vertebra, the atlas, an integral component of the craniocervical junction is a ring-shaped vertebra which is in close relationship with the vertebral artery and the suboccipital nerve (dorsal ramus of CI). Certain anomalies of the atlas may have clinical significance for neurology, surgery, otorhinolaryngology, chiropractic and other manual therapies. Kimmerle's anomaly also known as ponticulus posticus or arcuate foramen is a common anatomical variation of the atlas. This is an aperture formed by the presence of a complete bony bridge on the posterior arch of the atlas thus forming a canal for the passage of the vertebral artery. A meta-analysis among humans shows an overall prevalence of 16,7% reported from cadaveric, computed-tomography and x-ray studies. Kimmerle's anomaly has been found in adolescents and it does not appear to be age-related condition. Atlases with arcuate foramen present cortical bone thickening that may contribute to lower fracture risk. On the other hand, is has been associated with intimal dissection of the vertebral artery and problems like vertebrobasilar ischemia, shoulder-arm pain, neck pain, vertigo, lacrimation, Bell's

palsy, vision changes, hearing impairment, hemiparesis and even thalamic infarctions.
The Kimmerle's anomaly is often an underestimated clinical condition. Its presence should always be kept in mind during the examination of patients with similar symptoms, as well as during craniocervical surgical, chiropractic or imaging interventions and this is the aim of our report.
KEY WORDS: atlas, foramen arcuatum, vertebrobasilar ischemia, pain syndrome, craniocervical surgery

ELECTRONIC POSTERS

BONE REGENERATION STIMULATED BY ERYTHROPOIETIN

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The results of attempts for accelerated bone regeneration under the action of erythropoietin are presented. In 36 experimental animals, divided into 3 groups, we created two artificial defects on the calvary of the skull.
Each hole is placed under different regeneration conditions and the right defect of the animals of the third group is left without external stimulation.
Histological preparations were made from the bone material on the 30th and 90th day, some of which were stained by the Schmorl method and others by HE.
Recovery proceeds at different rates depending on the tissue regeneration stimulators used.
The results are presented in tables and graphs.
KEY WORDS: erythropoietin, osteogenic effect, bone regeneration, calvarial experimental model

THE IMPORTANCE OF CLINICAL ANATOMY AND APPLICATION TO BRACHIOPLASTY SURGERY

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Bariatric surgeries are very common, with a rise in procedures means plastic surgeons will have to manage excess skin in parts of the body more frequently. For brachioplasties, variation in the medial brachial cutaneous nerve and its proximal and distal branches is of high significance.
A review of scientific and surgical anatomy publications was carried out. This was a collaborative study between the department of Plastic and Reconstructive Surgery at UMBAL "Dr. Georgi Stanski" and the Department of Anatomy, Medical University - Pleven, Bulgaria.
The studies purpose is to outline that it is crucial for the surgeon to know anatomical landmarks and possible variations of the MBCN to be able to locate and be better equipped when planning and carrying out the procedure.
Nerve injuries during a brachioplasty were classified as one of the major complications. It is possible for the surgery to be performed with a lower risk, but the patient should be made aware of the possible risks involved. With anatomical knowledge of the MBCN course and prior planning allows identification of the high-risk areas for incision which can be avoided.
Ultimately this will provide a satisfactory outcome while also decreasing the possibility of complications.
KEY WORDS: arm, surgical, brachioplasty, variations, MBCN

MORTON'S TOE PREVALENCE IN BULGARIAN POPULATION

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The morphology of the foot is determined by its anatomical structures, by age, body weight and by the lifestyle of the individual. According to the length of toes, several types of foot are described - Greek, Egyptian and Roman.
The object of our study is the "Greek foot" or Morton's toe which is characterized by a longer second toe in relation to the first one. This appearance is due to the shortening of the first metatarsal bone. We studied the frequency of this condition in Bulgaria among randomly selected men and women aged 18 to 60 years. Within the same group of participants, the foot arch height was investigated as we used for this the Clarke angle and the Chippaux-Smirak index. We used the classic and well-established method of foot prints (plantograms). 46 out of 102 plantograms were positive for Morton's toe. According to the foot arch height the participants' foot prints were divided into three groups: normal (85), flat (7) and high arched foot (10). Our study showed a high prevalence of Morton's toe among the Bulgarian population – 45%. Furthermore, the statistical analysis (the $\chi 2$ test) proved an association between the high arched foot and Morton's toe ($p \leq 0.05$).
Each of this conditions itself is associated with pain and discomfort in the forefoot. The high prevalence of Morton's toe in Bulgarian population and its proved association with high arched foot should be concider in physiotherapy, sport medicine and orthopedic practice.
KEY WORDS: Morton's toe; foot arch heigh; plantogram

THE IMPORTANCE OF CLINICAL ANATOMY AND ITS VARIATIONS IN FACIAL NERVE BRANCHES FOR ITS IDENTIFICATION FOR PAROTIDECTOMY

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Having thorough knowledge of the underlying intricacies of the facial nerve anatomy is one of the contributing factors that aid surgeons to carry out parotidectomy procedures, that can variate from person to person. Structurally the facial nerve branches can have many variations (types 1-6). Knowing which landmarks identify the FNT, such as the cartilaginous tragal pointer, the tympanomastoid suture, the posterior belly of digastric, the styloid process, and the retromandibular vein is crucial. Although the facial nerve as an entity is well understood, its variations and course through the parotid are not as well known.
A thorough review of the present literature was conducted and documented here. This was a collaborative study between the department of Facial Plastic and Reconstructive Surgery and the Department of Anatomy, Medical university Pleven, Bulgaria.
It is vital to know the facial nerve structures, route and its anatomical variations whilst performing parotid related procedures due to their close proximity to one another.
Because the facial nerve runs through the glandular substance of the parotid gland, an accurate and in-depth understanding of the anatomy is absolutely crucial when performing parotidectomies/parotid related procedures. Facial nerve injury during parotidectomy remains one of the most significant complications. Preventing facial nerve injury starts with the surgeon being well informed about the variations. Also, meticulous identification of the landmarks

and attention to surgical detail, will facilitate safe FNT identification leading to successful parotid surgery.

KEY WORDS: facial, surgical, parotidectomy, variations

PERIORBITAL ANTHROPOMETRIC MEASUREMENTS IN SERBIAN POPULATION

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Periorbital region is an important role in the diagnosis of several syndromes, disease, birth or traumatic defects and thus in the attractiveness of the face. Also, this area is subject to age, sex and ethnicity variations. The aim of present study is to perform periorbital anthropometric analysis in Serbian population and determine the existence of differences between sides of participants.
Approval from the Institutional Ethics committee of Faculty of Medicine, University of Novi Sad, Serbia was taken for the study. The study was conducted on 50 adult Caucasian subjects (25 male and 25 female). The age range was 18 to 21. Photographs were taken using "Nikon 3400D" professional camera and then measured using "Image J 1.48v" software. Morphometric analysis included: distance between the mid-points of both pupils, distance between both internal canthus, distance between both external canthus, distance between upper and the lower eyelid margin in three different positions. Data obtained was analyzed using "Windows Excel". Student's t-test was used at the $p<0.05$ level of significance.
In Serbian population distance between the mid-points of both pupils is 60.09±3.39 mm, distance between both internal canthus is 30.90±2.58 mm and distance between both external canthus is 84.54±4.32 mm. Distance between upper and the lower eyelid in mid-points of the pupil is 9.19±1.52 mm in right side, and 9.30±1.53 mm in left side.
Some parameters of the periorbital region have been shown morphometric differences regarding the side within the same group of participants.

KEY WORDS: Anthropology, Anthropometry, Periorbital region.

RADICULAR CYST IN THE MANDIBLE – A CLINICAL CASE

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Radicular cyst is the most common jaw cyst. The development is associated with periapical inflammatory changes around carious tooth and roots. Broad conceptual theory is development of epithelial Malassez remnants meaning residual epithelial cells in the periodontal ligament. The aim of poster is to present a clinical case of 37-yearold male patient (Amb. № 125/2020.11.25) with a radicular cyst in the lower jaw on left side found accidentally on ortopanthomography. Radiographical images revealed radiolucent lesion surrounded by dense sclerotic border (linea alba). Material

and methods: roots 35 (attached to cyst), 36, 37 are extracted, followed by horizontal incision along the extracted tooth and vertical releasing divergent incisions, the trapezoidal full-thickness mucoperiosteal flap also is reflected after mandibular nerve block anesthesia with 4% articaine, 1:000,000 epinephrine. The bone surrounding cyst is fenestrated by conventional rotatory instruments followed by complete cyst removal according to Partsch II procedure – radical cystectomy. Histopathology examination № 21999/2020.11.27 showed the presence of radicular cyst. Conclusion: biopsy after cystectomy is obligatory investigation associated with conformation of radiological diagnosis.

KEY WORDS: biopsy, radicular cyst, cystectomy

THE IMPORTANCE OF CLINICAL ANATOMY AND ITS VARIATIONS OF THE FACE DURING THE AGING PROCESS IN RELATION TO THE RHYTIDECTOMY PROCEDURE

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Rhytidectomy has become a very popular procedure in the field of aesthetics. Therefore, it is very important to understand the anatomical structures and variations in all ages. Features like atrophy of the subcutaneous fat, temporal and buccal fat pads, skin thickness, elasticity and bone structure changes during the aging process are important concepts.

A methodological study and analysis of scientific literature was conducted. This was a collaborative study between the department of Plastic and Reconstructive Surgery at UMBAL Pleven and the Department of Anatomy, Medical university Pleven, Bulgaria.

The aim of the study is to show and emphasize the importance and understanding of the anatomical landmarks of the facial region. The aging process changes the perspective and physiology of the tissues and this is something that the surgeon needs to have in mind while planning the surgical approach.

The last decade or so have been exciting in the field of aesthetic facial surgery. Multiple procedures are beginning to use different anatomic dissection planes. Importance rests on the experience and the awareness by the surgeon of the intricacies of the head and neck region.

With thorough knowledge of anatomy and structural variations possible with aging, the rhytidectomy can be carried out with great confidence and the surgeon will be well adapted to the possible variations that they will come across This will make the outcome successful in terms of safety and patient satisfaction.

KEY WORDS: facial, surgical, rhytidectomy, variations

SALIVARY GLANDS BIOPSY DUE TO PRESENCE OF SJÖGREN'S SYNDROME – A CLINICAL CASE

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Sjögren's syndrome can be defined as a chronic autoimmune disease characterized by lymphocytic, plasmacytic infiltration, destruction of salivary and lacrimal glands. The most common clinical features are xerostomia (dry mouth), xerophthalmia (dry eyes) and rheumatoid arthritis. To confirm diagnosis of Sjögren's syndrome is considered biopsy as the most accurate method – histological changes involving minor salivary glands of oral mucosa,

lips, hard palate. The aim of poster is to present a clinical case of 47-year-old female patient (Amb. № 8/2021.02.10 with a Sjögren's syndrome send from rheumatologist to oral surgeon for simple intra-oral soft tissue biopsy. Material and methods: intraoral incision (1 см) is made followed by reflection of the internal side of lower lip mucosa, some minor salivary glands are exposed and removed under local infiltration anesthesia with 4% articaine, 1:000,000 epinephrine. Histopathology examination № 2984/2021.02.22 showed presence of mucous salivary gland with Sjögren's syndrome (SS) morphological dates. Conclusion: biopsy from minor salivary glands is considered as the safetiest method related to Sjögren's syndrome diagnosis conformation due to presence of oral appearances.

KEY WORDS: biopsy, Sjögren's syndrome, salivary glands

MORPHOLOGICAL ASPECTS OF MYOCARDIAL BRIDGES

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Myocardial bridging is recognized as a frequent anatomical variant of the coronary arteries in which a subepicardial artery has an intramural course within the myocardium.

The purpose of this study was to compare the morphometric characteristics of myocardial bridges in different localizations. We investigated 40 heart specimens of mature and elderly humans who died from non-cardiac causes. We made slices perpendicularly to the long axis of the branches of coronary arteries. Histological sections were made from areas containing myocardial bridges. By means light microscopy with a digital camera, we measured parameters of intramural coronary arteries and myocardial bridges.

Myocardial bridges were found in 25 (62.5%) of the hearts with a total of 37 bridges. Bridges were most often found over the anterior interventricular artery (22). Bridges were also over the diagonal branch of the left coronary artery (one), over the left marginal branch (ten) and over the posterior interventricular branch of the right coronary artery (four). The thickness of the bridges varied in the range of 0.1–2.3 mm (Me=1.02), the area of perivascular space 0.29–9.77 mm2 (Me=2.19), the cross-sectional area of the intramural artery 0.14–5.22 mm2 (Me=1.87). The results showed that the cross-sectional area of the anterior interventricular artery is significantly larger than the arteries of other localizations (p=0,03), while the other parameters of the myocardial bridges did not differ.

KEY WORDS: heart, myocardial bridges, coronary arteries

INVOLVEMENT OF LEPTIN IN THE BILIARY CHOLESTEROL METABOLISM AND GALLSTONE DISEASE

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Disturbances in the colloidal stability of bile can trigger processes of crystallization and formation of stones. 85% of gallstones contain cholesterol. Our aim was to search for the link between adipose tissue leptin, obesity, hypercholesterolemia and cholesterol gallstones.

Six obese female-patients with cholelithiasis were examined by biochemical methods, transabdominal-ultrasonography and diagnostic-therapeutic endoscopic-retrograde-cholagiopancreatography (ERCP). Subcutaneous

adipose tissue from the gluteal region of other 6 obese female-patients was taken by liposuction and investigated immunohistochemically for leptin by the ABC method.
We found positive immunohistochemical expression for leptin in the subcutaneous adipocytes of the obese women which were with impaired lipid profile. They had biochemical parameters similar to that of the obese women with cholelithiasis. In 5 of these patients significant amounts of cholesterol concrements were found. In one case the concrements were mixed - bilirubin and bilirubin-cholesterol.
High-density-lipoproteins (HDL) are the main source of biliary cholesterol. The hypersecretion of biliary cholesterol is the key in the pathogenesis of gallstone disease.
Adipose tissue and leptin are of the factors that interfere with the metabolism and modulate this secretion. This can lead to the formation of cholesterol stones, as seen in our female patients with gallstone disease.
KEY WORDS: leptin, biliary cholesterol, gallstone disease

ACUPUNCTURE POINT MINGMEN (GV 4) – TOPOGRAPHIC ANATOMY

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The main goal of our research is to describe the topographic anatomy of the area where GV 4 acupoint is located and predict which are the structures that could interact while the point is being stimulated by the methods of the Traditional Chinese Medicine (TCM). We have described all of the structures located between the spinous processes of the 2-nd and 3-rd lumbar vertebra and the spine.
In the investigated area from the surface to the depth are observed the following anatomical structures: skin, subcutaneous tissue, the superficial back fascia (fascia dorsi superficialis), the medial ramus of the dorsal branch of the spinal nerve (n. thoracici XI) and the thoracolumbar fascia (fascia thoracolumbalis). The following ligaments and muscles are located in depth and in the middle plane: the supraspinous ligament (lig. supraspinale), the interspinous ligament (lig. interspinale) and the lumbar interspinal muscles (mm. interspinales lumborum). In addition, parts of the muscles, like the thoracal muscles of the spine (mm. spinales thoracis), the longissimus thoracis muscle (m. longissimus thoracis) and the multifidi muscles of the lumbar spine (m. multifidus lumborum) are also observed in the area (L2-L3). In the area of the point also pass the dorsal ramus of the spinal nerve (ramus dorsalis, nervi spinales), the muscular and cutaneous branches of the dorsal branch of the lumbar artery II (a. lumbalis II) and posterior external vertebral venous plexuses (plexus venosus vertebralis externus posterior).
In conclusion, we assume that the described anatomical structures are related to the healing effect of TCM.
KEY WORDS: mingmen, GV 4, anatomy, acupoint

ABOUT THE CHANGES IN THE VERTEBRAL COLUMN IN SOME AGE PERIODS

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The aim was the structural features of the vertebral column of individuals in the adolescence age, also first and second stages of adults. Age-related changes in vertebrae were studied structurally on 168 vertebrae taken from 14 human skeletons in research work.
Spinal dystrophy can be different in people with different diseases and main feature is a change in the height of the intervertebral disc, is accompanied by cartilage atrophy. As with age-related the height of the intervertebral disc gradually decreases and takes on a wedge shape. But at the same time the height of central parts increases, the discs become convex on both sides.
The gelatinous nucleus of the disc grows due to the accumulation of more fluid and as a result, the disc resembles a convex lens by squeezing adjacent vertebral bodies together. In people with dystrophy of the vertebral column, as they age, the bodies of these middle part, the lower thoracic and upper lumbar vertebrae, a typical bilateral shape.
There is a decrease in the height of the vertebrae along the vertebral column often 11-14 cm with age, especially in old men. Local dystrophic changes are less common in adults. Dystrophic changes in the vertebral column can be accompanied by vitamin deficiencies, endocrine diseases, metabolic disorders.
KEY WORDS: vertebra, vertebral column, dystrophic changes, thoracic vertebrae, upper lumbar vertebrae

CALOT`S TRIANGLE - AND HEPATOCYSTIC TRIANGLE - LIKE AREAS IN DOMESTIC SWINE

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Duo to the similarities to humans in anatomy and functions of the immune system the domestic swine is one of the most preferred species for experiments especially in developing new surgical techniques in the cholecystectomy in humans. The knowledge of anatomy of the borders and structures of the Calot`s triangle and of the hepatocistic triangle can be very useful in preventing the intraoperative and postoperative complications during experimental laparoscopic cholecystectomy in pigs and in a treatment of cholelithiasis in humans.
The facts above motivated us to undertake the current study.
The aim of the study was to establish the existence of both the Calot`s triangle and the hapatocystic triangle and the length of their borders in the domestic pigs. This research work was conducted on livers from 30 male pigs separated to different age groups.
The results showed that Calot`s triangle - and the hapatocystic triangle – like areas are present.
The borders of the triangles were identified, measured and statistically analyzed in immature and mature pigs. In porcine triangles, age dependent differences were identified in some of the studied parameters.
In conclusion, this study revealed that, like in humans, the Calot`s triangle and the hepatocystic triangle are presented and have an important clinical significance especially during the experimental laparoscopic cholecystectomy in pigs.
KEY WORDS: Calot`s triangle, hepatocystic triangle, pigs

CRANIOMETRIC POINTS ESSENTIAL GUIDENCE IN THE NEUROSURGICAL PRACTICE

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Craniometric (basic and key) points are essential for orienting neurosurgeons in their practice. Understanding the correlations of these points help to manage any pathological lesion located on the cortical surface and subcortically. The brain sulci and gyri should be identified before craniotomy. It is difficult to identify these anatomical structures intraoperative (after craniotomy) with precision.

The main purpose of this study was to collect as much information as possible from the literature and our clinical practice in order to facilitate the placement of craniotomies without using modern neuronavigation systems.

Operative reports from the last five years on cranial operations for cortical and subcortical lesions were reviewed. All the craniotomies had been planned, using four methods: detection of craniometric points, computed tomography (CT) scans/topograms, magnetic resonance imaging (MRI) scans/topograms, and intraoperative realtime ultrasonography (USG).

Retrospectively, we analyzed 295 cranial operations. Our analysis showed that operating on for cortical lesions, we had frequently used the first and the second method mentioned above (118 patients), while in cases of subcortical lesions, we had used craniometrics points, MR scans/topograms and intraoperative real-time USG as methods of neuronavigation (177 patients).

These results show that craniometric points are essential in both neurosurgical procedures.

KEY WORDS: neuronavigation, craniometric points, CT/MRI, topograms, intraoperative real-time ultrasonography (USG)

NEUROANATOMY AND NEUROSCIENCE

ORAL PRESENTATIONS

CHRONIC TREATMENT WITH AGOMELATINE ALLEVIATES NEUROGLIA-MEDIATED INFLAMMATION IN RATS UNDERGOING CHRONIC CONSTANT LIGHT

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Neuroinflammation mediated by activated microglia is a key factor in the pathophysiology of depression and likely represent a novel target for antidepressant treatment. The atypical antidepressant agomelatine (Ago) has advantages compared to classical drugs with its chronobiotic activity as a selective agonist at melatonin receptors and an antagonist at 5HT2C receptors. We have recently reported that Ago can exert an antidepressant effect in rats exposed to chronic constant light (CCL). The present study aimed at investigating whether the anti-inflammatory activity of Ago on activated neuroglia in specific brain structures might contribute to its antidepressant effect in this model. We found that the vehicle-treated CCL rats showed profound neuroinflammation characterized by microgliosis and astrogliosis in certain stress-related limbic structures and confirmed by immunohistochemistry. In particular, we detected an increased number of Iba1-positive amoeboid-like cells and GFAP-immunostained ramified astroglial cells in the rat dorsal hippocampus, dentate gyrus, basolateral amygdala and piriform cortex following CCL exposure than in the control group. This was accompanied by neuronal damage in the same regions and impaired neurogenesis in the hippocampal dentate gyrus detected by reduced doublecortin-immunoreactive cells compared to the control group. We also observed that Ago significantly alleviated the over-activated

microglia and astrocytes in a structure-specific manner, partially restored suppressed neurogenesis in the late stage while it failed to produce neuroprotection in CCL-exposed rats. Our results suggest that the anti-inflammatory effect of Ago contributes to its beneficial activity against depressive-like response in a model of melatonin deficit.

KEY WORDS: agomelatine, antidepressant, CCL, microglia, astrocytes, rat

MORPHOLOGICAL AND MORPHOMETRIC ANALYSIS OF THE EXTERNAL APERTURE OF THE CAROTID CANAL IN SERBIAN POPULATION

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The carotid canal is a bony canal that begins with the external aperture located on the lower surface of the petrous part of the temporal bone. The carotid canal transmits the internal carotid artery along with the venous and sympathetic nerve plexus. The aim of this study was to investigate the shape, location and dimensions of the external aperture of the carotid canal in Serbian population.

The study included 33 skulls. Diameters and distances of the external aperture of the carotid canal from various important landmarks of the skull base were measured. The shape of the external carotid canal aperture was also noted. Digital data were processed in the ImageJ software.

The average length of the external aperture of the carotid canal in all skulls on the right and left sides was 7.82±1.85 mm and 8.36±2.08 mm. The average width of the external aperture of the carotid canal on the right and left sides was 5.85±1.45 mm and 6.17±1.57 mm. The frequency of different shapes of the external aperture of the carotid canal was as follows: oval in 34 (53.97%), round in 19 (30.16%), and the rarest was almond shape noted in 10 (15.87%) cases.

There were no statistically significant differences in all measured parameters between genders and body sides. The results of this study will be useful for neurosurgeons to improve different surgical approaches to the petrous part of the internal carotid artery and prevent its complications.

KEY WORDS: carotid canal, morphology, morphometry, skull, temporal bone

PHENOTYPICAL CHARACTERIZATION OF ZBTB20-EXPRESSING CELLS IN THE PRIMATE SUBVENTRICULAR ZONE

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The major forebrain niche of adult neurogenesis is the anterior subventricular zone (SVZa) of the lateral ventricle, adjacent to the striatum. This region consists of an ependymal layer (EL) comprising the ependymal cells, a gap zone and the underlying subependymal layer (SEL). The SEL is the site of actively proliferating neural stem/progenitor cell, in which the stem cells (also known as B-cells) divide to give rise to transient amplifying cells (known as C-cells), which differentiate into neuroblasts (known as A-cells) - a immature migratory neural cell type. Zbtb20 a zinc finger transcription factor that plays an important role in development. In rodents, Zbtb20 was shown to be present in the SVZ. Here we characterized ZBTB20 expression in the primate SVZa. To this aim we co-localized ZBTB20 expressing SEL cells with markers for SVZ stem/progenitor cells at different stages of development and analyzed the percentages of co-expression. Here we report for the first time

the phenotype of the ZBTB20-positive cells in the adult monkey SVZa.

KEY WORDS: primate, subventricular zone, neural stem cells, ZBTB20

TRANSCRIPTIONAL PROFILES IN DIFFERENT SUBDOMAINS OF THE ADULT MONKEY SUBVENTRICULAR ZONE NEUROGENIC NICHE

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The subventricular zone (SVZ) along the walls of the cerebral lateral ventricle (LV) of the primate brain is a stem cell niche which retains capacity for stem/progenitor cell proliferation into adulthood. The SVZ along the anterior (frontal) horn of the LV is designated SVZa, while the SVZ along the inferior (temporal) horn of the LV is designated SVZi. We have previously shown that both the SVZa and the SVZi respond with an increased proliferation of stem/progenitor cells following a global cerebral ischemia in monkeys. However, only the SVZa showed an enhancement of postischemic neurogenesis. The differences in the neurogenic capacity of SVZa and SVZi could be underlined by a differential gene expression in response to ischemia. Here we studied the transcriptional response SVZa and SVZi of adult monkey brain following transient, global cerebral ischemia. Using RNA Sequencing analysis we detected differentially expressed genes after ischemia in both SVZa and SVZi. We then applied bioinformatics analysis on the differentially expressed genes and detected significantly different transcriptional profiles between SVZa and SVZi. We studied the expression of selected genes using high-throughput in situ hybridization which precisely localized the response to ischemia to specific SVZ layers. The reported here transcriptomics and in situ expression results provide for the first time a molecular basis for the differential neurogenic capacity of primate SVZ subdomains.

KEY WORDS: primate, brain ischemia, subventricular zone, neural stem cells

ELECTRONIC POSTERS

EXPRESSION OF NEUROTROPHIC FACTORS AND THEIR RECEPTORS IN THE RAT SPINAL TRIGEMINAL NUCLEUS

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The spinal trigeminal nucleus as part of the trigeminal sensory nuclear complex is associated with the transmission of discriminative tactile sensations from the orofacial region. Our previous experiments have revealed the presence of certain neutrophic factors such as the nerve growth factor (NGF), brain-derived neurotrophic factor (BDNF), and neutrophin-3 (NT-3) in this nucleus. These neurotrophins facilitate neuronal differentiation, survival, and plasticity by signaling through high-affinity transmembrane receptors.

By using primary antibodies against NGF, BDNF, NT-3 and glial-derived neurotrophic factor (GDNF), and their corresponding receptors of the tyrosine receptor kinase (Trk) proto-oncogene family and GFRalpha, we found immunoreactive cells scattered along the whole length of the nucleus in rats. In particular, we observed that the majority of spinal trigeminal neurons were intensely immunostained for all the neurotrophic factors examined and that they

were richly endowed with their Trk receptors. In addition, some glial cells in the nucleus were immunopositive for NT-3, GDNF and its receptor GFRalpha, respectively.
Our results show that virtually all spinal trigeminal neurons and a subset of glial cells in the nucleus are immunoreactive for neurotrophic factors and their receptors. It is plausible that these neurotrophic factors are involved in mechanisms of central sensitization in trigeminal nociceptive pathways. Therefore, in addition to their local paracrine mechanism on spinal trigeminal neurons, they may contribute to a better understanding of the fundamental mechanisms of the orofacial pain.
KEY WORDS: rat spinal trigeminal nucleus, neurotrophoic factors, neurotrophic receptors

FACIAL ASYMMETRY IN PATIENTS WITH SCHIZOPHRENIA

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Increased asymmetry in homologous structures shows reduced resistance of the organism to harmful external impacts and has a significant value in the establishment of prenatal operating factors. Some epidemiological and pathophysiological characteristics suggest that the causes for mental disorders can be found in the perinatal or early postnatal period, which is one of the basic principles of neurodevelopmental hypothesis of mental illness.
The present study aimed to establish the level and the differences of facial asymmetry in patients with schizophrenia.
The study included 132 patients (71 males and 61 females) with schizophrenia of Bulgarian origin. Six anthropometric measurements (one oblique, four horizontal and one vertical) were taken using a standard sliding caliper for the right and left side of the face according to the methods of physical facial anthropometry. The data were analyzed with SPSS 20.0., using Paired-Samples T test with a level of statistical significance set at $P < 0.05$.
The male schizophrenia patients showed significantly higher level of facial asymmetry in three of the anthropometric measurements, while four of the measurements reached statistical significance in the female patients.
In terms of neurodevelopmental hypothesis, high facial asymmetry may be considered a sign of impaired neurodevelopment and may contribute to the establishment of a link between prenatal exogenous events and subsequent structural changes in ectodermal derivatives.
KEY WORDS: facial asymmetry, schizophrenia, anthropometric dimensions, neurodevelopmental hypothesis

FEATURES OF PERIPHERAL NERVES EARLY MYELINATION OF THE FETUS

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With aim studying of myelination structural features of the similar peripheral nerves of the upper and lower limbs in an early prenatal ontogenesis, were investigated the musculocutaneous nerve also superficial peroneal nerves. Pieces nerves were processed for microscopically (in the example of 46 by the Veygert-Pal method) and an electron microscopically investigation (in the example of 64). For an electron microscopically method

pieces of nerves are taken in 90 minutes after death moment. Nerve fibers, the innervating muscles of both the upper and lower limb are exposed to more accelerated myelination, than the fibers supplying skin. At early stages of myelination are noted the hanging orientation of internal and external mesaxons. The size of a cross cut of unmyelination nerve fibers depend on the size of groups where they are located. In process of increase in amount of nerve fibers in group's diameter of an axon decreases. In a prenatal ontogenesis between thickness of a myelin sheath and diameter of the axon, there is a rectilinear correlative communication. In some cases, divergences from the general regularity are noted. It is characteristic of earlier stages of the process myelination.

KEY WORDS: peripheral nerves, musculocutaneous nerve, superficial peroneal nerve, myelination

FORMATION OF DIFFERENT MYELIN FIBERS

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Both vegetative and animal nerves were studied during this research. For this purpose, greater splanchnic nerve such as the sympathetic nerve, the motor root of the ciliary ganglion as the parasympathetic nerve, and the superior branch of the oculomotor nerve of the eye as the animal nerve have been studied. Both light and electron microscopy methods were used in the study. The results of the study showed that there is a sharp difference between the autonomic and animal nerves in the process of myelination. In prenatal ontogenesis, myelination of the autonomic nervs lags behind that of the animal nerves. In early myelination, the autonomic nerve fibers are quantitative, and in animation, quality is differentiated. Nerve fibers myelinate at different times and at different speeds. Deviations from symmetry are also evident in their myelination. Asymmetry is more characteristic of greater splanchnic nerve. In addition, the thickness and number of myelin sheaths vary in different nerve fibers. This process is more common in both the prenatal and early postnatal periods.

KEY WORDS: myelination, prenatal ontogenesis, nerve

MORPHOMETRIC PARAMETERS OF THE 3D MODEL OF DOGIEL TYPE II CELLS OF THE PLEXUS OF THE SMALL INTESTINE

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The aim was to calculate the morphometric parameters of isolated Dogiel type II cells from the intermuscular plexus of the small intestine.
Main results. Neurocytes of the ganglia of outbred rats (n = 12) were identified by the impregnation. To assess the volume of the perikaryon color photographs were taken. The photographs were converted into the BMP bitmap format (3DtooLR software environment). The resulting images were first combined in a Cartesian coordinate system, and then, after aligning the planes and transforming them into an Stl file, into a solid model (in the AutodeskR software environment).
The results showed that the total number of nodes in the virtual model was 36534, and the mesh elements - 156595. The resulting 3D model of the cell and nucleus was reduced 900 times to obtain a three-dimensional cell and nucleus with absolute dimensions with a ratio of 1:1 to their true size. The volume of the Dogiel type II cell was 2785.11 μm³, the volume of the nucleus was 647.7 μm³ and the volume of its perikaryon is 2785.11 μm³.
Main conclusions. Dogiel type II cells from the intermuscular plexus have a three-dimensional structure of an ovoid shape. They are flattened

in the transverse direction and elongated in the longitudinal direction.
KEY WORDS: Dogiel type II cells, neurocytes of the ganglia, small intestine.

PROGRAMMED CELL DEATH IN ZBTB20 KNOCKOUT MICE

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There is an extensive knowledge about the role of transcription factor Zbtb20 in the hippocampal and neocortical development. There are not so many scientific researches about its function in the cerebellar development. The aim of our study is to investigate the effect of Zbtb20 in the cerebellar development during the first 12 postnatal days (P). We have worked with Zbtb20 knockout mice (Zbtb20-/-) and wild type (WT), used as controls. There are three experimental groups, respectively at age P4, P8, and P12. The histological slices from cerebellum were immunostained for detection of activated caspase3 (aCasp3). This is a selective marker for programmed cell death - apoptosis. At P4 we found higher number of aCasp3-positive cells in mutants than controls. A higher number of cells was found in folia V and VI in controls, and in mutants – in folia III and IV. At P8 the number of aCasp3-immunoreactive cells in mutants exceeds their number in controls. A higher number of cells was found in folium IV in controls, and in mutants – in folium IV and V. At P12 the number of aCasp3-immunoreactive cells in mutants exceeds their number in controls. A higher number of cells was found in folia V and VI in controls, and in mutants in folia IV and V. There is no significant difference in the foliation between controls and mutants. We can conclude, that Zbtb20 modulates the apoptosis in the developing cerebellum during the first 12 postnatal days.
KEYWORDS: cerebellar development, activated caspase3, transcription factor Zbtb20, Zbtb20 knockout mice, programmed cell death

ROLE OF SERUM ANTI-GM3 ANTIBODIES AS MARKER IN NEURODEGENERATIVE DISORDERS

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The titers of serum IgM and IgG antibodies to gangliosides GD1a, GM1 and GM3 can serve as biomarkers showing nervous system chronic dysfunction. For many years, our team has been studying the titers of serum antiganglioside antibodies in patients in different phases and forms of autoimmune and neurodegenerative diseases. Anti-GM1 antibodies may be marker for demyelination. The elevated titers of IgM and IgG anti–GD1a antibodies suggest immune-mediated neurodegeneration. Anti-GM3 antibodies could show the state of the blood-brain barrier integrity and other parameters as well. This could be suggested by the established increased titers of antibodies to GM3 in results from pilot studies in patients with Multiple sclerosis and Alzheimer's disease. For this goal we apply ELISA technique. Serums are taken before any therapy or immune intervention. Early diagnosis and rapid initiation of neuroprotective

therapeutic strategies are extremely important.
KEY WORDS: GM3 ganglioside, anti-GM3 antibodies, neurodegenerative disorders, ELISA

TOPOGRAPHIC ANATOMY OF THE TEMPORAL BRANCH OF THE FACIAL NERVE

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The aim was the topographic anatomy of the temporal branch of the facial nerve.
Principal results. The temporal branches were studied in 73 preparations. The number of temporal branches varies from 1 to 4. In 4 cases (5.5 ± 2.7%), one temporal branch was determined, 42 cases (57.5 ± 5.8%), two, 25 cases (34.2 ± 5.6%) – three, and 2 cases (2.7 ± 1.9%) - four temporal branches. The first temporal branch starts from the upper portion; the initial part is at the upper edge of the parotid gland. It crosses the zygomatic arch at various distances anterior to the tragus. The second temporal branch also starts from the upper portion. Of the 44 investigated preparations, in 17 cases (38.6 ± 7.3%), leaving the upper end of the gland, it goes almost vertically, in 16 cases (36.4 ± 7.3%) with an oblique direction, and 11 cases (25.0 ± 6.5%) - almost horizontally. The third temporal branch had a direction close to the horizontal, and in some cases - an oblique direction. A fourth temporal branch is quite rare and goes under the zygomatic arch, almost horizontally, giving branches to the orbicularis oculi.
All branches, crossing the zygomatic arch, pass into the temporal region and connecting form a network: small, medium, and large-looped. Their branches are for the facial muscles.
KEY WORDS: temporal branch, zygomatic arch, facial nerve

A SIMPLE METHOD FOR LOCALIZATION OF NEURONAL STRUCTURES IN THE RAT COLONIC WALL

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The myenteric plexus, which consists of interconnected neuronal ganglia, is now the subject of significant research interest in diagnostic studies and evaluation of enteric disorders such as Hirschprung's aganglionosis. The consideration of a simple non-specific staining technique, as opposed to highly specific but more complicated and expensive immunohistochemical reactions, might be beneficial to the diagnostic process. In the present study, the presence and distribution of the neuronal structures in the rat proximal colon was investigated at the light microscopic level by means of the Golgi silver impregnation technique in combination with eosin counterstaining. The combination of specific silver deposition and the non-specific counterstaining of the surrounding soft tissues resulted in a contrast and informative highlight of the neuronal structures of the myenteric plexus. In particular, we observed polymorphic black staining in its expected location, i.e. the cleft between the circular and longitudinal layers of the muscularis externa. The impregnated structures appeared either as isolated cell groups or as a continuous layer of ganglion cell bodies, enteric glial cells and their processes. Moreover, neuronal structures were found in the surrounding muscle layers, with orientation strictly parallel to the muscle fibers. In conclusion, the similar staining patterns of

the neuronal perikarya and nerve fibers cause different problems or difficulties in distinguishing them. Nonetheless, this relatively simple method for qualitative evaluation of the myenteric plexus is sufficiently informative regarding the general presence of nerve structures in the colonic wall, which in certain cases might be beneficial for the diagnosis of aganglionic colonic segments.

KEY WORDS: myenteric plexus, rat, silver impregnation, aganglionosis

PHYSICAL AND PALEOANTROPOLOGY

ORAL PRESENTATIONS

ANTHROMETRIC STUDY OF PHYSICAL DEVELOPMENT OF SOFIA UNIVERSITY STUDENTS – PRELIMINARY RESULTS

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The studies of physical developments of young adults have not only theoretical significance but are very important for the evaluation and prognostic of the health status of the whole population. In the period 2016-2017 was started an anthropometric study of students of Biological Faculty of Sofia University "Saint Clemens of Ohrid". It has been continued in March 2020, but was interrupted by the measures against COVID-19 pandemic. During the studies 90 students (35 males and 55 females, aged 18 to 25) have been measured and surveyed for social and educational status and size of their families. They have been compared with data from former studies in university students (1986-2020). During this period the normal male-female differences have increased. Particularly large differences are observed in the indicators that reflect the development of the musculoskeletal system. Despite the small size of the sample a significant influence of social factors on body height in males has been found and a subsignificant one – on age at menarche in females. The collected information will serve to assess the real health risks of the students and to develop adequate programs and policies to improve life and health of the young generation of our country.

KEY WORDS: mesure, physical development

COMPARATIVE ANTHROPOLOGICAL CHARACTERIZATION OF FIVE POPULATIONS FROM NORTH BULGARIA

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Anthropological data from 5 samples of adult men from different local population in North Bulgaria (Bulgarians, Bulgarians-Balkandjis, Pomaks, Gagauzes, Turks) are processed statistically, analyzed after Michalski's methods and compared with 41 other samples from Bulgaria, Macedonia (North, but also South), Kosovo, Albania and Rumania by cluster and principal component analysis. The results show that they can be divided into two major groups (clusters). The first one includes populations with Centraleuropean characteristics – a combination of Nordic, Armenoid (Balkano-Caucasian) and Lapponoid (Uralo-Lapponoid) elements. The second cluster includes population with the typical Atlanto-Mediterranian (Atlanto-Pontic) combination of Nordic and Mediterranian elements. The first cluster spreads mostly in North Bulgaria, Serbia, Western Macedonia, Kosovo and Transylvania. The second cluster includes populations with the typical Atlanto-Mediterranian (Atlanto-Pontic) combination of Nordic and Mediterranian elements. It covers mostly Thracia, Eastern Macedonia and Western

Sofia region. The only sample from North Bulgaria which belongs to this cluster are the Pomaks from Toros village, for which it is assumed that they are decendents of Paulicians, migrated from Sothern Bulgaria. Four other – Bulgarians and Turks from Middle North Bulgaria, Bulgarians-Balkandjis and Gagauzes) belong to the Centraleuropean populations.

KEY WORDS: anthropological, characteristics

STUDY OF THE ERUPTION OF PERMANENT TEETH IN BULGARIAN CHILDREN (PRELIMINARY DATA)

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The age of tooth eruption is one of the main indicators used to evaluate the biological maturity and morpho-functional status of children. The assessment of the time and sequence of eruption of the different groups of teeth in children allows to establish whether it is normal, retained, retarded or complicated and to take timely measures to optimize their oral health. The eruption of permanent teeth is used in the process of preparing a treatment plan in dentistry and orthodontics. The aim of the study is to record the time of eruption of permanent teeth in children aged 5-14 years and to compare our data with similar ones for Bulgarian children. In this report are presented data for 121 children aged 6 to 8 years, divided into three age groups. Height, body weight and cephalometric characteristics (bizygomatical breadth, bigonial breadth, physiognomical face height, morphological face height, etc.) were measured and dental status (type of bite, number of erupting teeth, carious activity, rotations) was determined. The results are processed by the statistical program SPSS 16.
The first teeth to erupt are the first molars (both upper and lower) and the central lower incisors at the age of 80 months (6 years and 8 months). Eruption in these teeth is found to be earlier in boys than in girls. Statistically significant gender and age differences in the eruption of some permanent teeth are observed.

KEY WORDS: eruption, permanent teeth, children

ELECTRONIC POSTERS

THE SECRETS OF THE AMAZON TOMBS

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There are many legends about battles between ancient heroes and amazons. Is there real evidence for the existence of this warlike people of women warriors or are these just beautiful legends?
In the XX and XXI century from southern Siberia and west China, through Central Asia to the Black Sea were found about 300 graves of women warriors. More of them are associated mainly with Scythian culture.
The graves show that in some nations women fought alongside men to defend their homes. There are no traces of Amazons who kill all men, do not become mothers and live in a homosexual society, cut off one of their breasts to shoot a bow freely. Quite the contrary - in some graves there are also the bodies of babies or young children buried with their mothers. At the funerals of women warriors, the same honors were given as to men and they were buried in the same way. Ignorance of Scythian customs is at the heart of ancient myths about the Amazons.
The poor knowledge of the ancients is the reason for these fantastic legends. After the development of trade relations of the Balkan peoples with the

Scythians, the descriptions of women warriors became more realistic.

KEYWORDS: amazons, graves, women warriors, weapons, Scythian

APPLICATION OF THE FIRST MOLARS IN SEX ASSESSMENT IN BULGARIANS

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The aim of the present study was to determine the sex differences in odontometric dimensions of maxillary and mandibular first molars in Bulgarians. Materials and methods. The study included 86 healthy subjects (43 males, 43 females) of Bulgarian origin in the age group of 20 – 40 years, with fully erupted, periodontal disease free, caries free, non-worn teeth. Buccolingual, mesiodistal and cervicoincisal (coronal height) dimensions of maxillary and mandibular first molars were measured by Dentistry Sliding Vernier Caliper, Ridge Mapping Caliper Type A and Type B and analyzed with SPSS 23.0. The level of statistical significance was set at $P < 0.05$. Results. Cervicoincisal dimensions in both maxillary and mandibular first molars were significantly higher in males compared to females. Similar statistically significant differences were found in mesiodistal dimensions in first molars from both jaws. Buccolingual dimensions in both maxillary and mandibular first molars were significantly higher in males compared to females as well. Conclusion. The results of our measurements exhibited statistically significant sex differences in both maxillary and mandibular first molars in people of Bulgarian origin. In accordance with similar odontometric studies, first molars may successfully differentiate both genders and thus determine the need for further investigations in this field.

KEY WORDS: sexual dimorphism, odontometric dimensions, bulgarians, first molars

BODY COMPOSITION OF BULGARIAN BOYS SUFFERING FROM TYPE 1 DIABETES MELLITUS

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The aim of this study is to determine the body composition's indicators in Bulgarian boys suffering from type 1 Diabetes mellitus (DM1).
Patients and methods. We examined 66 boys aged 4-12 years and 60 boys aged 13-18years suffering from DM1. We also examined 211 healthy boys (controls), divided into the same two groups.
Investigated parameters: body fat % (%BF), body water (BW), active body mass (ABM) and bone-muscle mass (BMM). They were examined with bioelectrical impedance analysis. We used "Tanita" apparatus. The values were analyzed with SPSS 23.0. The level of statistical significance was set at $P < 0.05$.
We found significantly higher levels of BW and ABM in the healthy boys than in the boys with DM1 in both age groups. Interage comparison: the levels of BW, ABM, BMM were significantly higher in the group of 13-18 aged boys in comparison to junior group. This refers to the diabetic and healthy boys as well.
Bioelectrical impedance analysis gives accurate data on the components of body composition. The reported changes of body composition's parameters are result of the body's natural

growth process. The impact of DM1 is minimal.
KEY WORDS: DM1, bulgarian boys, bioelectrical impedance, body composition

BODY MASS INDEX, WAIST CIRCUMFERENCE AND BLOOD PRESSURE IN NORMAL WEIGHT AND OVERWEIGHT 2-6 YEARS OLD CHILDREN

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Body mass index (BMI) and waist circumference (WC) are widely used indicators for evaluating overweight and obesity and predicting cardiovascular and metabolic risk.
The aim of the study was to evaluate the relationship between body mass index, waist circumference and blood pressure (BP) in children under the age of 7 years.
A cross-sectional anthropological study of 1075 children (553 boys and 522 girls) visiting kindergartens in Sofia was carried out from 2014 to 2016. Body height, body weight, waist circumference and blood pressure were measured directly and BMI was calculated.The children were classified into five categories of nutritional status according to the International Obesity Task Force (IOTF) cut-offs. Normal WC and BP were defined as values < 90th percentile, and levels above this range were considered elevated.
BMI values are relatively constant during the investigated age period. Considerable increment of WC is established in 2 to 3-year-old boys and 4 to 5-year-old boys and girls. Average SBP and DBP increase with age, as an increment is significant between 4-5 years of age.
Nine percent of boys and 10.7% of girls are overweight and obese; 14.0% of children have a waist circumference above P90, and 9.0% of boys and girls have a higher BP.
In overweight and obese children mean values of systolic (SBP) and diastolic (DBP) BP in both genders are higher than in children with underweight and normal weight. Children with WC >P90 have higher SBP and DBP values.
BMI and WC did not strongly correlate with SBP and DBP in both genders.
KEY WORDS: body mass index, waist circumference, overweight, blood pressure, preschoolchildren

FACTOR ANALYSIS OF ANTHROPOMETRIC CHARACTERISTIC IN YOUNG TENNIS PLAYERS

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The main goal of every athlete is to achieve optimal performance. There are varieties of factors that indicated to have a positive impact on sports success. The aim of the present study is to determine the factor structure of anthropometric characteristics in adolescent tennis players. An exploratory factor analysis was conducted (Varimax method) on 42 anthropometric variables measured on 152 male and 148 female tennis athletes, aged 8-17 years. All tennis players (TP) included in the study had trained in tennis at least for 2 years, not less than 3 times weekly, and voluntarily participated in the present study. Statistical analysis of the collected data was performed by software SPSS 16.00. The factor structure of the anthropometric characteristic in 8-17 years old tennis players showed similar results in both sexes in terms of the total explained variance (79.091% in boys and 79.884% in girls). The two-factor and five-factor orthogonal structures were found to describe male and female groups,

respectively. The conducted factor analysis of the anthropometric characteristic in adolescent tennis players allows optimizing the system for sports selection and training. The morphological parameters with the highest weight of the factor are most strongly influenced by sports activity.

KEY WORDS: factor analysis, tennis players, anthropometric characteristic, adolescent

PALEO-PATHOLOGICAL DATA ABOUT HEALTH CONDITION OF BURIED IN THE OTTOMAN PERIOD IN SOZOPOL, NECROPOLIS EXCAVATED IN CHAIKA STR

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The osteological material from the necropolis on Chaika Str. in Sozopol, Bulgaria from the 2019 archaeological season is characterized by a high number of reburials, which is typical for the Ottoman period. Remains from a total of 37 individuals were identified among which those of 17 men (63% from the adult individuals whose sex could be established), 10 women (37%), 6 infants, 1 juvenile and the rest from adults whose sex could not be determined.

Several pathologies stand out from the preliminary results of the anthropological investigation, specifically on the cranial skeleton. Among them are 4 cases of craniosynostosis - in the male individual (Adultus 20-25) in reburial № 3, whose skull has clear signs of bathrocephaly; in the juvenis, possibly female individual (15-16) from grave № 4; in the male individual (20-25) from grave № 5, whose skull shows clear signs of plagiocephaly; in the female individual (20/25-30) from grave № 6, whose skull shows clear signs of plagiocephaly, as well as a thickening of the vault bones – possible indication for Paget's disease. Other lesions on the cranium include 2 button osteomas on the right parietal bone and signs of porotic hyperostosis on the adult individual from grave 11; an indentation on the left side of the occipital bone of the male individual from grave 10 (40-50/50-60), which could be the mark of survived trauma, including partial trepanation and cauterization; as well as different stages of cribra orbitalia in two male and the juvenis individual.

KEY WORDS: paleo-pathology, Ottoman period, Sozopol, Bulgaria

PALEODEMOGRAPHICAL CHARACTERISTICS AND PALEO-PATHOLOGICAL CHANGES IN THE POPULATION FROM THE NECROPOLIS IN THE NORTH SUBURB OF THE OLD BULGARIAN CAPITAL TARNOVGRAD (ASSENOV QUARTER OF PRESENT-DAY CITY)

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The studied series is provided from the necropolis, excavated in the "Assenov quarter" in Veliko Tarnovo, dated in the last quarter of 13th – end of the 14th c. CE, used in the period in which the medieval town was the capital of the Second Bulgarian Kingdom. Anthropologicaly investigated are 39 graves. A prevalence of male sex is ascertained (22 individuals, 66,67 %). Females comprise 33,33 % from the buried (11 individuals). Child mortality is poorly presented (11,90 %). The dentitions present relatively high incidence of dental caries and periodontal disease. Cribra orbitalia is also spread and found in male skeletons, relatively rare situation in paleo-populations. In five cases based on skeletal leasions can be supposed an infectious disease. In four individuals are found clues for disability conditions.

KEY WORDS: paleo-pathology, Middle Ages, Tarnovgrad

VARIA

ORAL PRESENTATIONS

CODED MARTIAL ARTS IN BULGARIAN FOLK DANCES, PRAVO HORO

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Bulgarian folk dances are established as a cultural national treasure of Bulgaria, and play an important role in Bulgarian traditions, both in the country and for Bulgarians abroad. The biomechanics of the human body allows only certain movements when a high level of efficiency, speed and coordination is required. Our research focuses on a comparative analysis of the movements in Bulgarian folk dance "pravo horo", and those in Wing Chun, as practiced in the European Wing Tsun Organization. Pravo horo has common forms with the forms from the Wing Chun complexes with a great deal of concurrence. Bulgarian folk dances have movements in them that can be used for self-defense.
KEY WORDS: folk dance, pravo horo, martial arts, wing tsun, self defence,

FRIEDREICH'S ATAXIA IN CHILDHOOD: ANATOMICAL-CLINICAL CORRELATION (CASE REPORT AND LITERATURE REVIEW)

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Friedreich's ataxia (FRDA) is the most common autosomal-recessive ataxia worldwide. FRDA is caused by a hyper expansion of GAA repeats in the first intron of the FXN gene in chromosome 9. That results in frataxin expression reduction leading to mitochondrial dysfunction. Structural damage in FRDA begins in the spinal cord, inferior cerebellar peduncle and the red nucleus, progressing to cerebral areas in adulthood. FRDA affects the dorsal spinocerebellar, the lateral corticospinal tract and the posterior thoracic nucleus. Symptoms include gait- and limb ataxia, cerebellar dysarthria, sensory loss, absent lower limb reflexes, pyramidal signs, scoliosis, pes cavus, reduced vibration sense, hypertrophic cardiomyopathy. Their onset varies from 2 to over 51 years. Disease manifestation in young children is more progressing and often results in disabling ataxia and hypertrophic cardiomyopathy before adulthood.
We present a case of a 20-year-old male diagnosed with Friedrich's Ataxia. The onset of symptoms starts at age seven with musculoskeletal abnormalities such as scoliosis and pes cavus, progressing to gait instability, loss of balance and trunk ataxia. The clinical phenotype also comprises of limb ataxia affecting the dexterity and the coordination of movements, decreased muscle tone and loss of limb reflexes with deep sensory loss. Bilateral positive Babinski sign was observed indicative of upper motor neuron injury and a positive Romberg as a result of peripheral nerve damage. ECG changes suggestive of left ventricular hypertrophy (LVH) progressing to cardiomyopathy are present. The purpose of this presentation is to show the clinico-anatomical correlation associated with disease progression.
KEY WORDS: Friedreich's Ataxia (FRDA), cardiomyopathy, clinico-anatomical correlation

ELECTRONIC POSTERS

ZN(II)/AU(I) AND ZN(II)/AG(I) WITH SCHIFF BASES DERIVED FROM 2,6-DIFORMYL CRESOL EXPRESS PROMISING CYTOTOXIC ACTIVITY IN DIFFERENT HUMAN CANCER CELLS

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SUMMARY
The aim of the present study was to evaluate the in vitro antitumor activity of 9 complexes of Zn(II)/Ag(I) and Zn(II)/Au(I) with Schiff bases derived from 2,6-diformyl cresol (diald) -Aepy, Ampy and Dmen.
Permanent human cell lines established from breast cancer (MCF-7 and MDA-MB-231), non-small cell lung cancer (A549), liver cancer (HepG2), glioblastoma multiforme (8MGBA), squamous cell carcinoma (A431) and its multidrug-resistant (MDR) clones A431-MDR, A431-MRP, and A431-ABCG2 that express mdr1, mrp1, or abcg2 gene, respectively were used as model systems. The investigations were performed by MTT test, neutral red uptake cytotoxicity assay, crystal violet staining, hematoxylin/eosin staining, double staining with acridin orange/propidium iodide and immunocytochemical detection of proliferation marker Ki-67 in short-term experiments (24-72 h, with monolayer cell cultures) as well as colony-forming method in long-term experiments (16-18 days, with three dimensional cancer cell colonies).
The results obtained revealed that applied at concentrations of 0.1- 100 µg/ml the compounds investigated reduce to various degree the survival and 2D / 3D growth of cancer cells and induce cytopathological changes typical for early and late phases of apoptosis.
Special attention deserve the complexes of Zn-dmen-Au, Zn-ampy-Au and Zn-aepy-Ag - they have shown promising antitumor activity in cultured cell lines that are obtained from some of the most common and highly aggressive neoplasms in humans as well as in MDR cancer cells. Their cytotoxic effect is comparable or even better than that of conventionally used in clinical practice anticancer agents cisplatin, oxaliplatin and epirubicin.
Acknowledgements: This study was supported by Grant КП-06-М41/1 from 27.11.2020, National Science Fund, Bulgarian Ministry of Education and Science and by joint project between Bulgarian Academy of Sciences and Romanian Academy.
KEY WORDS: antitumor activity, human cancer cells, metal complexes, Schiff bases

MRI PELVIC ANATOMY IN RECTAL CANCER PATIENTS AFTER PREOPERATIVE RADIOTHERAPY

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Radiation therapy has a critical role in the treatment of patients with various types of locally advanced cancer, including rectal carcinoma. It is recommended as a neoadjuvant therapy in

order to downstage the tumor and decrease local recurrence rates. Magnetic resonance imaging is a modality of choice in the examination of patients who have undergone radiation therapy. The aim of this study is to investigate the MRI morphology of the pelvic structures in patients with rectal cancer after neoadjuvant radiotherapy. The use of radiation therapy often affects not only the tumor but can lead to adverse effects in the tumor-free adjacent structures as well. Rectal wall thickening and fibrotic transformation of perirectal connective tissues and facias should be differentiated from vital tumor tissue. Differences in signal intensity due to the conversion from hemopoietic to fatty bone marrow can mimic metastatic bone disease. Various radiation-induced lesions at different anatomical sites can occur as genitourinary, gastrointestinal or musculoskeletal complications and have to be discriminated from normal anatomical variants.
Changes in the normal MRI appearance of the rectal and perirectal structures such as differences in signal intensities can often be misdiagnosed and mistaken for local tumor recurrence. Being familiar with the MRI appearance of expected normal post-radiation changes in the pelvis region is essential for the proper interpretation in order to avoid pitfalls and improve the diagnosis and decision for further treatment of the patient.
KEY WORDS: MRI, pelvic anatomy, radiotherapy

AN ANATOMICAL VARIATION OF THE SUPERFICIAL PALMAR ARCH

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Superficial and deep palmar arches are formed between the two main arteries of the forearm – radial and ulnar. The superficial palmar arch (SPA) is formed by the ulnar artery and palmar superficial branch from the radial artery. Different patterns of formation of SPA, divided into the arch type and non-arch type are reported in the literature. In the non-arch type, there is no anastomosis between the ulnar and the radial artery, while in the arch type, we observed anastomosis between them.
During routine dissection course on upper limb, we observed 12 extremities in formalin-fixed cadavers. We found unilateral anatomical variation of superficial palmar arch in one cadaver.
The non-arch type of SPA that we found have two independent artery – the ulnar artery that supplies the whole of the superficial palmar irrigation, but in the presence of a small radiopalmar artery ending at the level of the thenar muscles. The incidence of the incomplete SPA varies between different studies and is reported to be between 10% and 21.47% of cases. Clinically the anastomosis between radial and ulnar arteries in hand is of great significance when performing surgical procedures on hand, forearm or on individual arteries.
With increasing rate of high energy trauma and hand surgery, the knowledge of the SPA variability as a dominant vascular structure of palm becomes essential.
KEY WORDS: superficial palmar arch, ulnar artery, radial artery

ANATOMICAL VARIATIONS

ORAL PRESENATIONS

VARIATIONS IN THE ORIGIN, COURSE, AND LUMEN OF FACIAL ARTERY

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The origin and the course of facial artery are well-known and depicted by many authors. The results of the different studies are not identical. The last fact is due to the ethnic and individual differences as well as to the methods of the investigations. Facial artery is one of the main arteries supplying the face and the detailed description of its beginning, course and diameter are of essential significance for the surgical procedures in this area. In this study of 59 embalmed cadaver hemiheads we have initially observed the origin of the facial artery from the external carotid and followed its course on the neck and face. The availability of superior and inferior labial branches and the accompanying facial vein are registered. In 3 (2.5%) cases superior labial and in 4 (3.3%) cases the inferior labial are forming mesh. In 3 (2.5%) hemiheads the facial vein is missing. Normal single origin of facial artery from the external carotid is in 50 (84.75%); common origin with lingual a. in 8 (13.56%) and in 1 (1.69%) case there is a common stem with the superior thyroid a. The ignorance of the variety of the blood supply of the face could be crucial especially with the increased cosmetic procedures in that region. The present study clarifies the morphology of the facial artery, which helps to prevent failures during different procedures on the face.

KEY WORDS: human anatomy variations, facial artery, plastic surgery procedures

ELECTRONIC POSTERS

GENERATION OF THREE-DIMENSIONAL IMAGES OF SKULLS WITH ANATOMICAL VARIATIONS

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Three-dimensional (3D) images of skulls can be generated by different imaging technologies. They can be volume or surface ones and have different advantages and disadvantages depending on the used technology and the specific parameters of their generation. Volume images enable a non-destructive analysis and examination of "hidden structures" by sectioning in the virtual space. These images can be produced by medical imaging technologies (e.g. computed tomography), which provide the possibility for studies on living individuals. In contrast, surface models provide data only for the surface of the object, but can yield information about the texture. These models can be generated by different technologies (e.g. laser scanning, photogrammetry) or segmented from volume images resulting in files with a smaller size. However, such models are useful in studies when only data characterizing the surface are analyzed. Both types of images can be organized in virtual anatomy collections and used for digital morphometric and morphoscopic analyses. The 3D models allow various simulations in a virtual environment as well as visualization of similarities and dissimilarities in the morphology of certain structures via different software and tools. An advantage of the 3D models is also the opportunity for subsequent measurements and observations at any time. Besides, the models could be scaled and materialized at a chosen size by 3D printing.

Acknowledgement: The study was supported by the National Science Fund of Bulgaria, Grant DN11/9-15.12.2017.

KEY WORDS: skull, anatomical variation, 3D image

A CASE OF ATLAS ASSIMILATION IN A METOPIC SKULL

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Atlantooccipital fusion is a congenital osseous abnormality in the craniovertebral junction. Assimilation of the atlas may cause orthopaedic

problems and occasionally to induce neurological issues. In this study we report a case of atlas assimilation in a contemporary adult male skull. The 1st cervical vertebra was fused with the occipital bone. Both lateral masses were ossified to the occipital condyles. The posterior vertebral arch was complete and entirely fused with the occipital squama, whereas there was a small aperture between the anterior arch and the clivus. Both transverse processes were normally developed, enclosing the transverse foramina. The right transverse process was fused with the occipital bone, while the left one was free. An observation of the neurocranium revealed additional anatomical variations. The skull had a persistent metopic suture and a preinterparietal bone consisting of few separate bones of different size, occupying the upper triangular portion of the occipital squama. A remnant from the mendosal suture was also visible on the left side. Os epiptericum spurium totum peritemporale was found at the right pterion. The skull was scanned using industrial micro-CT system. The cranial base angle measured between the landmarks nasion, sellae and basion indicated basilar kyphosis (119.59°). The foramen magnum dimensions were slightly enlarged (length 41.7 mm; breadth 35.6 mm) compared to the mean values in contemporary Bulgarian males. All paranasal sinuses were well-developed.

Acknowledgements: This study was supported by the National Science Fund of Bulgaria, grant DN11/9-15.12.2017.

KEY WORDS: atlas assimilation, persistent metopic suture, dry skull, anatomical variations

PHYSICAL AND PALEOANTROPOLOGY

ELECTRONIC POSTERS

CHARACTERISTICS OF SKIN-FAT WRINKLE THICKNESS IN YOUNG GIRLS

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The aim of the investigation is to study the measurement of the thickness of the skin fat folds
of the back, chest, and abdomen in Azerbaijani girls. Caliperometry determined the characteristics of the thickness of the skin folds in girls 16-17 and 18-20 years. According to the study, the thickness of the skin on the back of 16-17 years old girls was 1.08 times less than 18–20-year-old. This means that in girls 16-17, the individual minimum and maximum values of this indicator are lower than in 18-20. In 16–17-year-old girls, the thickness of the skin and fat folds in the chest is 0.3 mm more than in 18–20-year-old girls compared to these parameters. The results show that in 16–17-year-old girls, the individual minimum value of this parameter is less than the corresponding value in 18–20-year-old girls and vice versa, it is higher than the individual minimum value in 18–20-year-old girls. Research shows that in young girls, the thickness of the skin and fat folds of the abdomen tends to increase in the transition from 16-17 to 18-20 years, and this increase is -1,6 mm. In 16–17-year-old girls, the individual minimum value of this indicator is lower than in 18–20-year-old, and the individual maximum value is higher.

KEY WORDS: bioimpedansometry, girls physical development, somatotypes

VARIA

ELECTRONIC POSTER

α-SMA EXPRESSION IN THE ANTERIOR CRUCIATE LIGAMENT IN HUMAN

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The aim of the present study was to determine the α-SMA expression in the anterior cruciate ligament in human. Several pieces were taken from the mid-substance of the anterior cruciate ligament of the knee joint from 7 cadavers (3 females and 4 males). In the anterior cruciate ligament clearly could be distinguished the ligament part, as well as the epiligament tissue enveloping the ligament tissue. The epiligament was consisted of fibroblasts, fibrocytes, adipocytes, neuro-vascular bundles and numerous multidirectional collagen fibres. The ligament proper had typical characteristics for the tissue and was poorly vascularized and hypo-cellular than to the epiligament. α-SMA expression was observed in the ligament tissue, as well as the epiligament of the anterior cruciate ligament. In conclusion, this study illustrated the α-SMA expression in ligament proper, as well as epiligament tissue in the anterior cruciate ligament, which may play a role in tissue homeostasis or affect healing process.
KEY WORDS: anterior cruciate ligament, α-SMA, human

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