

# **Papers**

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#### CLINICAL ANATOMY OF THE NECK IN USG PATTERNS

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Ultrasonographic patterns were presented, which might be critical for differential diagnosis and determining advancement of head and neck pathology. The studies were performed using Aloka 1100 apparatus equipped with a linear 7.5 Hz head. Advantages of the test include the fact that the test is performed in real time, i.e., the obtained result reflects current condition of the studied organ, it is non-invasive, safe, reproducible and painless. The studies were performed on patients treated in the Department of Maxillofacial Surgery, University School of Medicine in Poznań. Three groups of patients were distinguished, including patients with developmental malformations of the neck, patients with inflammatory processes in the region and patients with tumor metastases to lymphatic system. In the first group, USG patterns of lateral and median cervical cysts were presented, representing remains of brachial clefts and thyrolingual duct. In the ultrasonographic patterns, the cysts manifested as clearly delimited spheric or oval hypoechoic structures, the shape of which was modelled by the surrounding muscles. The lateral cervical cysts were present along the frontal margin of the sternocleidomastoid muscle. On the other hand, the median cyst was strongly bound to the shaft of hyoid bone, which in several cases required removal of the hyoid bone shaft together with the cyst. Ultrasonographic pattern of external carotid artery with disproportionately widened meanders of a very twisting course corresponded to aneurysms. Ultrasonographically, abnormal veins proved to be much more difficult to detect due to their thin and flaccid walls, which collapsed under a slight pressure of the head. Obviously, in such cases the use of Color Doppler function was indispensable, permitting to visualize blood flow in the studied vessel allowing to appraise quality of the flow and to quantitate it. The second group provided images of suppurative and inflammatory pathology in the neck. Most frequently, it stemmed from acute and chronic suppurative periodontal processes. Infrequently, the origin involved a salivary gland or infected hematoma. The lesions could transform gradually into cervical and thoracic empyema. The third group included cancer patients with metastases to cervical lymph nodes, graded N1-N3. Within the head and neck squamocellular cancers formed the dominating subgroup (over 90% tumors), with metastases spreading mainly by lymphatic vessels. For this reason, USG of the neck was important to evaluate stage of the disease and to establish TNM classification. In the examination, structure of a lymph node, its size and shape, profile of parenchyma, presence of lymph node hilus, pattern of lymph node capsule and relation to the surrounding structures, mainly to the neurovascular fascicle, were taken into account. Number and traits of the lymph nodes determined the scope of operation, combined treatment and prognosis of the disease course.

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#### TYOLOGY AND VARIABILITY OF DIMENSIONS OF CAECUM AND APPENDIX IN THE HUMAN INDIVIDUAL DEVELOPMENT

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The aim of the study is the determination of typology of caecum and appendix in prenatal and postnatal human ontogenesis. The anatomical preparation of abdominal cavity was performed in 272 foetuses (136 female subjects and 136 male subjects), whose ages ranged from 4 to 9 months of pregnancy, and 213 subjects, whose ages ranged from 4 to 65 (107 female subjects, 106 male subjects).

The highest length and width of caecum, the width of external ileocaecal orifice, the highest width of appendix base and the length of appendix were determined in situ. Shapes of caecum and appendix with respect to its long axis were determined. Their sceleotopy, syntopy and relation to peritoneum were also studied.

In the prenatal period caecum has C-letter-like shape and the frequency of this type of shape exceeds 62%. In children caecum increases mostly in the longitudinal dimension, and only slightly in the horizontal dimension, resulting in the change of its shape into L letter inclined to right. This type occurs with frequency from 30% in younger children to 59% in teenagers aged 16.

In adults the dimensions of caecum do not change significantly. After 20 years of life the visible right-hand bag-like shape of this part of bowel is observed (the shape still remains close to L, but with clear right-hand bag-like shape), with the frequency from 57% to 78% in adults.

In the examined group of foetuses ileocaecal orifice is located on the medial wall of caecum and with age move to the anterior wall. The angle of connection between two parts of bowels changes: in the prenatal period, in children and in young subjects the perpendicular connection predominates (mean 61%), and in the course of age the frequency of cases with acute angle connection increases (from 43% in subjects between 20 and 30 to 57% in subjects above 50). Small change in the position of caecum was observed.

Apart from the natural process of descending of caecum in prenatal period, in the postnatal period it is located in the right iliac fossa with frequency amounting to 80%. Only in 9.7% of subjects the appendix projects on McBurney's point and in 23% on Lanz's point. The higher position of appendix in adults was observed in 76% of cases. It is often covered by loops of small intestine. In the prenatal and postnatal period the caecum lies extraperitoneally without mesentery (frequency 88–92%). Mobile Caecum was observed in 7–10% of cases, and all of them were connected with postnatal phases of development. Appendix always lies intraperitoneally, and its mesoappendix develops from final phases of perinatal development to 10 years of live.

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#### THE USE OF ULTRASONOGRAPHIC EXAMINATION IN CURRENT ANATOMICAL EDUCATION

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In this paper we present the use of ultrasonographic examination in anatomical education of first year students of Medical University of Warsaw, Poland. Nowadays the USG examination becomes standard in diagnostic procedures in the majority of patients. Thus during human anatomy course in our Department we are trying to introduce also the elements of clinical anatomy along with classic preparation classes.

USG exercises are held during the abdomen chapter and last for 1 hour for each student group. USG workroom in our Department is equipped in USG apparatus with doppler mode, acquisition set with printer and video recorder and 8 monitor screens. In the first step students are introduced to basics, potentials and indications of usg technique. This introduction is done by radiologist on the basis of didactic panels. In the second phase one or two volunteers after signing the consent are examined. During the examination the following structures are shown: liver with gall bladder, portal vein, hepatic veins and their ending in inferior vena cava, then abdominal aorta with its branches, pancreas with splenic vein, kidneys with their vessels, spleen and if available uterus in women and prostata in men. The exercises end with visualization of heart and its structure.

In our assumption USG exercises are not only to introduce to first year students the fundamental these days way of diagnostic imaging, but in the first place help in better understanding the topographic relations of abdominal structures, what is often difficult in learning from the books or even on specimens. In our opinion implementation of elements of clinical anatomy might only bring out the better preparation for further clinical practice and could be the very good introduction to Medical Imaging classes on last year of studies.

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#### DIGITAL RADIOGRAPHY IN CLINICAL PRACTICE AND EXPERIMENTAL STUDIES

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Digital radiography is a new imaging diagnostics technique used in numbers of medical diagnostic procedures to examine human body. Presently it is widely used especially in breast and teeth examinations. Digital image recording system allows better evaluation of the differences between various tissues and organs as opposed to the conventional radiograms. The aim of the study was presentation of usefulness of the method in experimental studies to evaluate bone ossification in rodents. The material comprised rodent fetuses and neonates that were radiologically examined using the Digora-Soredex digital radiography system and the Planmeca Intra intraoral X-ray machine. Bone ossification was measured by means of the Digora Version 2.0 software in the form of density that is level of grey assigned to pixels of digital radiograms corresponding to attenuation of X-rays. The results of the studies show that the method is valuable in assessment of bone ossification measured as a bone pixel density, in experimental studies in rodent fetuses and neonates.

Monika Cendrowska-Pinkosz

## ANALYSIS OF THE CURSE AND THE OSTIUM SMALL CARDIAC VEIN

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The studies were carried out on 150 human hearts in age from 15 to 82 years. 76% men's hearts and 24% women's have undergone the examination. The direct analyses were accomplished on the 50 hearts submitted to the post mortem examination. The remaining hearts were examined the corrosion method. Aim of work was estimation of morphology small cardiac vein. The small cardiac vein running along the back surface of the coronary sulcus would usually drained into the coronary sinus at its right side 86%. Cases of draining of the small cardiac vein into the middle cardiac vein were noticed (12%) or directly right atrium (1%). In 1% preparations running along the right margin in direction on apex of the heart.

In 30% of corrosion preparations it was not possible to get to the small cardiac vein with the help of corrosion. In 24% of dissection preparations it was not possible to get to the small cardiac vein with the help of dissection. It was observed the essential statistical dependence between the frequency of presence or absence of the small cardiac vein among women and men ( $p > 0,001$ ). In the examined group the percentage of men who did not have the small cardiac vein was six times higher than among the woman. There was no basis statistically significant dependence between in frequencies of occurrence or of lack small cardiac veins in dependences from used techniques.

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## JUGUM SPHENOIDALE MORPHOMETRY — ANATOMICAL ASPECTS OF SCULL BASE SURGERY TECHNIQUES IN TREATMENT OF PARASELLAR PATHOLOGIES

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The main purpose of the study was to measure 5 distances in the region of the upper surface of the corpus of the sphenoid bone in the aspect of transbasal neurosurgical approaches to sellar region.

The study was performed on 22 wet bony blocks taken from cadavers. Each bony block was perpetuated and measured.

Five distances were measured:

- A** — the distance between medial borders of the entrances to optic canals;
- B** — distance between lateral borders of the entrances to optic canals;
- CL** — distance between tuberculum sellae and left optic canal;
- CR** — distance between tuberculum sellae and right optic canal;
- D** — distance between tuberculum sellae and anterior margin of the sphenoid sinus.

The exactness of the measurement was 0.5 millimeter. The results were analyzed according to sex.

The results: the average distances without distinguishing sex: **A** — 18.13 mm; **B** — 29.5 mm; **CL** — 15.88 mm; **CR** — 15.25 mm; **D** — 13.88 mm. The results in sexes: male **A** — 19.5 mm; **B** — 30.5 mm; **CL** — 16 mm; **CR** — 16 mm; **D** — 13.5 mm; female **A** — 16.75 mm; **B** — 28.5 mm; **CL** — 15.25 mm; **CR** — 14 mm; **D** — 14.25 mm.

The knowledge of these distances and proper assessment of the anatomy of jugum sphenoidale region is crucial to operating on this area and making operations much safer.

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## ANATOMICAL CONSIDERATIONS CONCERNING CORONARY VESSELS ANOMALIES IN THE TETRALOGY OF FALLOT, ON THE BASIS OF CORONARY ANGIOGRAPHY

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Tetralogy of Fallot is one of the most frequently found, so called, cyanotic congenital heart diseases. Anatomically, it is also rather complicated defect, consisting of several congenital abnormalities of the heart and the great vessels. The disorders may be accompanied by irregularities concerning anomalous origin and course of coronary vessels. Tetralogy of Fallot is usually diagnosed in a child soon after birth, during physical examination, on the basis of clinical signs. Some times for the differentiation of the defect other diagnostic tests like: ECG, RTG, echocardiography, angiography, hemodynamics need to be used. The occurrence of abnormalities concerning anomalous origin and course of coronary vessels in children treated in the *Pediatric Cardiology and Cardiac Surgery Clinics* between 1990 and 2000, were subjected to analysis on the basis of echocardiographic and coronary angiographic tests. Basing on the bibliography and the mentioned studies, frequency and character of coronary vessels anatomical irregularities in children hospitalized in USD CMUJ and in other centers were compared. It has been noticed that the system of coronary vessels and the areas of myocardium supplied by them, essentially influences the type of corrective surgical procedure and risk of eventual postoperative complications.

Łukasz Chrzanowski, Kazimierz S. Jędrzejewski

## INTRAVASCULAR ULTRASOUND (IVUS) ASSESSMENT OF HUMAN AORTA MORPHOLOGY

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Intravascular ultrasound (IVUS) imaging is a recently developed percutaneous invasive technique of inserting high-frequency transducer into blood vessels on rotational catheter tip. It enables to obtain cross-sectional images of vessels, and to recognise three layers of vessel wall — intima, media and adventitia. In addition, IVUS has the unique ability, to differentiate the elastic type of artery from the muscular type. In the latter, internal and external elastic membrane images can be acquired. This technique has also been shown to provide the potential for in vivo absolute measurements of wall thickness, artery cross-sectional diameter, artery cross-sectional area (CSA) or lumen cross-sectional area (CSA). Significant morphometric correlations were found between the paired measurements of arteries obtained from the post mortem histological sections and in vitro ultrasound images. However histological preparation methods and subsequent microtome cuts may produce difficulties for quantitative analysis. In clinical applications, IVUS provides the potential for validation of vascular pathology — arterial lesions, atherosclerotic plaques structure as well as for precise assessment of vessel wall response to percutaneous interventions, including stents implantation.

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Bogdan Ciszek

#### ON THE ANATOMY OF THE CORTICOSTRIATAL TRUNK OF THE MIDDLE CEREBRAL ARTERY

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Origin of the perforating branches from the early branches of the middle cerebral artery (MCA) was reported in many papers. However it was described as a relatively rare phenomenon. My own series of the lateral cerebral fossa dissection revealed this anatomical configuration in almost half of cases.

On the basis of the 100 microanatomical bilateral dissection of the middle cerebral artery it was stated in 45 cases (21 woman, 24 man). Such common origin of the perforating branch and the early branch of the MCA and early branch was called CORTICO STRIATAL TRUNK (CST).

A total of 59 CST were investigated. Origin was early frontal branch predominantly — 57 cases. Only two cases of early temporal branch was found in this group of CST.

Three patterns of CST were defined. With dominant cortical branch (33 cases), with dominant perforator branch (19 cases) and equal (7 cases).

Such common origin of the perforating branches of the MCA and early cortical branches of this artery has the great importance during dissection of the aneurysm of MCA which arose in the point of early cortical branch origin. Frequent technical steep during opening of the sphenoid compartment of the lateral cerebral fossa is to continue the dissection along one of cortical branches on the lower surface of the frontal lobe. Such arteries are branches of the early frontal branches of the MCA. Possibility to interfere with critical perforating branches is high.

Anna Czarnota, Piotr Szkodziak

#### FUZZY LOGIC — APPLICATIONS IN HUMAN BODY DIAGNOSTIC IMAGING

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The aim of this paper is to present the idea of fuzzy logic and reveal its usefulness in medical sciences, laying stress on its utilization in diagnostic methods connected with human organs imaging.

Intelligent systems have appeared in many technical areas, such as consumer electronics, robotics and industrial control systems. Many of these intelligent systems are based on fuzzy control strategies which describe complex systems mathematical models in terms of linguistic rules. Since the 1980s new techniques have appeared from which fuzzy logic has been applied extensively in medical systems. The justification for such intelligent systems driven solutions is that biological systems are so complex that the development of computerised systems within such environments is not always a straightforward exercise. Conventional mathematical methods based on theory of sets and binary logic are limited to describe all the complex phenomena connected with medical science. In practice, a precise model may not exist for biological systems or it may be too difficult to model. In most cases fuzzy logic is considered to be an ideal tool as human minds work from approximate data, extract meaningful information and produce crisp solutions. It is a great theory to use in the conditions of constant uncertainty. Fuzzy logic brings new possibilities into control, modeling, data analysis, diagnostics, decision making, and other working fields in biomedical sciences. Algorithms and artificial neural networks (ANNs) based on fuzzy logic have important potential applications in radiology as a means to identify structures and conduct measurements. Some recent applications have included the identification of areas of tumor and edema and the measurement of gray matter, white matter, and cerebrospinal fluid. A semiautomatic method based on fuzzy set theory was invented for adjusting a computerized brain atlas to magnetic resonance images (MRIs) of the human cerebral cortex, which evaluation revealed an increase in accuracy as expressed by a reduction of the visible mismatch with respect to the registration of cortical and subcortical brain structures (Berks et al.) In one of the studies fuzzy logic approximations were used in the method of visualization of nerve fiber orientation in gross histological sections of human brain (Axer et al.)

Unsupervised fuzzy clustering algorithm was used in the automatic segmentation method which separates non-enhancing brain tumors from healthy tissues in MR images to aid in the task of tracking tumor size over time. Tumor segmentation from magnetic resonance (MR) images may aid in tumor treatment by tracking the progress of tumor growth and/or shrinkage (Fletcher-Heath et al.) Another interesting utilization of the fuzzy connected object delineation principles and algorithms is a near-automatic process for separating vessels from background and other clutter as well as for separating arteries and veins in contrast-enhanced magnetic resonance angiographic (CE-MRA) image data. This method was tested on the pelvic region and the carotid system and compared with manual segmentation/separation was able to separate higher order branches, and therefore produced vastly more details in the segmented vascular structure (Lei et al.) Those are just few examples of how widely fuzzy logic can be used in any kind of human body imaging. Many studies have shown that it is an efficient, practical, fast and objective method and that fuzzy logic based algorithms and ANNs can be successfully used for the task of identifying structures in the human brain. Another aspect of discussed issue is that in our opinion further improvements in image communications and processing might likely result from suitable use of „Fuzzy Logic“. So although adaptation of fuzzy logic and ANN approach to structure identification is a challenging task and it is not without inherent limitations, in our opinion it might be worth to get to know with the subject a little closer.

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#### ANATOMY OF THE ANTERIOR CRANIAL FOSSA INJURY

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Fracture of the anterior cranial fossa usually involves many cranial compartments like orbit, nasal cavity, facial skeleton, sellar region. Force of impact is dispersed on the bony frame and soft tissues of the head so the brain injury is relatively limited.

Point of impact and force direction implies different effects of injury. We analyze 40 cases of the anterior cranial fossa injuries. Basing on anatomical knowledge of the area of interest, diagnostic imaging and surgery we describe three main mechanisms of the anterior cranial fossa injury.

Impact to the glabella destroy frontal sinus, ethmoid bone up to the planum sphenoidale, may involve medial orbit with optic canals and nasal liquororrhea is frequent.

Impact to the orbit frequently due to the rapidly rotating elements destroy eye ball, orbital roof and involve base of the frontal lobe with formation of the cerebral contusion or intracerebral haematoma.

Impact to the region of the fronto-zygomatic suture involve lateral orbit with superior orbital fissure. Frontal sinus may be destroyed but ethmoidal region may be intact.

These anatomical classification play important role in the planning of the surgical procedure for the anterior cranial fossa injury.

Tomasz Gładysz, Jadwiga Stypułkowska\*, Janusz Gorczyca, Jarosław Zawiliński, Tomasz Bereza, Jerzy Walocho, Andrzej Skawina

#### THE COURSE AND TOPOGRAPHY OF BRANCHES OF THE MAXILLARY DIVISION OF TRIGEMINAL NERVE AS THE BASE OF THE MOST COMMON LOCAL ANAESTHESIA IN STOMATOLOGICAL PRACTISE

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The main goal of the paper was the analysis of topographic relations of the most important anatomical nervous and vascular structures in the aspect of local anaesthesia in the maxillary region. In the paper we presented the course, topography and the range of innervation of the infraorbital, superior posterior alveolar, nasopalatine and greater palatine nerves. Considering the anatomical relations, we described the technique of nerve approach at the sites of their typical anaesthesia (blockages). The authors presented indications to these procedures and paid attention to possible complications that may result from incorrect performing of the procedure (iatrogenic) or non-specific anatomical construction (anatomical variability).

Tomasz Gładysz, Jadwiga Stypułkowska\*, Jerzy Walocha, Krzysztof Kulka, Janusz Gorczyca, Andrzej Gryglewski, Andrzej Skawina

THE COURSE AND TOPOGRAPHY OF RAMIFICATIONS OF THE MANDIBULAR DIVISION OF TRIGEMINAL NERVE IN ASPECT OF MOST COMMON LOCAL ANAESTHESIA IN STOMATOLOGICAL PRACTISE

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The aim of the paper was the analysis of the most important topographic relations of the anatomical nervous and vascular structures in the aspect of local anaesthetics in the mandibular region. The paper presents the course, topography and range of innervation of the inferior alveolar, lingual, buccal and mental nerves. Considering the anatomical relations, the technique of approach to these nerves in their typical sites of anaesthesia (blockages) was described. The authors also presented the indications for these procedures and pointed out possible complications resulting from inappropriate mode of their performance (iatrogenic) or non-specific anatomical construction (anatomical variability).

Tomasz Iskra, Marek Sajewicz, Jerzy Walocha, Tomasz Gładysz, Krzysztof Kulka, Tomasz Berezka, Andrzej Skawina

THE COURSE OF IMPORTANT ANATOMICAL STRUCTURES IN ASPECT OF MOST COMMONLY CARRIED OUT PROCEDURES IN NEUROLOGICAL ANALGESIA. THE LATERAL FEMORAL CUTANEOUS NERVE

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The aim of the paper was to present the technique of conduction anesthesia of the lateral femoral cutaneous nerve according to topographic relation of this nerve. The paper presents the course, topography and range of innervation of the lateral femoral cutaneous nerve. Considering the anatomical relations, the technique of nerve approach was described, concerning the most common place of its block. Indications to that procedure and possible complications were also presented.

The lateral femoral cutaneous nerve (L<sub>2</sub>-L<sub>3</sub>) originates from the lumbar plexus, is a typical sensory nerve and innervates the skin of the lateral aspect of the thigh. Injection of analgesics are usually performed medial to the anterior superior iliac spine in the fan-mode, towards the medial direction. Indication to that procedure is most commonly taking the graft from the skin in burned (block together with the femoral nerve) and diagnostics and treatment of neuralgia of this nerve (neuralgia paresthetica). Complications are rare, usually they have a form of temporary or permanent injury of the lateral femoral cutaneous nerve followed by diminishing or loss of sensation from the skin of lateral femoral region.

Tomasz Iskra, Jerzy Walocha, Krzysztof Kulka, Ewa Mizia, Agata Musiał, Tomasz Gładysz, Andrzej Skawina

THE COURSE OF IMPORTANT ANATOMICAL STRUCTURES IN ASPECT OF MOST COMMONLY CARRIED OUT PROCEDURES IN NEUROLOGICAL ANALGESIA. THE INTERCOSTAL NERVE

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The aim of the paper was to present the technique of conduction anesthesia of the intercostal nerve according to topographic relation of this nerve. The paper presents the course, topography and range of innervation of the intercostal nerve. Considering the anatomical relations of the intercostal space, the technique of nerve approach was described, concerning the most common place of its block. Indications to that procedure and possible complications were also presented.

The intercostal nerve is the ventral primary branch of the spinal thoracic nerve. 12 pairs of intercostal nerves (Th<sub>1</sub>-Th<sub>12</sub>) run around the corpus (preserving segmental character) and supply the thoracic and abdominal muscles, the skin of antero-lateral aspect of the body. To obtain full anesthesia the block of an intercostal nerve should be carried out about 8-10 cm lateral from the median posterior line of the body. Indications to the local (conduction) anesthesia of the intercostal nerve are as follows: removal of postoperative pain, costal fractures and injuries, chronic pain (i.e. herpes zoster infection), pleuritis, pleural suction. Rare, but typical complication is pneumothorax.

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COMPARISON OF TRABECULAR BONE STRUCTURES IN TYPE I AND TYPE II OSTEOPOROSIS BY IMAGE ANALYSIS

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The aim of the study was to quantitatively evaluate the bone trabecular structure in type I (postmenopausal) and type II (senile) osteoporosis.

The study was carried out on transiliac biopsies from patients with postmenopausal osteoporosis (10 biopsies) and senile osteoporosis (10) and on normal bone originated from autopsy (7). Microradiograms of bone specimens were processed into digital images by TV camera and ADC and were analyzed by use of dedicated software. The program binarises the images using so called autothreshold algorithm, i.e. the binarisation threshold is not fixed, but depends on the surrounding of the point (pixel) being binarised. Application of autothreshold allowed to recognize even least visible elements. Image binarised this way were eroded using horizontal and vertical elements in order reveal the structure of longitudinal and transversal trabeculae. The following parameters were determined: the longitudinal trabecular area S(lt), transversal trabecular area S(tv), the ratio of the transversal and longitudinal area (d coefficient), trabecular bone volume BV/TV.

The values of S(tv) in both type I and type II osteoporosis are lower than in control group. The differences are statistically significant (Mann-Whitney test, p = 0.005). There are also statistical differences between the values of S(lt) in type II osteoporosis and control group (p = 0.005) but there's no difference between type I osteoporosis and control group. The d coefficient in type I osteoporosis is lower than in control group and senile osteoporosis.

The changes of bone trabecular structure of iliac bone proceed differently in postmenopausal osteoporosis and senile osteoporosis. Postmenopausal osteoporosis is characterized by reduction in transversal trabeculae mainly, while in senile osteoporosis the transversal trabeculae are reduced in similar degree as longitudinal. The structural anisotropy of trabecular bone in postmenopausal osteoporosis is greater than in senile osteoporosis and control group.

Jerzy Jankau

ABOUT ANATOMICAL CONSIDERATIONS WHEN RECONSTRUCTING NIPPLE/AREOLA COMPLEX OF THE BREAST

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As it is almost impossible to imagine Paris without Eiffel tower, there is no reason that breast, the most feminine part of woman's body will appear without, its characteristic ingredient — nipple/areola complex.

Currently vogue, fashion, culture and mostly society pressure expect from woman to have all ingredients of hers femininity. And what is most important from ages, as the polls proves, this tiny little part of theirs body attracted, attract and hopefully will for a long time attract our males attention.

Reconstruction of nipple/areola complex remains the last step of complex process of breast reconstruction followed mastectomy. This procedure is done after recreation of the breast mound. But to have this process done satisfactory it has to be remembered few anatomical considerations. They are as follow (1) anatomy of the trunk, (2) texture and pigmentation of the breast skin, (3) erectile properties of the areolar muscle, (4) projection of the nipple, (5) diameter of the nipple, (6) sensory innervation, (7) ductal function.

This process usually is carried out in two steps. The goal is to reconstruct the nipple with most effective and fixed position and to match the color of the areola close to the one from the other site. There are vast array of techniques available for nipple/areola reconstruction, but the way in which it will be done is still in surgeon's hands. Similarly is with reconstruction of areola, but intra-dermal tattooing with variation in color become very helpful.

Janusz Jerzemowski

THE ANATOMICAL PICTURE OF PANCREAS TRACT BASED ON ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY CONCERNING EXAMINED PATIENTS HAVING DILATATION OF BILIARY TRACT

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Endoscopic Retrograde cholangiopancreatography combines the advantages of both endoscopic and radiological examinations as it shows morphology, pathology and physiology of pancreas and pathology of biliary system.

The examinations were performed on the group of 30 chosen inpatients. The diagnosis made on the basis of Ultrasonography examination showed the pathology of biliary system — dilatation of biliary tract. In all 30 cases it was possible to visualize both pancreas tract and biliary system. On the basis of examinations it was possible to find out 13% of inpatients suffer from lithiasis of biliary tract, stenosis of Wirsung's duct — 6%. The presence of chronic, pancreatic changes was confirmed in all patients.

Konrad Janowski, Witold Sławiński, Małgorzata Czupryniak-Sławińska, Mirosław Topol

ANATOMICAL ESTIMATION OF A MAJOR SAPHENOUS VEIN OSTIUM DURING SURGICAL OPERATIONS IN PATIENTS WITH CHRONIC VEINS INSUFFICIENCY ACCORDING TO CEAP SCALE

Samodzielna Pracownia Angiologii przy Katedrze Anatomii Prawidłowej AM w Łodzi oraz Zakład Opieki Zdrowotnej „TERAPIA”

The aim of the study is the estimation of sapheno-femoral ostium in patients with different degree of chronic veins insufficiency in CEAP scale, during operation procedure. We assume that the type of major saphenous vein, its diameter also the number and diameter of tributary veins are to be examined.

The assumption of correlation between the type of an ostium and diameter of major saphenous vein and the frequency that chronic veins insufficiency appears. From 13.12.2001 to 30.06.2002 there were performed 50 surgical operations in patients suffered from varicose veins. Every procedure was prefaced by a doppler ultrasonography imaging. The varicose veins were operated using Babcock's method. There were 5 groups of patient with different degree of CVI. There are: C2-s group (11 cases), C3-s group (21 cases), C4-s group (11 cases), C5-s group (1 case) and C6-s group (6 cases) in CEAP scale.

The sapheno-femoral ostium, tributary veins and 15 cm of major saphenous vein were visualized.

We have taken several parameters to assess and describe that network of veins in the sapheno-femoral area. We have measured such parameters as: diameter of major saphenous vein, type of an ostium, number and diameter of tributary veins and also distance between the ostium and those veins.

After analyzing those parameters we have concluded that:

1. There is a correlation between the diameter of an ostium and the degree of CVI.
2. We were able to describe 5 types of sapheno-femoral ostium.
3. The diameter of tributary veins correlates with the degree of CVI.
4. The operation procedure should be held very conscientiously in order to visualize and cut off all the tributary veins, because this can stop the recurrence of varicose veins.

Janusz Jerzemowski

CYSTIS RENIS — HISTOLOGICAL AND ULTRASONOGRAPHIC CORRELATIONS

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In kidneys often occur single or multiple cystis of different sizes. Some of them are the consequences of acquired illnesses of renis causing the damage of renis function.

A significant meaning in the diagnosis of cystis renis have the Ultrasonography and Tomography examinations.

The aim of the paper was to show the correlation between morphological picture of cystis renis; 21 inpatients with singular big renis cystis and multiple cystis renis were examined.

Because of following doubts 8 inpatients were operated:

- impression of cystis on the urinary tract,
  - suspected infection of cystis,
  - increase of cystis in following examinations showed by ultrasonography.
- In the resected cystis the cancer cells were found. That state was not suggested by ultrasonography.

Damian Jeżyk<sup>1</sup>, Marek Grzybiak<sup>2</sup>

TRABECULA CARNEA „SEPTALIS” AND ITS RELATIONSHIP WITH SEPTAL PAPILLARY MUSCLES IN THE RIGHT VENTRICLE OF HUMAN AND OTHER MAMMALS HEARTS

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Papillary muscles are being named by its characteristic shape. There are muscle structures of various sizes, and from them run tendinous cords directly to atrioventricular valve. The right ventricle septal papillary muscle group is characterized by the fact that except the most important muscle — so called *coni arteriosi* muscle, there are also small, often underdeveloped muscles. In this case tendinous cords are standing out directly from interventricular septum. In the sphere of those muscles there were found structures with particular, untypical texture. In scientific research material which contains 111 human hearts and to be compared also 188 hearts of other mammals (36 *Primates*, 19 *Carnivora*, 88 *Ungulata*, 41 *Lagomorpha*, 2 *Rodentia*, 2 *Marsupialia*), there were distinguished 16 hearts (5,35%) with septal muscles that did not run directly from septum, but along its surface, horizontal or diagonal trabecula carnea, in one case (gibbon) from horizontal cord. Trabecula ran from supraventricular crest about in the half of the interventricular septum height and ran towards of the ventricle back angle. It ended in the further part of septum or nearby the posterior papillary muscle. There were tendinous cords that ran from “septal” trabecula up to the septal leaflet of tricuspidal valve. Such a view was observed only in the *Primates*: in 12 human hearts and in 4 hearts of the *Catarrhine* monkeys.

Inner surface of the heart ventricle under examination is characterized by the highest amount of trabecula carnea just among the *Primates*. Usually they lay in the lower, namely in the apical part of the ventricle. “Septal” trabeculas, from which tendinous cords are coming out to tricuspidal valve are being placed upmost.

Walery Jurczenko

VARIABILITY OF THE PANCREAS SHAPE

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On the 100 cadavers shape of the pancreas was investigated. Four variations were identified: hammer-like, club-like, band-like and s-shaped. Frequency of these variations was related to general constitution of the human body.

In mesomorphical type : hammer-like 56,43%, club-like 30,12%, s-shaped 9,27%, band-like 4,18%.

In brachymorphical type: hammer-like 47,11 %, club-like — w 44,32%, s-shaped — w 6,46%, band-like 2,72%.

In dolichomorphical type: hammer-like 20,46%, club-like 18,24%, s-shaped 49,16%, band-like 11,14%.

Pancreas shape was different in males and females. In males hammer-like (52,33%) and club-like (36,16%). In females hammer-like 28,71 % and club-like 14,60% while s-shaped 46,15% and band-like 10,54%.

Shape of pancreas was also related to general topography of the abdomen. In normal position of the viscera hammer-like 34,12% and club-like 39,40%. With visceroptosis s-shaped 42,2% and band-like 21,3%.

Kazimierz S. Jędrzejewski, Ewa Okraszewska, Ilona Cendrowska

THE INTRATESTICULAR LYMPHATIC NETWORK IN MEN

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This study concerning the existence of an intratesticular lymphatic network was undertaken due to the difference of opinion among certain authors as to its presence and its structure within the human testis.

Material used in this study comprised of microcorrosive specimens of intratesticular lymphatic vessels. Injecting plastic mass (Mercox® 2b) filled these vessels. 10 corrosive specimens of intratesticular lymphatic network in human gonads were prepared. The lymphatic networks were examined using electron-scanning microscope.

The lymphatic drainage of the testis was described and illustrated by the early anatomists, but there was a lively controversy about the nature of the system inside the testis. In our investigations the presence of intratesticular lymphatic vessels was established in human male gonads. In all gonads the lymphatic network was located within the tunica albuginea. The initially lymphatic vessels within the testicular parenchyma are forming a loose, irregular network; their lumen is slit-like, with a flattened appearance on cross-section. In the deep parenchyma, the peritubular lymphatic spaces surrounding the tubules were observed as polygonal piles after corrosion casting to the testis. We have found that from the inside of the testes the lymphatic vessels make their way, towards the tunica albuginea, to spermatic cord where they form larger diameter lymphatic trunks. In human testis the subtunica lymphatic spaces anastomosed to each other through small bypasses to form a rich network.

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Wit Juśkiewicz, Andrzej Dąbrowski, Andrzej Drop, Ryszard Maciejewski

RADIOANATOMICAL STUDY OF THE RARE TYPES OF FORMATION OF GASTROPANCREATICOCOLIC VENOUS TRUNK

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In 1868 Henle described the venous trunk formed by the right gastroepiploic and right superior colic veins which enter into the superior mesenteric vein. Later, Descombes and Lalaubie added to this the antero-inferior pancreaticoduodenal vein, and other authors have reported different combinations of the veins, emptying jointly into the superior mesenteric vein [1, 3]. The object of this investigation was to contribute to the study the description of rare types of formation of this trunk. Material and methods: Forty complexes of abdominal organs obtained from patients after sudden death (36 male, 4 female). The only criterium was any evidence of previous abdominal operation. Organ complexes included stomach, duodenum, colon, minor et major omentum, portal vein, mesojejunum, pancreas and spleen. The evaluation of tributary of superior mesenteric vein with venous trunk consisted of two parts: anatomical study — portal vein with tributary were dissected and anatomic evaluation was carried out, radiological study — portography was made after injecting contrast medium (uropoline) into portal vein. Results and discussion: Among 40 specimens in two cases we found two variants with five tributaries of gastropancreaticocolic trunk non described before. In one case this trunk was formed by: right gastroepiploic vein, antero-inferior pancreaticoduodenal vein, right colic vein, pyloric vein and right gastric vein. In second case the tributaries found were: right gastroepiploic vein, antero-inferior pancreaticoduodenal vein, right superior colic vein, right inferior colic vein and pyloric vein. From the surgical viewpoint, it is important to be well acquainted with the topography of this venous trunk and the variations in its formation. In medical imaging, dilatation of tributaries of this trunk, especially the right gastroepiploic vein, is an indirect sign of pathology of the splenic vein. Moody has reported that dilatation of the right gastroepiploic vein is a reliable sign for diagnosis of occlusion of the splenic vein, caused by acute pancreatic diseases [2].

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#### SPONTANEOUS SPLENORENAL ANASTOMOSIS IN A CASE OF CIRRHOSIS OF THE LIVER

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The portal hypertension is caused by the obstruction of portal venous blood flow through the liver. It results in alternative pathways for the blood to flow systemic circulation. The most common cause of portal hypertension is postinflammatory or alcoholic cirrhosis. A common way of reducing portal pressure is to divert blood into the systemic venous system. The most important clinically is the gastroesophageal region.

Female patient was hospitalized several times due to bleeding from the upper digestive tract and secondary anemia. Clinical and laboratory examinations revealed cirrhosis of the liver. CT showed well developed spontaneous splenoportal anastomosis (blood from the splenic vein 1 cm in diameter flows to the left renal vein 1,49 cm in diameter). Gastroscopy revealed varices in cardiac region and fundus of the stomach.

There are four portasystemic anastomoses: 1) esophageal connecting left gastric vein and azygos venous system via periesophageal plexus, 2) rectal connecting inferior mesenteric vein and common iliac vein via rectal plexus, 3) paraumbilical connecting femoral vein and subclavian vein via superficial epigastric vein and thoracoepigastric veins, and 4) retroperitoneal between the portal and systemic venous systems, where retroperitoneal organs contact posterior abdominal wall.

The common method for reducing portal pressure is to divert blood from the portal to the caval system by vascular surgical shunts, like *spleno-renal*, *mesenterico-caval* or *porto-caval* ones. However, decreased blood flow through the liver elevates ammonia concentration, leading to so called hepatic encephalopathy. The portal hypertension may also be compensated by dilation normal, fine, venous anastomoses between splenic and left renal veins [2]. The presented case exemplifies such spontaneous decompression of the portal vein. There are a few reports in literature, related to spontaneous anastomoses in advanced cirrhosis of the liver [1]. However, it seems, that such shunts are not sufficient to decompress the portal hypertension and to diminish or eliminate hemorrhages from the esophageal varices.

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#### APPLICATION OF IMMUNOMAX TECHNIQUE FOR DETECTION OF C AND NS3 PROTEINS IN PATIENTS WITH CHRONIC TYPE C HEPATITIS

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In a precise morphological diagnosis of chronic type C hepatitis techniques of molecular biology are employed, including immunocytochemistry and *in situ* hybridization used with product amplification techniques (PCR with its varieties, ImmunoMax). The study aimed at detection of two proteins of hepatitis C virus (HCV), C and NS3 in liver biopsies obtained from adults (n = 12) and from children (n = 6) suffering from chronic type C hepatitis. The classical ABC technique (with avidin and biotinylated peroxidase complex) and the ImmunoMax technique (amplification with biotinylated tyramine) were used. The studies were performed on formalin-fixed, paraffin-embedded archival tissue material obtained from patients with a confirmed infection with HCV (with HCV antibodies and HCV-RNA positive in the serum). The classical ABC technique permitted to detect NS3 protein in 11/12 adults and in all children (n = 6) but the product of immunocytochemical reaction was poorly visible. Protein C could not be detected in any of the patients. The ABC technique accompanied by amplification with biotinylated tyramine (ImmunoMax technique) allowed for detection of both C protein and NS3 protein in all the patients. In the patients the immunocytochemical reaction aimed to detect NS3 protein involved higher numbers of cells. Our studies demonstrated cytoplasmic localization of both proteins with variable number of positive cells, depending upon the studied biopsy. Localisation of the proteins in hepatocyte cytoplasm dominated. In children more frequently than in adults, positive reactions for both proteins were observed also in individual cells of inflammatory infiltrates and in macrophages of hepatic sinusoids. As compared to the classical ABC technique, application of the ImmunoMax technique proved to be much more sensitive in detection of HCV proteins.

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#### DOES THE SEVOFLURANE INFLUENCE THE ASTROCYTIC REACTION IN THE COURSE OF THE EXPERIMENTAL INTRACEREBRAL HEMORRHAGE IN THE RATS?

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Intracerebral hemorrhage is an intense stimulating factor initiating sequential reaction of the surrounding neural tissue. Apart from the brain edema and disruption of blood-brain barrier, strong activation of the glial cells is one of the most important factors influencing the extent of neurological deficits. The morphological features of the astroglial reaction to the experimental hemorrhage were investigated in rats anaesthetized with sevoflurane administered in 2.2 vol % concentration. The control group was anaesthetized with dehydrobenzperidol and fentanyl administered intraperitoneally. 20 adult rats were used in the study. An experimental intracerebral haematoma was produced by the injection of 100 µl of autologous whole arterial blood into the striatum during the period of 5 min. Continuous monitoring of the mean arterial blood pressure, intracranial pressure and body temperature was performed. All parameters did not reveal significant differences in comparison to the control group. Immunoreactivity (ir) to GFAP was studied. The morphological evolution of the astroglial reaction was studied in the animals sacrificed after the survival period ranging from 1 to 21 days. The confocal microscopy was used for evaluation of the results. Intense astrocytic activation is observed in the studied period, starting from the third postoperative day. Both morphology and number of activated astrocytes change characteristically. The activated GFAP-ir astrocytes are enlarged, with thick, intensively stained processes. Time-dependent character of reaction is reported, with the highest number of activated cells at the end of the second survival week. The reaction seems to be less strongly expressed in the group treated with sevoflurane in comparison to the control group.

The decreased intensity of astroglial reaction may be explained by the cytoprotective properties of sevoflurane. These properties concern mainly the influence of this agent on the regional blood flow, amount of the excitatory neurotransmitters and on the reduction of Ca<sup>++</sup> concentration in the perihematoma region. Consequently, the volume of the tissue injured in the course of hematoma is reduced, which may result in better clinical outcome.

Jerzy Kisielewski

#### VASCULARISATION OF THE SYNOVIAL JOINTS OF THE LOWER EXTREMITY

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Vascularisation of the synovial joints of the lower extremity play important role not only in normal conditions. It is clinically important topic in different pathological process, surgical procedures in postoperative period and during rehabilitation.

The goal was to show influence of the pathological genotype on the development and variability of the arteries of the lower extremity which supply the joints.

Material — 100 specimens of fetal and newborn lower extremities.

Methods — macro and micro dissection postmortem angiographies.

Results — in cases of trisomy 13, 18, 21 arterial system of the lower extremity was changed impressively. Main variations on the level of the hip joint was different origin of the obturator and circumflex femoral arteries. On the level of the knee joint it was unusual course of the anterior tibial artery. On the level of the talo-crural joint it was dominating fibular artery.

Conclusion — blood supply to the synovial joints of the lower extremity was hardly changed by pathological genotype. It reflects its importance to the pathology of the joints.

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EARLY DEVELOPMENTAL MALFORMATION OF THE ALIMENTARY TRACT IN THE FORM OF CYST OF MESENTERY OF THE SMALL INTESTINE

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The cyst of mesentery of the small intestine may be caused by: 1) partial duplication of the alimentary tract, 2) vitellointestinal duct remnants, 3) congenital anomalies of the lymphatic system, 4) failure of the axial part of the embryo in presomitic stage [1–4].

The aim of the study was to present a case of congenital cyst of the small intestine's mesentery, in 36 years old patient, with abdominal pains. Clinical examination suggested the tumor within abdominal cavity, 17 cm in diameter, and sonographic examination revealed cyst 16 x 11 cm in the right hypogastrium and mesogastrium. Surgical excision of the cyst was performed. The cyst derived from mesentery of the small intestine and was filled with the fluid. The histopathological examination showed that the wall of the cyst has the same structure as the wall of alimentary tract. Additionally the multilayered ciliated epithelium typical for the airways, was found as well as mucous membrane of the stomach and duodenum, were revealed in immunohistochemical tests.

Frequently the cysts of the intestinal mesentery are formed as result of lymphatic vessels abnormalities. Often such cysts are remnants of vitellointestinal duct. Improper obliteration of this duct may lead to formation of Meckel's diverticulum, vitelline fistula or vitelline cyst. Some cysts — so called — dorsal enteric cysts appear early in development, in places of fusion of embryonic endoderm and ectoderm of the future neural plate, this results in displacement or splitting of the notochord [1–4].

The wall of the examined cyst was composed of the muscular layer with epithelium typical for the oesophagus, stomach, duodenum and bronchi. Ectopic mucous membrane of the stomach was described by many authors within the oesophagus, Meckel's diverticulum, cysts of the oral cavity and within the colon. The presence of nervous tissue in the tongue was found as well the tissue resembling the kidney in the colon. The tissue resembling pancreas was described in the gastrointestinal tract and within the spleen and its capsule [4].

The phenomenon of heterotopy is explained by persistent, undifferentiated, multipotential cells and their improper organization. The described cyst, seems to be the result of an early presomitic embryonic developmental anomaly.

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COMPUTED MODELLING OF LIMB AXIS CHANGES IN CASE OF GROWTH PLATE INHIBITION

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The inhibition of the growth plate before finishing of its growth is a recognised method of the treatment in the case of the lower limb inequality. The aim of our study was to create the computed simulation of changes of the lower limb axis in the case of the femoral growth plate inhibition. We analysed unilateral and bilateral growth inhibition. For our analysis we used the method with completed elements with applying the simplified model of bones, mainly in the accordance to modelling of their material properties, considering growth processes as the kinematics force constraint. We estimated the influence of the screw localisation on lower limb axis changes. We obtained total computed image of the evolution of the lower limb axis changes according to the age of the growth plate inhibition and the size of the inhibited region of the growth plate.

Marek Kozień<sup>1</sup>, Jacek Lorkowski<sup>2</sup>

COMPUTED MODELLING OF KNEE JOINT AFTER ANTERIOR CRUCIAL LIGAMENT RECONSTRUCTION WITH AUTOLOGOUS GRAFT

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In case of posttraumatic lack of the biomechanically efficient anterior cruciate ligament for its reconstruction the autologous grafts from 1/3 medial part of the patellar ligament or grafts from the ligaments forming „goos foot” are usually used. The goal of this study was to create the biomechanical model of the knee joint after an uptake of these grafts. The analysis was made using computed system — ANSYS. On the ground of our analysis we have found unimportant impairment of the knee joint rotational movements in case of the anterior cruciate ligament reconstructed by „goos foot” elements. In case of the patellar ligament use for the reconstruction we have stated a little change of the knee joint extension movement. Our created model demonstrates that taking up of grafts from the patellar ligament or the „goos foot” is connected with changes of the initial biomechanics knee joint parameters. Greater changes of the values of the forces that act on the knee joint are stated in case of use of the „goos foot” elements as the grafts.

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COMPUTED MODELLING OF LONGITUDINAL FOOT ARCH IN SELECTED FOOT PATHOLOGIES

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One of the most important element responsible for supporting of longitudinal foot arch is the tibial anterior muscle. The correct tension of this muscle allows supporting of correct compactness of talonavicular joint. The main purpose of this study was to evolve a computed program simulating changes of the tibial anterior muscle tension and their influence on the foot longitudinal arch. In the study we took into account the different values of the tibial anterior muscle strength (1–5 according to Lovett's scale). We created a model of the foot longitudinal arch basing on ANSYS system. The results of measurements in our model revealed that the decrease of the tibial anterior muscle strength was connected with the talonavicular joint subluxation, distension of the ligaments mainly of the plantar calcaneo-navicular ligament and lowering of the foot longitudinal arch.

Krzysztof Kulka, Tomasz Gładysz, Jerzy Walocha, Marek Sajewicz, Tomasz Iskra, Andrzej Skawina

TOPOGRAPHICAL CONSIDERATION OF APPROACH OF ANATOMICAL STRUCTURES RESPONSIBLE FOR PAIN SYNDROMES IN THE LOWER LIMB. INTRAMUSCULAR INJECTIONS OF MUSCULAR ORIGINS AND INSERTIONS IN THE LOWER LIMB

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The main goal of the paper was to present the topography and technique of approach to skeletal muscles origins and insertions in patients suffering from pain syndromes of soft tissues of the lower limb.

We presented the topographic conditions and the technique of approach of tendinous insertions of the lower limb muscles at the typical places of block concerning the anatomical course of the neuro-vascular structures.

Authors pay attention to the safeness of the technique, topographic relations and eventual dangers which may happen by performing such a type of procedure. The paper presents the insertions of muscles in the hip, knee and foot regions. Injections of longlasting glyocorticosteroids into changed by inflammations tendon are usually performed in the everyday practise of rheumatologists and orthopaedics, it is also more and more commonly performed in the practise of general physicians as a medical curable procedure.

Krzysztof Kulka, Janusz Gorczyca, Jarosław Zawiliński, Robert Śródek, Anna Niżnik-Kulka\*, Andrzej Skawina

TOPOGRAPHICAL CONSIDERATION OF APPROACH OF BAKER'S CYST IN THE POPLITEAL REGION IN ORDER TO PRICK

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The main goal of the paper was to present the topography and technique of approach to Baker's cyst in the popliteal region in order to prick.

We presented the topographic conditions and the technique of approach to Baker's cyst in the popliteal region concerning the anatomical course of the neuro-vascular structures.

Authors pay attention to the safeness of the technique, topographic relations and eventual dangers which may happen by performing such a type of procedure. The paper presents the location of bursae in the knee regions and Baker's cyst.

The prick and injection of longlasting glyocorticosteroid are usually performed in the everyday practise of rheumatologists and orthopaedics, it is also more and more commonly performed in the practise of general physicians as a medical curable procedure.

Krzysztof Kulka, Ewa Mizia, Janusz Gorczyca, Andrzej Gryglewski, Anna Niżnik-Kulka\*, Andrzej Skawina

TOPOGRAPHICAL CONSIDERATION OF APPROACH OF ANATOMICAL STRUCTURES RESPONSIBLE FOR PAIN SYNDROMES IN THE LOWER LIMB. INJECTIONS INTO BURSAE OF THE LOWER LIMB

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The main goal of the paper was to present the topography and technique of approach to bursae in patients suffering from pain syndromes of soft tissues of the lower limb.

We presented the topographic conditions and the technique of approach to bursae of the lower limb at the typical places of block concerning the anatomical course of the neuro-vascular structures.

Authors pay attention to the safeness of the technique, topographic relations and eventual dangers which may happen by performing such a type of procedure. The paper presents the location of bursae in the hip, knee and foot regions. Injections of longlasting glyocorticosteroids into changed by inflammations bursae are usually performed in the everyday practise of rheumatologists and orthopaedics, it is also more and more commonly performed in the practise of general physicians as a medical curable procedure.

Krzysztof Kulka, Ewa Mizia, Robert Śródek, Andrzej Gryglewski, Anna Niżnik-Kulka\*, Andrzej Skawina

TOPOGRAPHICAL CONSIDERATION OF APPROACH OF ANATOMICAL STRUCTURES RESPONSIBLE FOR PAIN SYNDROMES IN THE UPPER LIMB. INJECTIONS INTO BURSAE OF THE UPPER LIMB

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The main goal of the paper was to present the topography and technique of approach to bursae in patients suffering from pain syndromes of soft tissues of the upper limb.

We presented the topographic conditions and the technique of approach of bursae of the upper limb at the typical places of block concerning the anatomical course of the neuro-vascular structures.

Authors pay attention to the safeness of the technique, topographic relations and eventual dangers which may happen by performing such a type of procedure. The paper presents the location of bursae in the shoulder, elbow and hand regions. Injections of longlasting glyocorticosteroids into changed by inflammations bursae are usually performed in the everyday practise of rheumatologists and orthopaedics, it is also more and more commonly performed in the practise of general physicians as a medical curable procedure.

Krzysztof Kulka, Ewa Mizia, Robert Środek, Andrzej Gryglewski, Andrzej Skawina, Anna Niznik-Kulka\*

TOPOGRAPHICAL CONSIDERATION OF APPROACH OF ANATOMICAL STRUCTURES RESPONSIBLE FOR PAIN SYNDROMES IN THE UPPER LIMB. INTRAMUSCULAR INJECTIONS OF MUSCULAR ORIGINS AND INSERTIONS IN THE UPPER LIMB

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The main goal of the paper was to present the topography and technique of approach to skeletal muscles origins and insertions in patients suffering from pain syndromes of soft tissues of the upper limb.

We presented the topographic conditions and the technique of approach of tendinous insertions of the upper limb muscles at the typical places of block concerning the anatomical course of the neuro-vascular structures.

Authors pay attention to the safety of the technique, topographic relations and eventual dangers which may happen by performing such a type of procedure. The paper presents the insertions of muscles: supraspinatus, biceps brachii, hand's flexors and extensors into medial and lateral epicondyles of humerus. Injections of longlasting glycocorticosteroids into changed by inflammations tendon are usually performed in the everyday practise of rheumatologists and orthopaedics, it is also more and more commonly performed in the practise of general physicians as a medical curable procedure.

Krzysztof Kulka, Wiesława Klimek-Piotrowska, Tomasz Iskra, Tomasz Gładysz, Tomasz Bereza, Andrzej Skawina

TOPOGRAPHICAL CONSIDERATION OF APPROACH OF ANATOMICAL STRUCTURES RESPONSIBLE FOR PAIN SYNDROMES IN THE UPPER LIMB. THE ANAESTHETIC INJECTIONS OF NERVES IN SHOULDER'S REGION

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The main goal of the paper was to present the topography and technique of approach to nerves of shoulder region in patients suffering from pain syndromes of the upper limb.

We presented the topographic conditions and the technique of approach of nerves of shoulder region at the typical places of block concerning the anatomical course of the neuro-vascular structures.

Authors pay attention to the safety of the technique, topographic relations and eventual dangers which may happen by performing such a type of procedure. The paper presents the technique of approach to suprascapular nerve. Injections of anaesthetic agents and glycocorticosteroids into region of this nerve usually performed in the everyday practise of neurologists, rheumatologists and anaesthesiologists.

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THE PRESENTATION OF THE WEBSITE OF MEDICAL COLLEGE AND ITS MUSEUM OF JAGIELLONIAN UNIVERSITY OF KRAKÓW

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3.Surgical ward of SPZOZ Rabka

The website present the whole of scientific output, history and anatomical teaching in Kraków since most old time. There are most interesting achievement of Krakow's anatomists and them contribution in the development of polish anatomy.

Authors pay attention to the unique museum of anatomy Medical College of Jagiellonian University of Kraków. The educational aspect are very useful for medical students. The paper presents the materials of history, philosophy, painting, drawing and sculpture made by the famous personality of Krakovian scientists.

Jacek Kunicki<sup>1</sup>, Paweł Krajewski<sup>2</sup>, Małgorzata Brzozowska<sup>2</sup>, Bogdan Ciszek<sup>1</sup>

MICROSURGICAL RELATIONSHIPS BETWEEN THE VEINS OF THE POSTERIOR CRANIAL FOSSA AND THE TRIGEMINAL NERVE

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Vascular compression of the trigeminal nerve root has been considered as a main factor responsible for trigeminal neuralgia. The arterial compression of the trigeminal nerve is reported as the main cause of trigeminal neuralgia but there is a number of studies that confirm the possibility of trigeminal neuralgia caused by veins. Moreover venous compression of trigeminal nerve is a significant factor for recurrence after initial microvascular decompression. The purpose of this study is to establish the relationships of the venous vessels with the trigeminal nerve root in facial pain free population.

A hundred trigeminal nerves of 50 fresh cadavers were examined. The veins of the posterior cranial fossa were perfused with colored latex in a retrograde direction to facilitate the dissection.

The superior petrosal vein (SPV) complex was the main cause of a nerve-venous contact. In 69% of examined specimens the trigeminal nerve was in contact with a vein, the typical compression with deformity of the trigeminal nerve root was observed in 9% of cases. The most often offending veins were the transverse pontine vein and the lateral mesencephalic vein. In four cases the trigeminal nerve was traversed by the tributary of the superior petrosal vein. Our findings show that contact between the cisternal segment of the trigeminal nerve and the SPV tributaries is common finding in pain free population.

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#### THE ANATOMY OF VERTEBRAL ARTERIES (VA) AND VERTEBROBASILAR JUNCTION (VBJ) IN HUMAN ADULTS AND FETAL BRAINSTEMS — THE COMPARATIVE STUDY

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The shape of vertebral arteries (VA) is early determined in fetal life but it's not decisive.

The aim of this study was to compare the shape and course of vertebral arteries and vertebrobasilar junction (VBJ) in fetal and adult brainstems.

The examination was performed on 50 adult and 30 fetal brainstems (12–32 hbd). The vertebrobasilar system was injected with colored latex. All specimens were fixed in 10% formaldehyde solution for two months. Dissection was carried out with the microsurgical instruments and microscope with magnification 4x40. Measurements were taken with use of MultiScanBase v. 8.08. The outer diameters of both vertebral arteries and the angle between these vessels were also measured.

The different diameters of right and left VA in fetus and in adults were documented. The ectatic changes were also observed. These anomalies may lead to displacement and tortuosity of basilar artery (BA). When proportionally similar differences in vessel diameters and angles occur in fetus and in adults the variation in flow rates will be greater in adults and correspondingly greater increase of BA displacement will result.

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#### THE ANATOMY OF THE BASILAR ARTERY (BA) IN HUMAN ADULT AND FETAL BRAINSTEMS — THE COMPARATIVE STUDY

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The basilar artery (BA) is the single vascular trunk running along the midline of the pons. The straight course of BA along the basilar sulcus is not always observed.

The aim of study was to determine the cause of the tortuous appearances of BA, its pontine branches and pontine part of cerebellar arteries in human adults and in fetuses.

The BA and its branches were examined in 100 brainstems of adults (male and female) and 30 fetal brainstems (12–30 hbd). The vertebrobasilar system was injected with colored latex. All specimens were fixed in 10% formaldehyde solution for two months. Dissection was carried out with the microsurgical instruments and microscope with magnification 4 x 40. Measurements were taken with use of MultiScanBase v. 8.08.

Two main factors seem to determine the course of the basilar artery: the amount of blood streaming through the VA assessed by measuring diameters of these vessels in their terminal sectors just before their union to form BA, the direction of the blood stream through the terminal parts of the VA, determined by measuring the angle between the midline of each vessel.

The investigation in the fetus indicates that the shape of BA may be established early. The tortuosity of BA may cause specific mechanisms such as distortion of pontine branches and hemodynamic factors that may contribute to ischemia.

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#### THE CLINICAL ANATOMY OF DOG'S AND CAT'S LIVERS

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**Introduction.** The purpose of the work was to describe the topography of the organ, the possibilities of examining it and to show the correct X-ray and ultrasound picture of the liver. **Material and methods.** A standard dissection was carried out on corpses of 20 dogs and 20 cats of various breeds. A clinical examination of the liver was performed on 100 dogs and 100 cats in which no symptoms of systemic diseases or diseases of alimentary system were observed. X-ray examinations were taken with Multax 320 in standard projections: profile and sagittal. The photographs on Agfa films and tapes were developed in Curix automatic darkroom. For ultrasound tests the Echoson EXD with sectors heads of 3,5 and 5 MHz frequency was used.

**Results.** During the dissection the localization of the lobes of dog's and cat's liver was characterized. It was noticed that the ventral edge of the liver in cats, little dogs and shallow-chested dogs stuck out beyond parasternal part of the costal arch. Skeletotopia and syntopia of the gland and the access to the gallbladder were described. Hepatic dullness field was determined. In the clinical examination the symmetry of the abdominal cavity description was assessed by looking at the animal from behind, from above and from both sides. The evaluation of the color of the non-pigmented skin, mucous membrane and the smell of the exhaled air is also necessary. The peristalsis of the intestines was assessed by auscultation. Hypertonia can be a result of a severe hepatitis. Among dogs the palpation of the liver is difficult, even where the organ is not covered with ribs. The obstacles are the presence of the rectus abdominis and the fat tissue under parietal peritoneum. Among cats which are not obese partial palpation of the organ is possible. We reach: the left, the ventral, the right edge and a small part of diaphragm and visceral surface of the liver. In X-ray picture the size and the shape of the liver's shadow were assessed. This picture does not show the lobes of the liver, the gallbladder and the bile ducts. The size of the liver was assessed based on the position of the posterior outline of the liver's shadow and regular shape its margin line. In ultrasound picture echogenicity of the liver's flesh, the spleen, the right kidney and the echostructure of the gallbladder were determined. In physiological states the bile ducts are not seen. However the venous structure of the liver was observed. In ultrasound picture the whole liver is rarely seen, so the assessment of its size is more accurate in the X-ray picture.

**Conclusions.** 1. Physical examination of the liver in dogs and cats should be the first step in a clinical evaluation of the organ. 2. Because of difficulties in the physical evaluation, ultrasound and radiological imaging of the organ should be considered as essential additional examinations. 3. Ultrasonography and radiology should be considered mutually complementary examinations.

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#### CLINICAL AND INSTRUMENTAL METHODS OF THE DIAGNOSTICS OF THE FOOT PATHOLOGY

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Human foot is complicated anatomical structure. Its pathology is important problem in treatment of the locomotory apparatus of the children and adults. Lack of adequate anatomical knowledge, bad clinical evaluation are source of many mistakes in medical practice.

On the base of plathypodia pathology authors present current status of the clinical evaluation of the foot.

Clinical investigation of the foot is composed of evaluation of pain of foot and calf, evaluation of the skin, deformation of shoes and functional tests.

Plantography and anthropometry by number of objective indexes are source of information about foot structure in different functional states. On X-rays in two projections number of angles reflects level of orthopedic pathology.

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#### BONE MARROW FIBROSIS IN PATIENTS WITH HODGKIN'S DISEASE

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**Background:** Bone marrow examination by trephine biopsy (TB) makes possibility for evaluation of reticulin fibrosis (an increasing number of silver fibres) and collagen fibrosis (an increasing number of collagen fibres). TB is routinely used in the cases of diagnosis of many hematological disorders. One of them is Hodgkin's disease (HD), a systemic neoplastic disease of lymphoproliferative system. The recognition of HD requires histopathological evaluation of involved organ more often, however, the lymph node. Marrow involvement in the course of HD is less frequent than in non-Hodgkin's lymphoma. TB is a part of the Ann Arbor clinical staging criteria.

**The aim of the study** was to determine degree of bone marrow fibrosis in various histological subtypes of HD.

**Material and methods:** Trephine biopsies of bone marrow were taken, as initial examinations prior to any treatment, from the postero-superior iliac crest using the Jamshidi needle from 30 patients (9 female and 21 male, aged 9 to 64 years). Bone marrow tissue, immediately after collection, was fixed in Oxford solution and subsequently underwent routine histological procedure. Hematoxylin and eosin, Gomori, AZAN staining was applied. The degree of bone marrow fibrosis using Kundel criteria with Bauermeister modification was determined.

**Results:** We found the mild degree (I°) of fibrosis in bone marrow in all histological subtypes of HD. Collagen fibrosis wasn't found in all cases. In individual cases of nodular sclerosis type I (NSI) and type II (NSII) as well as mixed type (MC) we observed a more marked increase in reticulin fibrosis (II°) in patients with advanced clinically cases (III B). In one case of HD we noted a greater degree of reticulin fibrosis (III°) in patient with NSII and IV degree of clinical stage. All patients with reticulin fibrosis, grade II and III, were older than 30.

**Conclusion:** The frequency of reticulin fibrosis was positively correlated with advanced clinical stage and age. It may be suggested that other factors might influence increase in number of silver fibres.

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#### FOOT FUNCTIONAL ANATOMY AFTER CALCANEAL BONE FRACTURE TREATMENT

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It has been estimated calcaneal bone fracture in about 60% of the tarsal bone fractures. The aim of this study was to evaluate changes of foot functional anatomy during rehabilitative treatment after calcaneal bone fracture. To our study we included 5 patients rehabilitative treated between 3<sup>rd</sup> and 6<sup>th</sup> month after calcaneal bone fracture (fractures with normal Bohler's angle I type according to Essex-Lopresti). The control group consisted of 40 healthy persons. In all patients physical examination, X-ray tests and pedobarographic study before starting and after finishing of the treatment were made. For underfoot pressure analysis we used Blomgren's classification. Physical examination revealed regression of the tarsal edema and the increase of movement range of foot joints. X-ray revealed progressive bone knit. Pedobarographic examination revealed in 6<sup>th</sup> month after injury persisted decrease of maximal pressure and decrease of foot contact area with base on the side with calcaneal bone fracture, and gradual decrease of the MT4, MT5 and T foot region overload on the side opposite to that with fracture. Conclusion: Pedobarographic examination is helpful during monitoring of the rehabilitative treatment of the foot after calcaneal bone fracture. This examination reveals changes of underfoot pressure distribution in the 6<sup>th</sup> month after the foot injury.

Jacek Lewandowski, Paweł Szulc

#### ELECTROGONIOMETRIC PRESENTATION OF THORACIC KYPHOSIS IN CHILDREN AGED 3-6

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High reliability and accuracy of electrogoniometric measurement compared to radiological evaluation allows to use tensiometric electrogoniometry both in the diagnostic process and in the screening analyses of body posture defects and spine kyphosis [1]. The results of so far published studies reveal lack of consent with regard to the degree of normal spine curvatures thus making it impossible to work out relevant norms for population studies. Therefore the goal of this study has been to determine the desired angular values of the thoracic kyphosis depending on the age and sex of the individual and find out the degree of correlation between thoracic kyphosis and somatic features of the studied populations.

Electrogoniometric measurements of thoracic kyphosis have been carried out with Penny & Giles electrogoniometre in 240 children (120 girls and 120 boys) aged 3-6 years based on the methodology worked out by the authors [2]. The following somatic measurements have also been carried out: body weight and height, length of thoracic spine and transverse and sagittal dimensions of the chest. The obtained results were submitted for statistical analysis.

The mean values of thoracic kyphosis in the relevant age groups were as follows: 3 years: girls 16.2° ± 6.4°; boys 15.5° ± 5.1°; 4 years: girls 22.0° ± 6.1°; boys 23.3° ± 6.8°; 5 years: girls 23.7° ± 6.2°; boys 24.1° ± 6.8°; 6 years: girls 24.3° ± 6.2°; boys 23.7° ± 6.6°. The degree of kyphosis increased with the age of the analysed populations, the rise being most intensive between years 3 and 4, and was comparable with the results of radiological measurements [3, 4]. The analysis did not reveal any significant correlation between the degree of the kyphosis of the thoracic spine and the somatic measurements, however the correlation factors increased with the age of the studied populations.

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#### FUNCTIONAL ANATOMY OF KNEE JOINT IN HEMOPHILIA — CASE REPORT

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The patient B.P 20 y old treated because of hemophilia was submitted to our Centre because of flexion contracture (20°) of the right knee joint. The maximal active and passive flexion of the knee joint was 70°. The increased circumference of the knee joint (for 1 cm comparing with left side), atrophy of thigh muscles mainly of the quadriceps femoris muscle (the thigh circumference was decreased by 7 cm comparing with the left side) and atrophy of the leg muscles (the leg circumference was decreased by 3 cm comparing with the left side) was found. The strength of thigh muscles estimated using Lovett's classification was 3. X-ray tests revealed advanced degenerative changes of the right knee joint. Pedobarographic examination revealed a decreased pressure under T and H foot region of the right lower limb (the difference in H foot region between both lower limbs was 113 g/cm<sup>2</sup>). The rehabilitation was used and there was observed total regression of contracture, the increase of thigh and leg circumference, the increase of muscle strength (4,5 in Lovett's scale). Pedobarographic examination performed during treatment revealed gradual decrease of differences between pressure under right and left foot. Conclusion: Pedobarographic examination seems to be the sensitive tool for monitoring of rehabilitation progress and biomechanical changes of the lower limb during rehabilitative treatment of secondary degenerative knee joint changes in case of hemophilia.

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#### UNDERFOOT PRESSURE DISTRIBUTION IN PATIENTS WITH LOWER LIMB LENGTH INEQUALITY

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The lower limb length inequality causes changes of biomechanics of the movement system. The goal of this study was to estimate the underfoot pressure distribution of patients with considerable lower limb length inequality. We examined 10 patients, both sexes, aged 43–62 with the lower limb length inequality over 5 cm and 20 healthy volunteers both sexes as the control group. In all persons we performed physical, radiological and pedobarographic examinations. We used Blomgren's classification for underfoot pressure distribution analysis. On the base of pedobarographic tests in 3 persons we stated that on the side with the longer lower extremity the maximal underfoot pressure was located in the T foot region, less pressure was in the H foot region and on the side with shorter lower limb maximal underfoot pressure was located in the MT3 foot region and we found the lack of the foot contact area with the base in the H and T foot regions. In 7 patients the pedobarography revealed on the side with the longer lower limb the maximal underfoot pressure in the H foot region and on the opposite side lack of foot contact area with base in T and H foot regions and maximal pressure in MT3 foot region. Conclusion: In the case of the lower limb length inequality pedobarographic examination shows lack of the foot contact area with the base in the T and H foot regions of the shorter lower limb and overloaded T and H foot regions of the longer lower limb.

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#### FOOT FUNCTIONAL ANATOMY BEFORE AND AFTER KELLER'S OPERATION OF HALLUX VALGUS

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Hallux valgus is the one of most frequent foot deformation. The aim of our study was to analyze the foot functional anatomy changes before and after Keller's operation of hallux valgus deformity. We included to our study 7 patients, both sexes, aged 52–68y operated because of hallux valgus presence (14 feet, maximal hallux valgus angle 45°). Control group consisted of 40 persons, both sexes without any musculoskeletal system deformities and systemic diseases. In all patients we performed physical, radiological and pedobarographic examinations before and after surgical treatment. For underfoot pressure distribution analysis we divided the foot plantar side into areas according to Blomgren's classification. After surgery physical and radiological examinations showed reconstruction of the correct hallux metatarsophalangeal angle. On pedobarographic examination we did not find any statistically significant differences of underfoot pressure distribution in all plantar regions of foot with hallux valgus deformity before and after surgery. Conclusion: The correction of the forefoot anatomical relations by Keller's operation does not induce statistically significant underfoot pressure changes.

D. Łoś, J. Dijkiewicz, P. Bielicki

#### CLINICAL USEFULNESS OF THE ASSESMENT OF LOWER THIRD MOLAR'S ROOTS POSITIONS

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The aim of the study was to estimate the clinical usefulness in pantomographic radiographs of inferior wisdom teeth surgical removal. The research evaluated relation of the position of the roots due to inferior alveolar nerve and the possibility of postsurgical complications such as paraesthesia. That is why two hundred case histories of this surgical procedure were retrospectively analysed. According to the research the usefulness of pantomographic films was proven considering the location, angle of the tooth axis, level of retention and relation to mandibular canal.

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#### INTRACRANIAL ARTERIAL MALFORMATIONS AS THE CAUSE OF CHRONIC DISTURBANCES OF EQUILIBRIUM

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The ventral portion of the pons is supplied by three groups of arteries derived from the basilar artery, and these branches are grouped as paramedian, short circumferential and long circumferential. Classic description of the symptoms of the sudden occlusion of paramedian branches of the basilar artery on one side indicates, that as a result of lesion in the basilar part of the pons contralateral hemiparesis and damage to the root fibers of the ipsilateral abducens nerve are present. Middle alternating hemiplegia is a classic example of such a lesion. Obstruction of the short circumferential arteries on one side usually results in ipsilateral cerebellar and autonomic disturbances and impairment of contralateral sensation. Occlusion of the long circumferential arteries produces cranial nerve disturbances, paresis of conjugate eye movements, contralateral hemianesthesia, ipsilateral cerebellar disturbances, and frequently nystagmus. Disturbances of equilibrium usually are transient. Own observation: Young female (16 years — case history 5790/00) admitted to Laryngology Department on June 2000 complaining of sudden dizziness, without loss of equilibrium. The neurological and ophthalmological examination of the fundus of the eye proved normal. From May to November 2001 hospitalized three times as the cause of permanent disturbances of equilibrium, dysarthria, paresis of conjugate eye movements and nystagmus. Episodes were not longer than 24 hours and retrograde amnesia was also present. The RMI test showed the presence of the congenital intussusception of the base of the posterior cranial fossa of the skull and hypoplasia of the basilar artery. Then the patient was admitted to therapy in Neurology Department in Medical University of Lublin. Above presented case indicate that an understanding of the complexity and diversity of the intracranial vascular malformations and their configurations is necessary to avoid diagnostic problems and should simplify the decision about treatment.

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ANALYSIS OF FUNCTIONALLY BASED MORPHOLOGY  
DISORDERS OF STOMATOGNATHIC SYSTEM

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In the investigation of etiopathogenesis of the stomatognathic system disorders not much attention has been given to functional factors. Role of the tongue dyskinesia and oral breathing is especially missing.

The aim of the work was the analysis of functionally based morphological disorders of the stomatognathic system.

During the investigation 860 children, age of 3 to 14 years, has been checked. Patients have been previously directed for correction of the occlusion and pronunciation disorders. Clinical procedures have been accompanied by filling up an oral breathing questionnaire.

As the result of the investigation in the group of children with the tongue dyskinesia (n = 850), occlusion disorders anterior and posterior in the frontal plane have been detected and vertical disorders in the Frankfurt plane. In the group with oral breathing (n = 660) beyond described disorders, restriction in the maxilla growth, transversal abnormalities in the sagittal plane have been noticed. Amongst the children with both oral breathing and tongue dyskinesia, jointed morphological abnormalities of the stomatognathic system and facial skull.

The analysis of functionally based morphological disorders of stomatognathic system has shown a significant role of the tongue dyskinesia and oral breathing. Described dysfunctions should be treated as basic factors in the etiopathogenesis.

Barbara Mierzejewska-Krzyżowska, Leszek Zguczyński, Dorota Bukowska#

QUANTITATIVE COMPARISON OF THE SENSORY NEURONS  
PROVIDING AXON COLLATERALS IN TRIGEMINOCEREBELLAR  
PATHWAYS OF THE RABBIT

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It is known that some cerebellar afferent fibers may send collaterals to terminate in various parts of the cerebellum. In the present study we examined divergent projections of trigemino-cerebellar sensory neurons to the paramedian lobule (PML) with using the retrograde tracing technique with fluorescent tracers. Two sets of experiments were performed. In one group of rabbits injections of 5% Fast blue (FB) and 2% Diamidino yellow (DY) were made into the left and right PML respectively, and in the second group, the same injections were made into the unilateral rostral (rPML) and caudal (cPML) parts of PML, respectively. In both groups a great number of single FB or DY, and relative small number of double FB+DY labeled neurons were identified in the principal trigeminal (Vp) and spinal trigeminal nuclei including subnucleus oralis (Vo), and rostral (Vir) and caudal (Vic) subnucleus interpolaris. Quantitative analysis showed that out of the total population of single labeled neurons in Vp, Vo, Vir, Vic and, double ones constituted in these nuclei: 0.5–3.9% (average 2.1%), 0.0–19.3% (average 11.1%), 0.3–3.7% (average 2.1%) and 0.0–4.3% (average 1.3%) respectively, after injections into PML of both sides, and 0.0–4.4% (average 2.5%), 1.0–5.0% (average 2.4%), 2.8–3.8% (average 2.6%) and 2.2–7.3% (average 4.1%) respectively, following unilateral injections into rPML and cPML. The present findings indicate that the main collateralized projection to PML of both sides originates in Vo, and that the unilateral rPML and cPML are targets mainly for projection from Vic. Other trigeminal nuclei under study project at similar proportion, but less frequently. It is concluded that neurons of trigeminal sensory complex, by way of axon collaterals, may form both interlobular as well as intralobular connections within cerebellar PML.

Key words: Trigemino-cerebellar collateral projection. Fluorescent double labeling. Rabbit

Barbara Mierzejewska-Krzyżowska, Leszek Zguczyński, Dorota Bukowska#

ANALYSIS OF THE INTER- AND INTRALOBULAR  
PONTOCEREBELLAR PROJECTIONS TO THE RABBIT  
PARAMEDIAN LOBULE BY MEANS OF AXON COLLATERALS

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Cerebral information destined for the cerebellum is relayed by several pontocerebellar nuclei in the brainstem, the most prominent of which are the pontine nuclei (PN). Pontine fibers reach most regions of the cerebellar cortex, but also send collaterals to the cerebellar nuclei and to the both hemispheres in the rat and cat. The present study in the rabbit shows that PN neurons projecting to the cerebellar paramedian lobule (PML) may give off axon collaterals to the PML of both sides as well as to the rostral (rPML, forelimb area) and caudal (cPML, hindlimb area) PML regions. The method of fluorescent double labeling with Fast blue (FB) and Diamidino yellow (DY) was employed herein. Combinations of tracer injections were made to the various sublobules of the left (FB) and right (DY) PML as well as to the unilateral rPML (FB) and cPML (DY). In both groups a great number of single FB or DY, and a small number of double FB+DY labeled PN neurons were recognized in determined regions of bilateral PN, i.e. the dorsolateral (DL), paramedian (PM), peduncular (PD) and the lateral nuclei (L). Quantitative comparison of double labeled neurons indicates that: PN neurons may send axon collaterals to PML of both sides, and even more numerous, to rPML and cPML. Projections to PML of both sides originate mainly from DL and PD, but DL and PM are main sources of connections to rPML and cPML. In the present study the existence of inter- and intralobular axonal branching of PN neurons implies that functionally different PML regions are linked. Thus, the findings suggest that some PN neurons may exert simultaneously modulatory influences on different regions of PML of both hemispheres and, to larger extent, they may be engaged in coordination of contralateral and ipsilateral forelimb and hindlimb movements.

Key words: Pontocerebellar collateral projection. Fluorescent double labeling. Rabbit

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THE TOPOGRAPHY OF THE VASCULAR AND NEURAL  
ANATOMICAL STRUCTURES OF THE UPPER LIMB AND THE  
SHOULDER GIRDLE IN THE MOST COMMON SURGICAL  
PROCEDURES IN EMERGENCY AND ORTHOPEDIC SURGERY.  
PART I

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This article was intended to present the analysis of topographic relations (proximity and course) of basic anatomical, neural and vascular structures of the upper limb and the shoulder girdle as well as their range of vascularization and innervation. The surgical and diagnostic procedures regarding the course of the above mentioned structures were presented. The authors also considered iatrogenic complications which may result from the presented surgical interventions.

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THE TOPOGRAPHY OF THE VASCULAR AND NEURAL ANATOMICAL STRUCTURES OF THE LOWER LIMB AND THE PELVIC GIRDLE IN THE MOST COMMON SURGICAL PROCEDURES IN EMERGENCY AND ORTHOPEDIC SURGERY. PART II

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The authors intended to analyze the topographic relations (proximity and course) of basic anatomical, neural and vascular structures of the lower limb and the pelvic girdle as well as their range of vascularization. The surgical and diagnostic procedures regarding the course of the above mentioned anatomical structures were presented. The authors also considered the iatrogenic complications which may result from the presented surgical interventions.

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ANATOMICAL FEATURES OF VASCULAR ACCESS IN ADULTS AND CHILDREN FROM THE CLINICAL ASPECT

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Anatomical features of vascular accesses obtained by surgical procedures performed in Department of General Surgery and Pediatric Surgery Clinic were presented. The convenient vascular access in: adults and children when immediate transfusion of the greater quantities of fluids is required, when a vascular bed is not enough filled, for central venous pressure measurement, in patients receiving parenteral nutrition, chemotherapy and dialyses, can be obtained through: internal jugular vein, subclavian vein, external jugular vein and femoral vein. Temporary vascular access was obtained by Seldinger's technique, by incision in local anesthesia as well as by open technique under sight control in general combined anesthesia. The surgical procedures during which the vessels are uncovered allow to avoid common complications resulting from vessels puncture (mainly the cervical vessels) and obtain vascular access which enables patients immediate start of infusion and the prolonged use of catheters without pain symptoms. In adults, vascular access is obtained mostly through internal jugular vein and subclavian vein, whereas in children internal and external jugular vein and femoral vein are used. In this article anatomical features of the access into particular vessels are described in detail (the vessel topography, the incision site, the technique of catheter insertion) with regard to the individual variation of the anatomy and topography of the vessels.

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MAGNETIC RESONANCE VOLUMETRIC STUDY OF THE TEMPORAL LOBE STRUCTURES IN DEPRESSION

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In the recent years, structural imaging technology has provided an opportunity to examine the brain anatomy in patients with psychiatric illness. An understanding of brain structural abnormalities in psychiatric disorders is very important due to proper care and treatment for these common syndromes. Depression is a common psychiatric disorder that is associated with considerable morbidity.

10 patients aged from 22 to 63 years (mean — 39,8 y.) and — as the control group — 16 healthy subjects aged from 23 to 59 years (mean — 39,3 y.) were examined using MRI method of neuroimaging. It was performed on a 0,5T superconducting scanner (Gyrosan T5 Philips, Best Netherland) using a standard head coil. The coronal T1/3D/FFE sequence perpendicular to the long hippocampal axis of the temporal lobe was performed. The slices' thickness was 1 mm with no gap. The volume of following structures were evaluated in the right and left hemisphere: superior temporal gyrus (STG), basolateral temporal area (the region including middle temporal gyrus, inferior temporal gyrus and fusiform gyrus), parahippocampal gyrus, hippocampal head, amygdaloid body and the lateral ventricle. The ANOVA test was used for the evaluation of the differences of the volume of studied structures between control and examined group, as well as between the right and left hemisphere. The significant difference between the control group and the group with depression concerned only the volume of the temporal horn of the lateral ventricle of both hemispheres. The left temporal horn was 49,8%, whereas the right — 38,4% larger in depressed patients in comparison with the control group. Control group characterized significant differences in the volume of all studied structures between the left and right hemispheres, whereas in the group with depression the only significant difference of the volume between hemispheres concerned the amygdaloid body.

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IMAGING OF ORBITAL LESIONS

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Radiological patterns of orbits were presented in various diseases associated with translocation of normal anatomical structures, most frequently eye ball and its muscles. The studies were documented by screening radiograms of facial skull, made in PA projection and aimed at lateral nasal sinuses and the orbit, by computerized tomography of the region and magnetic resonance patterns. Cases of patients were presented, treated in the Department of Maxillofacial Surgery, University Medical School, Poznań. One of the groups included patients with fractures of the zygomatic-maxillary-orbital mass. The trauma resulted in formation of hematoma and transplaced osseous walls of the maxilla, zygomatic bone and of other bones which formed the orbit. This resulted in transplacement of the eye ball, diplopia, restricted motility (due to entrapment of the muscles in the fracture fissure and paresthesiae within the range of I or II branch of the trigeminal nerve due to disruption or entrapment of the nerve between the fragments. A separate group consisted of patients with the isolated fracture of the orbital bottom, the so called blow out fracture, which resulted from a trauma with a dull object, e.g. tennis ball, acting directly on the eyeball. This resulted in an altered horizontal dimension of the eyeball, in an increased intraorbital pressure and in the fracture of the thinnest, the lower orbital wall, which included the canal of suborbital nerve, with protruding of some orbital tissues into the maxillary sinus. In such cases the radiological pattern demonstrated a semicircular shadow below the roof of the sinus, the so called sign of a falling drop. The second group included patients with orbit deformations in the course of tumors which penetrated the surrounding structures. As a rule, the tumors involved squamocellular carcinomas of various maturity, developing from epithelial tissue which covered ethmoid lamina, lateral nasal sinuses and nasal cavity. Most frequently, this was accompanied by transplacement of the eyeball, infiltration of nerves and muscles with the resulting disturbed vision and disturbed motility of the eyeball. Clinically, this was manifested by occlusion of the nose, lacrimation, strabismus, sensory disturbances with very intense pain radiating to the posterior wall of the pharynx, to the temporal and frontal regions.

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#### THE CONDUCTIVE SYSTEM IN THE RIGHT VENTRICLE OF HUMAN HEART

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The conductive system of the heart consists of two nodes: sinus (superior generator of heart systoles) and atrio-ventricular node. The conductive pathways — Hiss bundle with its left and right branches, finally creating Purkinji fibres — are the continuum of the second node mentioned above.

The main role of that system is generating and conducting impulses toward heart muscle fibres, which results in systole. Significant differences in the morphology and run of the Hiss bundle branches do exist.

The purpose of the study was the detail estimation of the topography of the right bundle branch and its relation to the septo-marginal trabecula (SMT) and anterior papillary muscle. The material consisted of 30 human hearts (10 fetuses, 10 children, and 10 adults). The slides were cut in the frontal plane of the interventricular septum (IVS) and stained with Masson-Goldner method. It allowed visualising and following the run of conductive pathways from atrio-ventricular node, through Hiss bundle and its right branch in the proximal and distal segment. In all of the examined cases it was observed, that the solid right branch, oval in cross-section, running subendocardially in the IVS is the continuation of Hiss bundle. Then it infiltrates the IVS deeper, gradually giving some fibres to it. Running close to the septal papillary muscles it bends downwards, infiltrates the SMT running superficially, beneath the endocardium. It was visibly surrounded by fibrous tissue on its whole length. Some of the fibres reached the basis of anterior papillary muscle, which in the opinion of the clinicians is highly significant for propagation of the depolarisation wave.

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#### CLINICAL ANATOMY OF THE VESSELS RESPONSIBLE FOR TYPE 2 ENDOLEAK PHENOMENON AFTER ENDOVASCULAR TREATMENT OF ABDOMINAL AORTIC ANEURYSM

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„Endoleak” phenomenon is a one of the most frequent complications (8–15%) after endovascular treatment of abdominal aortic aneurysm. Among four distinguished types of endoleak, the second one is directly related to reversed blood flow in lumbar (LA) and inferior mesenteric (IMA) arteries. Knowledge of anatomy of these vessels and in particular their points of origin from abdominal aorta (AA) is crucial for their endoluminal embolization.

The study was performed on 50 unfixed human cadavers (25 male, 25 female), mean age — 43.5. After ligation of common iliac arteries and perfusion of the abdominal aorta with physiological saline, radiopaque contrast medium (solution of barium sulfur) was introduced and x-ray taken in three standard projections. Thereafter, dissection of abdominal aorta and initial parts of LA and IMA was carried out. *In situ* measurements were performed with standard caliper in relation to predetermined topographic points. In final stage, pictures were taken in standard projections with the aid of digital camera. Results of performed measurements on radiograms, *in situ* and in computer system of image analysis were compared and statistically verified.

Lumbar arteries arose from abdominal aorta most frequently (85%) as paired branches, common vascular trunks (11%) and solitary branches from left postero-lateral surface of AA (4%). First pair of lumbar arteries was most frequently observed (92%) and arose from AA at the level or above the renal arteries. Fourth pair of LA arose most frequently from the region of AA bifurcation. Least constant was fifth pair of lumbar arteries. On the left side fifth lumbar artery was present in 23% and on the right side in 8% of studied specimens as a branch of common iliac arteries. IMA artery was present in all studied specimens and arose most frequently from left antero-lateral surface of the AA between the third and fourth pair of LA.

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#### ANATOMY AND TOPOGRAPHY OF CORONARY SINUS IN ENDOSCOPIC STUDY

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Coronary sinus (CS) is the main structure of cardiac venous system. It is located at the left posterior portion of the coronary sulcus. Knowledge of the CS anatomy, particularly its internal topography, is very important during various trans-sinoid procedures. In former investigations classic anatomical methods were frequently used. CS was cut along the longer axis to reveal its internal structures. Our study, employing endoscopic technique, is the first attempt of visualization of the untouched CS. Our study was performed on 50 unfixed human hearts (38 males, 12 females; age 20 to 63, mean age 47) collected during routine autopsies. Endoscopes, 4mm in diameter and optics 0° and 70° were inserted into the coronary sinus from the right atrium, what allowed for detailed evaluation of venous ostia and their valves. In conclusion, endoscopic technique, we employed in our study for the first time, is good, feasible and reliable method of visualization of V.v. and other CS's venous ostia. Furthermore, it allows for visualization of these structures in their natural shape and topography. Results of investigations consists Table 1.

Table 1. Results of our study

Vein	Frequency of incidence	Type of the valve		
		Single leaflet	Double leaflet	Absence
Middle cardiac vein	49/50	6/49	41/49	2/49
Posterior vein of left ventricle	47/50	10/47	25/47	12/47
Obliqu vein of left atrium	49/50	14/49	8/49	27/49
Posteriors veins of left atrium	49/50	5/49	42/49	2/49
Great cardiac vein	50/50	18/50	19/50	12/50

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#### TOPOGRAPHY OF THE FACIAL NERVE CANAL IN HUMAN FETUSES AGED BETWEEN 20 AND 38 WEEKS IN COMPUTED TOMOGRAPHIC STUDY

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Computed tomography of the posterior cranial fossa was applied in 8 fetuses aged between 20 and 38 weeks. Study was made in CT Laboratory with Picker CY PO 2000 apparatus. The thickness of layer was 1mm. In fetus at 20 weeks in sections through pyramid of the temporal bone the tympanic cavity, auditory ossicles, semicircular canals, and the cochlea are clearly visible. On the medial aspect of the pyramid the wide internal auditory meatus and the beginning (labyrinthine) portion of the facial nerve canal are seen. The canal presents a narrow fissure between the cochlea and the vestibule. In fetus at 24 weeks the facial canal is larger and its portion between tympanic cavity and semicircular ducts (tympanic portion) is visible. The geniculate fossa, forming transition between two portions of the facial canal, is observed at the level of the lateral semicircular canal. The tympanic portion is 1mm below that canal. Two parts of the facial canal form an angle opened posteriorly. In fetus of 31 weeks the third (mastoid) portion of the facial canal is seen. This portion passes nearly vertically, and is clearly visible in its lower part, medially to the mastoid cells. It opens through the stylomastoid foramen.

In fetus at 38 weeks all three portions of the facial nerve canal are observed. In these fetuses the second portion passes posteriorly and turns inferiorly along the medial wall of the tympanic cavity.

From performed CT study it is evident that the canal of the facial nerve develops in fetuses between 20 and 31 weeks. Its first portion (labyrinthine) between the internal auditory meatus and the cochlea, and vestibule appears during 20<sup>th</sup> week. The geniculate fossa and tympanic portion of the canal develops in 24<sup>th</sup> week, and the mastoid portion is revealed in fetus of 31 weeks. The most difficult to reveal in CT study is the part of the facial canal between the tympanic and mastoid portions due to its arcuate course. This part was observed in fetus aged 38 weeks.

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#### TRANSPACEMENT OF ANATOMICAL STRUCTURES OF THE MAXILLA AND MANDIBULA IN VARIOUS TYPES OF PATHOLOGY

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In the work, screening radiograms of facial skull with osseous lesions were presented, routinely performed during admission of the patient for treatment. The examination was restricted to classical radiograms, which formed grounds for a more detailed diagnosis while a thorough knowledge of radiological anatomy permitted to detect most of lesions and to select subsequent tests. Patients treated in the Department of Maxillofacial Surgery were selected and divided into four clinical groups. The first, most numerous group included traumatic lesions and fractures of maxilla and mandibula. Fracture of the mandible shaft was presented, with a significant transplacement of fragments and severing of the lower alveolar nerve, fracture of condyloid process with subluxation in the temporo-mandibular joint and bone fracture with fractured dental roots, sticking in the bone fragments. All the fractures which passed through the maxillar dentition had to be treated as open fractures since the severed periosteum provided entry of bacterial infection. The second group included patients with chronic intraosseous inflammatory processes of dental origin, resulting in formation of intraosseous cysts and in transplacement of the osseous canal, dental roots and of the floor of maxillary sinus with a decreased size of the latter. Post-radiotherapy radiograms were also presented, demonstrating mandibular osteoradionecrosis with formation of dermal fistulas and of numerous sequesters. The third group included cases of fibrous dysplasia of facial skull bones. Dysplastic foci were presented which were restricted to one bone, e.g., to maxilla and generalized lesions, which involved the entire skull and developed in the course of, e.g., hyperthyroidism or Recklinghausen's disease. The latter group included also oncological patients in whom radiograms presented periosteal reactions typical for osteogenic sarcoma, destruction of the surrounding structures and obliteration of the osseous trabecular pattern.

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#### RADIOLOGICAL ANATOMY OF SUBMANDIBULAR DUCT

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Submandibular duct is placed in a bottom corner of submandibular triangle. Its internal surface lays on the mylohyoid and hyoglossal muscles. It's covered by platysma and fascia cervicalis superficialis from outside. It produces mucoserous secretion deducted by Wharton (submandibular) duct which arises from internal surface of posterior part of the gland, next it bends on posterior edge of mylohyoid muscle and runs forward and up until it reaches the sublingual curunculus. The duct is about 5 cm long.

The aim of our study is to analyze an anatomical parameters of the sublingual duct such as:

- course (narrowings and bend on mylohyoid muscle so called: genu angle), diameter and length, which may play significant role in an etiology and treatment of sialolithiasis. The study was carried out on 30 corpses. By use of syringe and polyethylic catheter, radiopaque medium (Uropoline) was introduced in the submandibular duct. Next X-rays were taken. They were performed in an oblique projection aiming on the submandibular gland. The measurements were possible because of use radiopaque standard probe placed in examined area when taking X-rays. Authors believe that some anatomical conditions, such as narrow genu angle, may have a great influence on the sialolithiasis origin as well as on its treatment.

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#### VASCULARIZATION OF THE DISCOID MENISCUS

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The discoid meniscus is the most common developmental anomaly, appearing in 0,4–17% of cases in the lateral and in 0,3% in the medial side. It may be found bilaterally, with equal frequency in males and females. They cover greater area of the articular surface of the tibial condyles than do normal menisci, which results in folding during movements of the knee joint. It is manifested clinically as so called snapping knee.

Arterial branches to the semilunar menisci arise radially from the "perimeniscal" vascular ring formed mainly by branches of the medial genicular artery and inferior genicular arteries arising from the popliteal artery. The vascular penetration of the menisci reaches their peripheral 10–30% for the medial meniscus and 10–25% for the lateral one. The meniscal horns have more blood vessels than bodies of the menisci.

Study was made on 3 lateral discoid and 1 medial discoid menisci. Menisci were embedded in toto in paraplast and serially sectioned. Sections 10 µm thick were stained with hematoxylin-eosin and according to Mallory method. It was found that in the horns of the discoid menisci numerous blood vessels, passing in different planes, and occupying all the area of horns were present. The anterior horn was more richly supplied. The vessels entered the horns through attachments of the menisci, and penetrated under the meniscal surfaces lying parallel the surfaces. In the distal parts of the horns, at the level of meniscal bodies, vessels reaching the border between the inner one-third of the discoid meniscus were observed. These vessels do not enter the inner part of the meniscus. Numerous vessels are found in the middle layer of menisci and under their surfaces. In bodies of the discoid menisci the vascular penetration reaches peripheral one-third, with more deep penetration of vessels near surfaces of the menisci. Whole inner area of the discoid part of the menisci is devoid of vessels. No differences in vascularization of the medial and lateral discoid menisci were found.

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#### ANATOMY OF THE MANDIBULAR-MALLEOLAR LIGAMENT

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The mandibular-malleolar ligament is not described in the anatomy textbooks but was demonstrated by Pinto and others. This is an embryological remnant of Meckel's cartilage. This ligament was found connecting the neck and the anterior process of the malleus to the medioposterosuperior part of the capsule, the intaarticular disc, and the sphenomandibular ligament. This tiny anatomical interassociation of the joint apparatus and the middle ear is a possible explanation for some of the ear sensations experienced in biting or chewing. The objectives of our study were to determine: (1) the frequency of occurrence and morphology of the mandibular-malleolar ligament, (2) morphology of Pinto's ligament in endoscopic visualization, and (3) whether tension applied to the mandibular-malleolar ligament could cause movement of the malleus. Fourteen human adult temporomandibular joint and tympanic cavity specimens embalmed in formalin or in 5% nitric acid were examined by gross dissection and with the use of the operating microscope. The floor of the middle cranial fossa was removed exposing the ear ossicles, tympanic membrane, intraarticular disc, course of the chorda tympani nerve, anterior malleolar ligament and mandibular-malleolar ligament.

The dissections exposed mandibular-malleolar ligament in eleven specimens. According to the morphology of this structure we distinguished two groups in the examined material. We observed that tension applied to the mandibular-malleolar ligament resulted in movement of the malleus in three specimens. Endoscopic visualization showed a band of tissue in the posterosuperior aspect in the superior joint space of the temporomandibular joint (Pinto's ligament) in four cases.

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#### FOURTH MOLAR TEETH IN RADIOLOGICAL EXAMINATIONS

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Supernumerary teeth occur in both deciduous and permanent dentition, although they are more common in the permanent dentition. Fourth molar is one of such teeth. The aim of the study was presentation of morphology of fourth molars in radiological examinations. The material comprised all panoramic radiograms taken in the Department of Dental and Maxillofacial Radiology of the Medical University of Lublin in the years 1982–2002. In the material there were found 32 fourth molars. The teeth were predominantly unilateral, more frequently occurred in the maxilla than in the mandible and were located distally to the third molar. Some of them were normal in size and shape, but most of the teeth were rudimentary: single-rooted, smaller than normal molars, not possessing all cusps. Almost invariably the teeth were impacted. They usually did not produce clinical manifestations. However, knowledge on morphology of fourth molars is useful in cases when their extraction is indicated due to failure of eruption or malalignment of permanent teeth.

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#### OMPHALOCELE AS CONGENITAL DEFECT OF FRONT ABDOMINAL WALL — DIAGNOSIS AND OPERATING TREATMENT — DESCRIPTION OF CASE

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One of the frequent congenital defects of the anterior aspect of abdominal wall is the umbilical cord hernia, clinically defined as omphalocele. Thanks to dynamic development of visual techniques and improvement of quality in such investigations a possibility of diagnosis of this defect appeared already in prenatal period. Even surgical reconstruction trials before planned end of pregnancy have been performed. In such cases the pregnancy is finished by cesarean section.

In our work the anatomical aspect and base of mentioned defect was analyzed from developmental conditioning through the prenatal diagnostic to operative reconstruction of abdominal coats (according to the methods of classic newborn child surgery).

USG prints and X-ray pictures were used for better illustration of complexity of this defect. Documentation begins from the moment of defect recognition, including pregnancy monitoring and operative treatment of neonate.

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#### MORPHOLOGY OF THIRD MOLARS WITH INCOMPLETELY FORMED APICES ON THE BASIS OF PANORAMIC RADIOGRAMS

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Third molars, especially mandibular ones, are causative factors of many oral pathologies. Lower third molar is the most often retained teeth and the origin of considerable pain. The aim of the study is presentation of morphology of third molars with incompletely formed apices on the basis of panoramic radiograms. The material comprised routine panoramic radiograms taken in the Department of Dental and Maxillofacial Radiology of the Medical University of Lublin in the years 2000–2001. In cases, where third molars with incompletely formed apices were found, there was determined location of the teeth in the alveolar bone. The angle between occlusal plane and tooth axis was measured that allowed determination of angularity of the teeth (vertical, mesioangular, distoangular, horizontal and inverted). Retromolar space width ratio has also been calculated as a prognostic radiographic feature on which an estimation of future eruption of mandibular third molars could be based. In retained teeth the reasons of impaction such as incorrect angularity, insufficient retromolar space, presence of pathological lesions impeding eruption were analysed. Panoramic radiograms proved useful in diagnostics of morphology of third molars with incompletely formed apices.

Marek Sajewicz, Jerzy Walocho, Tomasz Bereza, Tomasz Gładysz, Agata Musiał, Krzysztof Kulka, Andrzej Skawina

#### THE COURSE OF ESSENTIAL ANATOMICAL STRUCTURES IN ASPECT OF MOST COMMONLY EXECUTED INVASIVE PROCEDURES IN GYNECOLOGICAL ANALGESIA — PART I: PUDENDAL BLOCK

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Analysis of topographical relations was the aim of the paper (relations and course) of pudendal nerve as well as range of its innervation. The most important topographical point in examination and execution procedures per vaginam is ischial spine. Technique of realization of pudendal block with special regards of pudendal nerve course in ischial spine region — was described in our work.

Authors turned also attention onto threats resulting from performance of described invasive procedures.

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THE COURSE OF ESSENTIAL ANATOMICAL STRUCTURES IN ASPECT OF MOST COMMONLY EXECUTED INVASIVE PROCEDURES IN GYNECOLOGICAL ANALGESIA — PART II: APPEASEMENT AND REMOVAL OF PERINATAL PAIN (SPINAL AND EPIDURAL ANALGESIA)

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The aim of the paper was description of location and analysis of topographical relations in subarachnoid and epidural space and as well as course of most important nervous structures i.e. spinal cord, abdominal and dorsal roots, spinal nerves in the neighborhood of cisterna terminalis. Furthermore technique of executing healing and analgetic interventions with regard of the course of mentioned structures were showed.

Authors turned attention onto iatrogenic threats resulting from performance of described analgetic techniques.

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MICROSURGICAL ANATOMY OF THE ARTERIES SUPPLYING THE CHOROID PLEXUS IN THE FOURTH VENTRICLE AND THE REGION OF FORAMINA OF LUSCHKA

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The arteries supplying the choroid plexus of the posterior cranial fossa are difficult to approach because of their location deep within the fourth ventricle and cerebellopontine angles. They originate from multiple sites on the cerebellar arteries, and have a course near vital structures such as floor of the fourth ventricle, pons, medulla and foramina of Luschka. The increasing use of the operating microscope has created a need for an accurate understanding of the microsurgical anatomy of the choroidal arteries in the posterior fossa.

Material and method: arteries of 30 fresh cadaveric cerebelli were injected with coloured gelatin and fixed in 10% formaldehyde solution. The specimens were studied under a microsurgical microscope.

AICA, PICA and superior cerebellar artery (SCA) were the main supplying arteries. AICA supplied the portion of the plexus in the cerebellopontine angles and adjacent part of the lateral recess of the fourth ventricle through foramina of Luschka, and PICA supplied the choroid plexus in the roof and medial part of the lateral recess of the fourth ventricle. The choroid plexus was further divided into smaller segments to facilitate the description of its blood supply.

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EXPRESSION OF HORMONES IN THYROID PARAFOLLICULAR CELLS IN THE RAT

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The study aimed at recognising hormone expression in thyroid parafollicular cells in the rat at various stages of individual life. The studies were performed on males of Wistar strain. Entire thyroid glands were taken from rats aging 17 days to 24 months of life. The material was fixed in Bouin's liquid and, then, embedded in paraffin. For the purpose of electron microscopy thyroids were fixed in 2.5% glutaraldehyde or in a mixture of glutaraldehyde with paraformaldehyde and embedded in epon. Using immunocytochemical techniques (ABC, streptavidin-coated colloidal gold) the following hormones were demonstrated in the thyroids: calcitonin, CGRP, somatostatin, NPY. The immunocytochemical reactions demonstrated that progressing age of the animals was accompanied by an increase in number of parafollicular cells which secreted calcitonin and CGRP. Thyroids of rats of age progressing from 17 days to approximately 3 months contained gradually increasing numbers of immunopositive cells. The preliminary content of 1 to 2 parafollicular cells per thyroid follicle increased later to a few or even more than ten parafollicular cells per thyroid follicle. The cells persisted at such a level till the age of one year, to decline thereafter. The most numerous immunopositive cells and also the most intense reaction were noted for calcitonin. Between 50% and 70% calcitonin-positive cells contained also CGRP.

In the case of somatostatin, thyroids of rats aging 17 days to 3 months contained only individual parafollicular cells: 3 to 5 cells per thyroid section. In older individuals numbers of somatostatin-producing cells gradually increased to around 100 cells per section in 12-month-old rats. In still older rats the immunopositive cell number decreased to 50 to 60 per section. In animals over 3 months of age the somatostatin-producing cells were usually present in few large clumps in the central part of the thyroid gland.

In the thyroids, presence of neuropeptide Y was also demonstrated. The positive reaction was observed in 18-month-old animals. In no other period of rat life was the peptide observed in thyroid parafollicular cells of the rat. Ultrastructural studies on the thyroids showed high secretory activity of parafollicular cells. The cells demonstrated extensively developed rough endoplasmic reticulum, contained numerous cisterns of Golgi apparatus, numerous mitochondria and secretory granules. Reactions with colloidal gold demonstrated that the investigated hormones were localised in secretory granules. Various hormones were present in the same granules.

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ANASTOMOSES BETWEEN TESTICULAR ARTERY AND PAMPINIFORM PLEXUS IN THE HUMAN SPERMATIC CORD

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**Introduction:** The reason of interest in existence of the arterio-venous anastomoses in human spermatic cord was previously experimentally proved flow of the blood, passing over the intratesticular blood circulation. That experiments lead to the conclusion, that testicular flow depends on presence, number and diameter of the contracting muscles of the intramural vessels in testicular artery. Most of the available studies were based on animal material, so the authors decided to study the human testicles.

**Material and methods:** A total of 25 testicles (aged 23 to 73 years) were studied. The testicular artery was cannulated and the testis together with the spermatic cord were infused with casting medium, until the resin flow of the testicular vein was noticed. After polymerisation of the resin the casts were prepared for scanning electron microscope examination.

**Results:** Each of the examined specimens contained testicular artery tightly surrounded by pampiniform plexus. Winding course of the testicular artery as well as circular imprints of smooth muscles were also noticed. We didn't find any direct arterio-venous anastomoses between the testicular artery and the pampiniform plexus veins. What was visible, was narrow seeming space between testicular artery and pampiniform plexus casts. That space, before tissue digestion, contained walls of testicular artery. In all examined specimen that seeming space contained thick net of capillary vessels. In our opinion that vessels are placed in tunica media and tunica adventitia of the artery, which means that they are kind of "vasa vasorum" of the testicular artery. SEM pictures show clearly that vessel net connected testicular artery with pampiniform plexus.

**Discussion:** Already de Graff noticed connection between testicular artery and pampiniform plexus. He observed, during injecting testicular artery, that not only the artery fills up, but also pampiniform plexus veins. Incontrovertible evidence of the connection came with Noordhuizen — Stassen experiments. Those experiments proved that part of the blood in pampiniform plexus veins comes directly from testicular artery. Japanese examined walls of testicular artery in mice and rat and they also found the presence of "vasa-vasorum". On our experiments we can base theory that "vasa-vasorum" of the testicular artery are actually arterio-venous anastomoses mediating in blood flow between testicular artery and pampiniform plexus. Circular smooth muscles in the wall of the testicular artery might act as the functional contractors regulating the flow through the testicle parenchyma.

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#### IMAGING OF LOCAL CHANGES OF THE BONE TISSUE DENSITY IN THE HUMAN CALVARIA

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The mechanical properties of the calvarial bones depend on the distribution of compact and cancellous bone tissue and on the level of their mineralization. The whole of chemical and architectural relationship of bones attribute to a proper biomechanical character of the entire skull, depending on bone density. The main goal of the study was to present the distribution of the local changes in bone tissue density in selected places of calvarial bones. This problem could be realized thank to elaboration of our own computer method enabling filtration of calvaria CT scans. The applied algorithm allowed us to show the borders between the areas characterized by different level of grayness intensity, which reflect the level of X-ray absorption by a bone and thus they reflect its density. After using filtration and conversion upon the positives in examined CT scans of the neurocranium, we could distinguish regions characterized by a similar level of grayness. The intensity of gray shades of distinguished regions reflects bone tissue density and it is positively correlated with it. It means that when the picture is darker on CT scan, then the density of the bone tissue is higher, and the structure is more compact. Visualized changes of density of the bone tissue seen in the tested structures were confirmed by densitometric tests on CT scans and allowed us to verify the correctness of used method of graphic imaging of local changes in bone tissue density. The largest changes in bone density were observed in the cranial suture and at the route of bone bands in the skull responsible for transmission of strains.

Piotr Szkodziak

#### USE OF PICTURES MORPHING TECHNIQUE IN SIMULATION OF DEVELOPMENT OF FOETUS STRUCTURES AND MECHANISMS OF SOME INBORN DEFECTS

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Modern simulate techniques find wide use in process of create of movies' production at present and televisions', as so-called special effects. Moreover they are used in science, also medicine. Actual computers and suitable software it was possible to receive paintings and animations, which are simulation of compiled setting processes in human organism (e.g. simulation mechanics of ponds or introduction of anatomical relationships during surgical endeavours). Notion "Morphing" defines process, in which one picture is gradually transformed in different, creating illusion of metamorphosis oneself in short time. Analysing rule workings and effects of described technique test of her use was cut in simulating presentations intrauterine development of foetus structure as mechanisms of create some inborn defects (hernia, anomalies of limbs and spine and internal organs). Presentation was created using preparations and pictures finding oneself in department of Human Anatomy, Medical University in Lublin and own prints. Materials, introducing individual stages of foetus development and his structures was filmed with digital camera SONY DCR-TRV16E or was scanned with scanner PLUSTEK OpticPro UT12 in optical resolution 300 dpi, receiving suitable quantity of graphic files in format TIFF (Tagged of Image File Format). Got paintings became surrendered processing in programs PIXELA ImageMixer 1.0 as well as Corel PHOTO-PAINT 7.0 and Micrografix Picture Publisher 7.0. Using program BitMorph 3.0, sequences of video simulating development of structures of foetus as well as rise of some inborn defects were created. Presentation with the program Creator Pro 1.2d of firm Cenobyte were executed and it was placed onto CD-ROM. Observing effect of work it was possible to affirm, that morphing technique is useful in lively organism, relate his development or functioning perfectly to create of simulation of setting processes. It facilitates didactic connected processes from them also meeting.

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#### SURGICAL ANATOMY OF EYELIDS

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Eyelids are the frequent location of skin neoplasm, injury or other defects that need a surgical intervention. Surgical treatment and reconstruction of eyelid and periocular defects is difficult due to complexity of anatomical structure and function of this region of a face.

Concerning surgical intervention one must determine which lamellae of eyelid are involved and how large area is to be treated. Therefore detailed knowledge of anatomy is crucial for a surgeon who deals with tumour excision, defect reconstruction and cosmetic surgery of eyelids.

The aim of this paper is brief presentation of issues according to surgical rules of eyelid reconstruction that are directly based on the anatomy.

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#### VENOUS DRAINAGE OF THE MIDDLE LOBE OF THE RIGHT LUNG IN MAN

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The aim of the study was to investigate the ways of venous drainage of the middle lobe segments of the right lung. The studies were performed on 30 organs taken from both sexes human adult cadavers of different age. Pulmonary vessels and bronchi were filled with Plastogen G and then the corrosion casts were made, which were skeletonized.

The segments of the middle lobe of the right lung were drained in 64% of specimens by one vein and in 36% of specimens by two separately terminated veins. These vessels emptied into the superior right pulmonary vein, except one specimen, where one of two separately veins emptied into posterior segmental vein (V2) of the upper lobe.

In these sentences, where the middle lobe was drained by one vein (64%), joining the lateral segmental vein (V4) and the medial segmental vein (V5) formed it. These segmental veins were formed by junction their typical subsegmental tributaries e.g. V4 from V4a and V4b, while V5 from V5a and V5b in 37% of specimens. The subsegmental branches V4a and V5a were intersegmental veins, whereas subsegmental branches V4b and V5b were intersegmental veins.

In 18% of specimens (from the group of remaining 27%) V4a only formed V4, while V5 was composed of V5a + V5b + V4b. In 9% specimens of these group (from 18%) V4a run untypical above bronchi and emptied also untypical into middle lobe vein from the side of superior medial surface and not from inferior lateral surface as in the other specimens. In remaining 9% of specimens (from 27%) other untypical variants occurred, where V4 was formed only by V4b, while V5 by junction V5a + V5b + V4a or V4 was formed by V4a1 + V4b + V5b and V5 by V5a + V4a2.

In the middle lobes, which were drained by two separately veins (36%) there were independently running segmental veins V4 and V5 and their typical subsegmental tributaries formed them. They run in 24% of specimens on the medial surface of the lobe, whereas in 12% of specimens one of them run near to the superior surface of the lobe and the second on the medial surface.

The bronchial pattern of the middle lobe of the right lung conformed to the venous pattern of this lobe in 64% of specimens.

The most aberrant types of venous drainage of the middle lobe were noticed in these lobes, where the horizontal fissure was rudimentary or it wasn't at all, that is to say in bilobed right lungs.

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VARIABILITY OF FEMALE THYROID GLAND VOLUME ON THE BASIS OF ULTRASONOGRAPHIC MEASUREMENTS — INITIAL EXAMINATIONS

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The aim of the study was to evaluate the age dependent variability of thyroid gland volume in healthy women. 70 women at age 21–75 underwent the ultrasound examination. All the patients were coming from city of Wrocław and they had never had any thyroid complains. Measurements were performed by: Aloka SSD 1700 — linear probe 7,5MHz. The echostructure of the parenchyma and eventual focal lesions were estimated. The cases with thyroid struma or the presence of any focal lesions were rejected. The volume of thyroid gland was calculated using the formula for rotative ellipse in Brunn's modification:  $L(\text{length}) \times W(\text{width}) \times T(\text{thickness})$  of thyroid lobes  $\times 0,479$ . Each lobe volume was calculated separately and then the results were summed up. The volume of the thyroid isthmus was omitted. Results were compared with the age, weight and height of examined women. It has turned out that the volume of female thyroid gland was independent of weight and height as well. The significant decrease of thyroid volume was observed in older women at age 60–75. The volume decrease was bigger for the right lobe. The variability of thyroid volume was distinctly smaller in the perimenopausal women at age 45–55. Obtained results are very interesting and the studies will be continued on more numerous population.

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VASCULARISATION OF THE MYOMATOUS UTERUS — TRADITIONAL METHODS OF INJECTION STUDY

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The traditional injection method was used to study the vascularization of the myomatous uteri. Studies were carried out on 28 myomatous uteri obtained from cadavers (22 to 75 years of age) during autopsy. The vascular bed of the whole uteri was injected with coloured acrylic emulsion (Liquitex R., Binney and Smith, USA), 24 uteri were injected through the uterine arteries and 4 through the veins. Next the uteri were cut into slides about 5 mm wide. Then the slides were diaphanized in methyl salicylate. 11 injected uteri were cut into microslides (4  $\mu\text{m}$ ) and analyzed under the light microscope. There are usually very few arteries (3–5) present in the center of uterine myoma, while the major vessels nutritioning the tumors can be found on the periphery of the neoplasm. They originate probably from the „maternal” vascular bed of the normal uterine vessels and are incorporated into the growing tumor. Venous blood supply of uterine leiomyoma is very poor comparing to very rich venous vascularization of normal uterus. The vessels of the normal uterine tissue seem to be compressed and partially distended, both according to the arteries and veins.

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BLOOD SUPPLY OF UTERINE LEIOMYOMA

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The injection method was used to study the vascularization of the uterine leiomyoma. Studies were carried out on 50 myomatous uteri obtained from cadavers (22–82 years of age) during autopsy. The vascular bed of the whole uteri was injected with coloured acrylic emulsion (Liquitex R., Binney and Smith, USA), 24 uteri were injected through the uterine arteries and 4 through the veins. Then the slides were diaphanized in methyl salicylate. 22 uteri were injected with acrylic emulsion (Mercox CL-2R, Japan, Villene Comp. Ltd., Tokyo), to prepare microcorrosion casts. It is possible to distinguish two basal type of vascularization of uterine leiomyoma: a myoma with few (3–5) arteries present in the center which give off the branches penetrating the mass of the tumor into depth about 2/3 of its circumference and very rich peripheral blood supply and myomas with irregular blood supply. The surfaces of casts of venules and capillaries proved the presence of multiple, short vascular buds, what confirms the angiogenesis in the tumor. No signs of buds fusion was observed.

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VEINS OF THE LUMBO-SACRAL SPINAL CORD DURING THE PRENATAL PERIOD. CORROSION CASTS SEM STUDY

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The studies were carried out on 16 human fetuses aged between 17–23 weeks. The whole vascular bed of fetuses was injected with a resin Mercox CL-2R. Next it was analyzed in a scanning electron microscope. The researches were carried out on the venous system of the human fetal lumbo-sacral spinal cord. A great variability of the vessels both according to the number and location of the vessels was stated. The veins were subdivided into two categories: internal and external veins. The course of the internal veins was similar to the central arteries, but the veins did not go in a company with the veins. The peripheral veins however emerged radially on the surface of the spinal cord. The external veins drained the blood from the internal veins, carrying it into internal vertebral plexuses. The caliber of majority of veins in studied fetuses comparing to the remaining fragments of the spinal cord was the largest in the lumbo-sacral portion.

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#### THE TYPE OF THE PACING LEAD AND THE DEGREE OF MORPHOLOGICAL CHANGES IN THE PERMANENTLY PACED HEART — A MORPHOLOGICAL STUDY

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Permanent cardiac pacing is the treatment of choice in specific arrhythmias and conduction disturbances. However there is no further data regarding the morphological changes of the heart and the type of implanted electrodes especially in the light of lead removal. In relation to this it was decided to examine the anatomical conditions of the implanted pacing leads regarding the insulation of the lead.

Research was carried out on autopsy material consisting of 60 adult human hearts of both sexes (24 F, 36 M) from 45–95 years of age (avg.  $63 \pm 15$  years). All investigated hearts were from the patients with VVI or DDD pacemakers that were implanted as a treatment of AV block. There were 28 electrodes with silicone rubber insulation (Sorin, Biotronik) and 32 polyurethane-insulated leads (Biotronik, Siemens) implanted.

In 43 of the examined hearts (71.6%) the lead passed between chordae tendinae caused their thickening. The degree of progressive thickening depended statistically significant ( $p < 0.05$ ) on time of implantation ( $< 6$  mths vs  $> 10$  yrs) only not on the inserted electrode's type (NS). On the lead's tip in the right ventricle in 52 hearts (86.6%) we observed fibrous thickening also. The degree of this fibrous reaction increase (tendency only,  $p > 0.08$ ) with the time the lead was in place ( $< 8$  yrs vs  $> 10$  yrs) and the lead tip (more extensive in a bulbous tip, rather than with a tined tip).

In summary, on the basis of our morphological study we stated that fibrotic reaction occurs at contact's sides of the electrodes with the endocardium. The amount of the fibrocollagenous sheat that tissue highly depends on the time of contact not the type of the electrode.

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#### ANTERIOR REGION OF THE ATRIOVENTRICULAR PERINODAL AREA IN RELATION TO THE RADIOFREQUENCY ABLATION PROCEDURES

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Atrioventricular nodal reentry tachycardia base on reentry circulation in nodal-perinodal area. The radical treatment of choice is radiofrequency ablation. Procedure approached from the anterior-superior (fast) region sufficient a few seconds of energy delivery for succes, however this can result in a-v block. The possibility that arrhythmias substrate may lie very superficial (succes of ablation) and damage the normal structures (complication) in the perinodal region must be considered. In order to confirm this hypothesis we took observation on the autopsy material of 50 normal hearts, both sexes from 18 to 81 years of age (control) and 50 hearts with a-v total block 45–95 years of age (block). We paid attention on the morphology of the nodal artery (NA), atrial inputs (AI) and transitional inputs (TI).

It was observed that NA at the level of central fibrous body was positioned in 94% in the central and in 6% in the inferior part of the Koch's triangle. It was removed from the endocardium 3–6 mm in control and 2–5 mm in block group respectively (NS). In the perinodal area we distinguish AI that directly joined the a-v compact node: superficial (right part of the interatrial septum) or deep (left part). The first of mentioned occurred in 100% of controls and in 80% of block groups (NS), and the last in 80% of control group and in 33.3% in block respectively ( $p < 0.05$ ).

Conclusions: 1) the real substrate of arrhythmia in anterior-superior region lies very superficial and far from the conduction tissue, 2) NA in examined hearts was laying deep beneath the endocardium, 3) ablation close to the node could result in a-v block.

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#### DEVELOPMENT OF THE A-V JUNCTIONAL AREA IN THE HUMAN HEART

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The heart was the subject of many observations regarding its structure reach the beginnings of medical research. Systematizing information began with "Anderson" model, which differentiated 4 zones: transitional cells zone, compact node, penetrating bundle and branching bundle. However "Becker" model determined that the initial portion of the node does not occur in all hearts. Furthermore clinical researches entailed electrophysiological evaluation of the node with regards to arrhythmias without any reference to anatomical research. With regards to the above on the basis of histological study we decided to evaluate in detail the morphology and the topography of the various portions of the a-v junction.

In order to confirm this hypothesis we took observation on the autopsy material of 100 normal human hearts, both sexes from 16 weeks of foetal life to 105 years of age, in which no pathological changes or inborn faults were found. Sections were done containing the heart's septum stained using Masson's method with Goldner's modification.

Evaluating on the basis of histological examination the morphology and the relative position of various types of cells we could further differentiate six zones forming atrioventricular junction: a-v nodal area (prenodal zone, perinodal zone, compact zone) and a-v bundlar area (penetrating zone, nonbranching zone, branching zone). The prenodal zone consisted of two bundles: a superior and inferior and perinodal of two layers of transitional cells: posterior (coronary orifice area) and anterior (oval fossa area) (all examined hearts). Within the compact zone we differentiated three parts-initial (three-parts in foetuses, newborns and infants; two-parts in adult hearts), main part (convex in foetuses and infants; less convex in children and young adults; very flat in older adults) and the terminal part. Within the cells of compact zone fibrous tissue made 2 (young hearts) up till 6 (older hearts) compartments of nodal tissue and their cells pass over the right fibrous trigone form in 70% islets ("tongue"-like 80%, "loop"-like 20%), especially in the very young (foetal) and old (older adults) hearts. Penetrating zone of the bundle is the homogenous structure and completely bounded by sheat of connective tissue. With regards to the topography, it is located in the membranous septum. The nonbranching zone does not differ morphologically from penetrating, but the difference was in its topography. It was not stable structure, as occurred in only 10% of hearts (only older one). The branching zone was then the right and left branches were starting from. Within the penetrating zone fibrous tissue made 2–5 (only older hearts) compartments of tissue and their distal cells could form in 5% of examined hearts islet ("tongue" like only — 100%), especially in the very young (foetal) and old (older adults) hearts. With increasing age we observed morphological changes also — it resulted in an increase in the number of loose collagen fibres, which were loosely scattered in adipose tissue and between proper cells of the conduction system of the heart.

We concluded that in examined hearts the elements of the atrioventricular junction is a stable structure occurring in all hearts, undergoing involuntary changes with age, in which two main parts can be differentiated: nodal and bundular. The morphology of the node is very complex, in contrast to this bundle is more stable. The topography of the node (interatrial septum) and bindle (membranous septum) is generally stable.

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#### PRELIMINARY STUDY OF EXTERNAL INTER-ATRIAL MUSCLE FASCICLES

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The atria are highly complex multidimensional structures composed of a heterogeneous branching network of subendocardial muscular bundles. The relief of the interior of the right atrium includes the crista terminalis as well as multiple pectinate muscles that bridge the thinner atrial free walls and appendages. However, a handful of studies have focused attention on the role of the naturally occurring complexities of the atrial subendocardial muscle structures in the mechanisms of cardiac arrhythmias. In relation to this, it was decided to examine the morphology and topography of the external interatrial junctions and related structures in order to eventually define the anatomical basis of the impulse propagation in focal atrial fibrillation. Research was conducted on material consisting of 15 human hearts of both sexes (female — 6, male — 9) from the age of 18 to 82 years of age. In addition we concerned, based on the history and electrocardiograph tracings, that no of any patients has shown focal and non-focal type of atrial fibrillation. The classic macroscopic methods of anatomical evaluation were used. The walls of the atria were prepared via a stereoscopic microscope. Due to exact observation, the pericardium and fatty tissue was eliminated from the surface of atria visualising muscle fibres linking both of the atria. Thereafter the beginnings and the endpoints of fascicles in the right and in the left atrium were estimated. The structure, large muscle bundle, was present in all examined hearts. The muscle fascicle was descending from the anterior wall of the right atrium just below the orifice of superior vena cava. The fascicle, running towards the left atrium, divided into two branches, one of which joined with the superior fascicle from the posterior wall and created one running above interatrial septum and infiltrating into the wall of the left atrium on its superior surface between superior pulmonary veins. The other branch of the anterior fascicle was running across the anterior wall of the atria and penetrated into left atrium muscle in the region of inferior pole of left auricle outlet. On the posterior wall of atria three types of interatrial fascicles were distinguished: unifascicular, bifascicular and trifascicular. The most frequent configuration was the bifascicular type (9 cases — 60.0%), 5 cases it was trifascicular (33.3%) and finally the unifascicular configuration was observed in just 1 heart (6.7%). On the basis of our study we can conclude that the external interatrial fascicles are the constant structure of the heart, although they may have a variable morphology. Those structures could be responsible for physiological conduction between the atria and may important role in patients with atrial fibrillation.

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#### CLINICAL ANATOMY OF THE TRICUSPID VALVE INSUFFICIENCY IN PERMANENTLY PACED PATIENTS

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The permanent cardiac pacing is a treatment of choice in those disturbances of atrioventricular conduction which are the reason of syncope. There is inserted pacing lead to the right ventricle in such situations. The lead is based on the tricuspid valve apparatus and it can lead to the tricuspid valve insufficiency. The aim of our study was to estimate degree of the tricuspid regurgitation in anatomical and echocardiographical examinations. We examined 32 paced hearts (VVI), mean age 66–95 (14F, 18M) by means of classical gross inspection. Echocardiographic examination was performed in 5 patients (VVI, DDD), mean age 55–93 (5M); colour-flow Doppler was taken to appreciate extension of regurgitant jet through the tricuspid orifice.

At level of the tricuspid annulus the lead ran at level of the septal leaflet in 25% examined hearts, at level of the posterior one in 41%, and at level of posteroseptal commissure in 34%. Below of the tricuspid valve, the lead was penetrated between the chordae tendinae of the tricuspid valve apparatus in 84% examined hearts or between trabeculae carneae in 32%. Till in 22 hearts inflammatory process between the lead surface and endocardium included the lead and also the tricuspid valve caused immobilization of its leaflets: (+) was stated in approximately 19% hearts (posterior leaflet), (++) in 18% (posterior and septal leaflets), (+++) in 63% (posterior, anterior and septal leaflets).

Simultaneously we observed position of the lead at level of the tricuspid valve in echocardiography. In 2 patients lead ran at level of posterior leaflet of the tricuspid valve, in 2 consecutive between anterior and septal leaflets, and in 1 at level of septal leaflet. The results of Doppler examination are following:

Year of implant	Lead position	Annulus diameter (cm)	Depth of TR jet (cm) [degree]	Area of jet (cm <sup>2</sup> ) [degree]
1988	Central	3.0	4.6 [IV]	6.13 [III]
1991	Anterior	4.0	6.6 [IV]	7.5 [III]
1992	Poster	2.0	2.7 [II]	4.1 [III]
1998	Anterior	2.0	2.0 [II]	1.0 [I]
1998	Central	2.4	1.5 [I]	0.9 [I]

Conclusions: 1. Direct contact between surface of electrode's lead and the endocardium can cause inflammatory process between them and lead to immobilization of leaflets of the tricuspid valve. 2. Echocardiography reveal that the time of stimulation can intensify of the tricuspid insufficiency. Assessment of the tricuspid regurgitation and its effect on hemodynamics of the right ventricle requires further researches

Agnieszka Anasiewicz, Róża Czabak-Garbacz, Małgorzata Anasiewicz, Jarosław Korzan, Marek Korzan, Urszula Cieślak, Dorota Romańska-Sys

#### EVALUATION OF EMBRIOTOXICITY OF PAROXETINE HYDROCHLORIDE IN SWISS ALBINO MICE

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Paroxetine hydrochloride /PAXIL/ is an orally administered antidepressant with a chemical structure unrelated to other selective serotonin reuptake inhibitors or to tricyclic, tetracyclic or other available antidepressant agents.

The aim of this study was to investigate the influence of paroxetine hydrochloride on the development of Swiss albino mice foetuses.

The studies were performed as recommended by WHO.

Pregnant females (12 animals in each group) were treated by gavage in doses 5.0, 10.0, 15.0 mg/kg body mass of paroxetine hydrochloride on each days from the sixth to eleventh day of pregnancy. Controls were performed on three groups of pregnant females: UC - untreated control, TC - treated with water and Tween 80 by gavage in equal volume, ST - females receiving chlorometine hydrochloride as a standard teratogen.

Pregnant females were euthanised and caesarean sections were performed on 18th day of gestation. After preparation of uterus the number of implantations, early and late resorptions as well as living and dead foetuses were counted. The evaluation of birth defects of internal organs was carried out according to Wilson's technique in Barrow's and Taylor's modifications. Foetuses void of viscera were subjected to a single staining of skeleton according to Dawson's alizarin method or with double stain of osseous and cartilaginous elements according to Peter's method.

On the basis of this study it has been found out that paroxetine hydrochloride in doses 5.0, 10.0, 15.0 mg/kg body mass has not embryotoxic effects.

Agnieszka Anasiewicz

#### FETOTOXIC EFFECTS OF 3-AMINO-DIPHENYLOHYDANTOIN IN SWISS ALBINO MICE

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The aim of this experiment was to study the influence of new chemical compound 3-amino-diphenylhydantoin on the development of mice Swiss albino strain.

The studies were performed as recommended by WHO.

Pregnant females (12 animals in each group) were treated with 1/50, 1/100, 1/250, 1/500, 1/1000 of DL50 (720 mg/kg body mass) of 3-amino-diphenylhydantoin by gavage on each days of gestation from 11th to 17th of gestation (plug day = day 0 of gestation). Controls were performed on four groups of pregnant mice: 1/ UC - untreated control, 2/ TCa - treated with water by gavage in equal volume, 3/ TCb - treated with carboxymethylcellulose by gavage in equal volume, 4/ ST - mice receiving intraperitoneally /i.p./ 0.26 mg/kg body mass chlorometine hydrochloride as a standard teratogen.

Pregnant females were euthanised and caesarean sections were performed on 18th day of gestation. The implantation sites were recorded as live, dead and resorbed foetuses. The weight of foetuses and the placenta and the length of foetuses were evaluated using Student's t test. The evaluation of birth defects of internal organs was carried out according to Wilson's technique in Barrow's and Taylor's modifications. Foetuses void of viscera were subjected to single staining of skeleton according to Dawson's alizarin method or with double stain of osseous and cartilaginous elements according to Peter's method.

On the basis of this study it has been found that 3-amino-diphenylhydantoin has the fetotoxic effects in doses 1/50 and 1/100 of DL50.

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#### INFLUENCE OF VINCRISTINE SULFATE AND CALCOPHEROUS DRUGS ON THE STRUCTURE OF THE FEMUR OF YOUNG WISTAR FEMALES

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The aim of this study was to assess the degree of mineralisation and crystallisation of proximal epiphysis and diaphysis of femoral bone in experimental osteoporosis induced with vincristine sulfate and treated with calcopherous drugs.

The research material were 8 groups of Wistar strain females, 130–140 g body mass:

- 1 — untreated control,
- 2 — treated control, physiological saline intraperitoneally /i.p./ 0.5 ml/kg b.m. every day,
- 3 — vincristine sulfate /Vincristin sulfas Richter Gedeon Rt./, i.p. 1.4 mg/m<sup>2</sup> six times every 144 hours,
- 4 — 10% solution of calcium i.p. 15.0 mg/kg b.m. 2xday and 200 j.m. vit.A with 100 j.m. vit.D<sub>3</sub> /Vitaminum A+ D<sub>3</sub>, Terpol, Poland/, every day,
- 5 — vincristine sulfate, calcium, vit.A+D<sub>3</sub> identical doses and way,
- 6 — micalcalcic /Micalcalcic, Sandoz, Switzerland/ i.p. 5.u./kg b.m. every day,
- 7 — vincristine sulfate and micalcalcic, identical dose, way and time of administration,
- 8 — vitaminum A+D<sub>3</sub>, identical dose, way and time administration.

The rats were euthanised on 42<sup>nd</sup> day of the experiment. The femur were taken out for histological studies and mechanical strength examinations. The strength properties of the diaphysis of femur were determined using Instron 4302 machine. The femur in the horizontal position was supported in two points and was loaded in the centre till the moment of the fracture.

On the basis of this study of structure of femoral bone it has been observed that administered vincristine sulfate caused considerable damage. The mechanical strength of femoral bone it has been observed that administered vincristine sulfate caused considerable weakness. The osteoporotic effect of vincristine sulfate may be reduced by concomitant administration of calcopherous drugs.

Jerzy St. Gielecki, Hanna Kozłowska, Dariusz Cieśla

#### COMPUTER SIMULATIONS OF CEREBRAL BLOODFLOW IN ASYMMETRICAL FORMS OF CIRCLE OF WILLIS

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Computer simulations of cerebral bloodflow were carried out on asymmetric forms of circle of Willis. An analysis of flow in afferent arteries in communicating and post-communicating segments of cerebral arterial circle was carried out. An analysis of pressure distribution in nodes of cerebral arterial circle was also performed. Morphological parameters of communicating and post-communicating segments of cerebral arteries were set according to two opposite forms of cerebral arterial circle (A, B). As a result of a simulation blood flows for symmetrical form A and B as well as asymmetrical form A/B were compared. A model with parameters characteristic for form A on the left side and form B on the right side were considered as an asymmetrical type.

Table 1. Flows in post-communicating and communicating segments in symmetrical and asymmetrical forms of the cerebral arterial circle

	ACoA (cm <sup>3</sup> /s)	PCoA (cm <sup>3</sup> /s)		P2 (cm <sup>3</sup> /s)		A2 (cm <sup>3</sup> /s)		M1 (cm <sup>3</sup> /s)	
		Right	Left	Right	Left	Right	Left	Right	Left
<b>Form A</b>	0.005	0.085	0.085	1.935	1.935	1.297	1.297	2.615	2.615
<b>Form B</b>	0.005	1.675	1.675	1.93	1.93	1.275	1.275	2.57	2.57
<b>Form A/B</b>	0.215	1.793	0.026	1.931	1.983	1.278	1.294	2.572	2.612

Total flow symmetry was found in all the segments in models A and B, as well as in A2 segment of anterior cerebral artery, P2 segment of posterior cerebral artery and M1 segment of middle cerebral artery of asymmetrical A/B model. Symmetry of pressures in cerebral arterial circle's nodes was also found during the analysis of symmetry of models A and B. The asymmetric model was characterized by asymmetrical flows in supplying arteries of cerebral arterial circle (internal carotid arteries and vertebral arteries) as well as creation of increased flow within anterior communicating artery (Tab. 1). This increase in flow is caused by asymmetrical pressures in points of connection of anterior communicating artery with A1 and A2 segments. The results of studying asymmetrical flows in clinical examination do not always point to difference in diameter of arteries. They may be a result of asymmetrical form of cerebral arterial circle like in model A/B.

Krzysztof Grabowski, Marek Grzybiak

#### IS THERE ANY INFLUENCE OF VALUE OF AORTIC ANGLE ON ATHEROGENESIS OF THE ARTERIES OF THE LOWER EXTREMITIES?

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Atherosclerosis is the most common cardiovascular disease and one of the most frequent causes of death in majority of European countries and North America. Theories of atherogenesis, especially focal distribution of atherosclerotic plaques are not satisfying. There are many risk factors: age, sex, race, diet, hypertension, obesity, diabetes, disturbances in metabolism of lipoproteins, smoking, lack of physical exertion. It was observed 150 years ago, that atherosclerotic plaques preferentially occurring at curvatures and bifurcations. The different opinions on the subject were inspiration for our investigations. Arteriograms of common and external iliacs, femoral and popliteal vessels were studied from anatomical and geometric points of view. There were patients: 98 males (the average age was 56.3) and 17 females (the average age was 58.4). All patients were hospitalized at Municipal Hospital in Elbląg and were prepared to vascular reconstructive operations. Statistic verifications of data was performed. Our previous results were not univocal, but now we can state: — large variability of aortic angles,  $48.8^\circ \pm 24.6^\circ$  [ $24.2^\circ$ – $73.4^\circ$ ] (mean  $\pm 2SD$ ) range  $20^\circ$ – $98^\circ$   
— lack of any correlation between value of aortic angle and age, sex and levels of atherosclerotic changes.

Janusz Gorczyca, Agata Musiał, Tomasz Iskra, Ewa Mizia, Marek Sajewicz, Wiesława Klimek Piotrowska, Andrzej Gryglewski

#### THE VARIABILITY OF EXISTENT OF THE SUPERIOR POLAR ARTERY AND POSTERIOR GASTRIC ARTERY AND THEIR PARTICIPATION IN VASCULARISATION OF HUMAN FETAL STOMACH

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The authors investigated the frequency of the occurrence of the splenic artery branches i.e. short gastric arteries; posterior gastric artery and superior polar artery in the vascularization of the stomach fundus divided into quadrants. The material included 52 human fetuses of the parietococcygeal length range from 127 to 289 mm and the gestational age of 15–28 weeks. It has been found that the short gastric arteries supply the stomach fundus constantly. The occurrence of the other two branches was observed in 88.5% cases (the posterior gastric artery — 65.3% and the superior polar artery — 25%). The coexistence of both branches was observed in 1.92% cases. It has been concluded that all the branches of the splenic artery play a significant role in the blood supply of the lateral and posterior median quadrants. The posterior lateral quadrant was supplied by 3–4 branches of the posterior gastric artery (30 cases), the superior polar artery (11 cases) and short gastric arteries (8 cases). The anterior lateral quadrant was usually supplied by a single branch of the short gastric arteries (33 cases), the posterior gastric artery (2 cases) and the superior polar artery (1 case). It has been found that only in four subjects the splenic artery vascularized the anterior medial quadrant: in 3 cases by the posterior gastric artery and in 1 case by the short gastric arteries.

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Grażyna Piszczatowska<sup>2</sup>, Magdalena Kozłowska<sup>2</sup>, Rafał Kamiński<sup>2</sup>,  
Marek Grzybiak<sup>2</sup>, Krzysztof Bigus<sup>2</sup>

#### THE TOPOGRAPHIC ANATOMY OF THE SUBTHEBESIAN FOSSA WITHIN THE RIGHT ATRIUM

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Within the right atrium one can find concavity in the region of coronary sinus orifice and inferior vena cava orifice. Koch was the first who noticed the presence of this fossa in the beginning of XXth century, but he did not examine this area. Some concavity placed in the same anatomical area is also well shown on one of the figures in the Textbook of Human Anatomy written by Bochenek and Reicher, but there is no detailed information about this structure. It seems that this concavity called the subthebesian fossa, can be very interesting anatomical structure from cardiologic point of view. The detailed knowledge of the topography of this structure could be helpful especially in cardiologic electrophysiology. Regarding the facts mentioned above we decided to examine the topography of the subthebesian fossa.

Research was conducted on material consisting of 50 human hearts of both sexes from age 19 to 71 years. The hearts came from patients whose death was not cardiologic in origin. We examined subthebesian concavity in relation to neighboring structures: coronary sinus orifice (CSO), inferior vena cava orifice (VCIO) and attachment of the posterior leaflet of the tricuspid valve (APLTV). We measured distances between concavity and CSO (distance A), VCIO (distance B) and APLTV (distance C). Besides we measured two longest diameters within the inlet plate of subthebesian fossa and its deepness. We found that the subthebesian fossa was present in 45 examined hearts (90%). Diameter A was from 2 to 7 mm (avg.  $5 \pm 2$  mm), diameter B from 2 to 8 mm (avg.  $4 \pm 3$  mm) and diameter C from 5 to 9 mm (avg.  $7 \pm 3$  mm). The two longest distances in the inlet plate were from 12 to 18 (avg.  $14 \pm 4$  mm) and from 7 to 14 mm (avg.  $9 \pm 5$  mm), respectively. The deepness of examined concavity was ranged from 2 to 7 mm (avg. 5 mm). The thickness of the inferior wall of the right atrium in the area of subthebesian fossa was very thin and in 8 cases (16%) it was even pellucid.

Conclusions: The subthebesian fossa occurs in majority of examined hearts (90%). It seems that subthebesian area is important structure in invasive cardiology especially electrophysiology and it may influence on ablation procedures in this region. The exact usefulness of subthebesian fossa in electrophysiology requires more clinical and anatomical researches.

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#### COMPUTER SIMULATIONS OF CEREBRAL BLOOD FLOW DURING THE VERTEBROBASILAR INSUFFICIENCY

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The computerized simulations of circulatory disturbances in vertebral arteries (VA) and basilar artery (BA) were performed and classified as flow disorders within the vertebrobasilar circulation. The flow simulations were studied in three main configurations (A, B, C) of the cerebral arterial circle of Willis (CW). The simulations were performed according to the established criteria of the symmetry of the circular segments. The localization of brain lesions and accompanying clinical manifestations of ischemia within the anterior, medial and posterior part of posterior circulation were characterized [1], by performing simulations of basilar artery occlusion (BAO) or stenosis (BAS) [2]. The simulations were performed with use of a computer program "Sym-Flow2K". This program allows to simulate occlusion in the basilar artery and to analyse circular and post-communicating segments insufficiency of three main cerebral arteries. The parameters of the program were set to linear resistance of blood flow in circular segments and symmetry of vessels. The sensitivity of three main configurations (A, B, C) of CW to BAO and BAS was described. It was discovered that configuration of CW plays an important function in the redistribution of flow and in producing the secondary, compensatory hemodynamics disorders. The results show an important role of the cerebral hemodynamics changes in pathogenesis of the vertebro-basilar insufficiency syndrome. The results suggest that blood flows don't change significantly as a result of the supplying arteries occlusion. Occlusion of the afferent arteries — such as basilar artery — causes the flow disorders within parts of brain, which are the most sensitive for limits of autoregulation.

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#### COMPUTER SIMULATIONS OF BLOODFLOW IN MOYA-MOYA SYNDROME

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Computer simulations of bloodflow were carried out on cerebral arteries considering morphologic and hemodynamic features in Moya-Moya syndrome (MMS). MMS is characterized by chronic progressive bilateral stenosis or occlusion of the internal carotid arteries (ICA) with creation of rete mirabile. The pathogenesis of MMS is unknown. Ischemic symptoms of patients with MMS are typically invoked by hyperventilation, physical exertion or an inflammatory process. Although MMS was first described in Japan (1957), diagnosed cases with clinical documentation were discovered in Poland as well [1].

For the purpose of this study, CFM02 program was used for the quantitative description of the cerebral bloodflow with consideration of hemodynamic autoregulatory mechanisms of the cerebral perfusion. The study presents a computer simulation of the cerebral bloodflow in three ontogenetic variations of the circle of Willis. For the purpose of the study the communicating arteries were considered as symmetrical. Circulatory disturbances were simulated with by occlusion of ICA. The amount of blood perfusion was estimated in the post-communicating segments of the cerebral arterial circle. Analysis was carried out on perfusion in A2 segment of the anterior cerebral artery, P2 segment of the posterior cerebral artery and in M1 segment of the middle cerebral artery. Perfusion in communicating segments of the cerebral arterial circle: anterior communicating artery (ACoA) and posterior communicating artery (PCoA) was also estimated. Results of the simulation, presented in table 1 account only for the parameters of beginning and ending fractions of tested bloodflow.

Tab. 1. Bloodflow in post-communicating and segments of the cerebral arterial circle.  $F_0$  – beginning fraction,  $F_K$  – ending fraction

	ACoA (cm <sup>3</sup> /s)		PCoA (cm <sup>3</sup> /s)		P2 (cm <sup>3</sup> /s)		A2 (cm <sup>3</sup> /s)		M1 (cm <sup>3</sup> /s)	
	$F_0$	$F_K$	$F_0$	$F_K$	$F_0$	$F_K$	$F_0$	$F_K$	$F_0$	$F_K$
Typ A	0.26	0.705	0.543	2.451	1.941	1.905	1.35	1.059	2.729	2.097
Typ B	2.031	0.205	0.751	3.097	2.047	1.446	1.348	0.975	2.728	1.917
Typ C	3.845	3.252	0.39	0.438	2.036	1.878	1.35	1.226	2.727	2.464

The study shows that there is an essential influence of ICA occlusion on decrease of bloodflow in all researched arterial segments. Major decrease of flow was observed in M1 segment in all three ontogenetic types of circle of Willis. The least sensitive to occlusion was type C. In the connecting segments (PCoA, ACoA) an initial decrease was observed followed by a compensating increase in flow.

The CFM02 program allows the user to evaluate deficiency of bloodflow in afferent and post-communicating segments, thus giving an opportunity to predict clinical effects of circulatory disturbances in afferent segments of the brain.

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Placek W., Świder R.

#### PRESENT VIEW ON EPIDERMAL-DERMAL JUNCTION

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Epidermal-dermal junction is composed of 30 components, to discovery of which not only electron microscope and immunologic researchers but also discovery of genes coding some of those components contributed. Epidermal-dermal junction is created from four layers: basic surface of basic layer keratinocytes, lamina lucida (LL), lamina densa (LD) and sublamina densa (SLD). Proteins of hemidesmosoms were identified immunologically: bullous pemphigoid antigens BP Ag 1 and BP Ag 2. Epidermal-dermal junction is composed of such macromolecules as laminin 1 and 5, entactin/nidogen, collagen IV, proteoglycans, collagen VII, and others. Other components are: trombospondin, fibronectin, collagen V, complement component C3dg, linkin, osteonectin (SPARC, secreted protein, that is acidic rich in cysteine), fetal antigen FA 2, antigen NU-T2, and antigens reacting with antibodies KF-1, and anohing fibers SLD AF-1 and AF-2. Epidermal-dermal junction consists of contributions from both keratinocytes and fibroblasts. Responsible for adhering of the epidermis to the dermis are two functional compositors: hemidesmosomal complex and anohing fibrilles, sticking basal surface of keratinocytes of basal layer to LD and anohing fibers sticking LD to the dermis.

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#### THE NUMBER AND REACH OF PALATED PLEADS IN TWIN FETUSES

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The aim of this study is to conduct a classification of palated pleads and to define on this basis the number of palated pleads and their reach.

The study was conducted 72 pairs of twin fetuses (24 male, 24 female and 24 of different sex) aged between 4–7 months. The following results of the studies about twin fetuses were compared with analogous studies of 340 fetuses from single pregnancies (173 male and 167 female). The analysed material comes from spontaneous miscarriages and shows a normal process of development. The reach of palated pleads was described by absolute and quotientally numbers–index (indicator) of the reach of palated pleads:

- a. the reach of palated pleads / the length of the hard palate,
- b. the reach of palated pleads / the length of the palate without pleads,
- c. the reach of palated pleads / the complete length of the palate.

Bilateralous and dimorphous differences and variability with age were taken into consideration in the research. The analysis of features within twins was conducted bearing in mind intrapair variability (twins of different sexes and of the same sex) and interpair (comparison of specified pairs of twins).

On the basis of a conducted studies, it was ascertained that:

1. the number of palated pleads:
    - a. does not show any essential bilateral and dimorphous differences,
    - b. in pairs of twins of the same sex shows (bigger) similarity than in pairs of twins of different sex,
    - c. does not show an essential difference in twin fetus and in fetus from single pregnancy,
    - d. do not change essentially with age in fetal period,
  2. The reach of palated pleads:
    - a. does not show essential variability with age in a fetal period,
    - b. does not show essential bilateral and dimorphous differences,
    - c. shows bigger similarity in pairs of twins of the same sex than in pairs of twins of different sex,
    - d. does not differ essentially in twin fetuses and fetuses from a single pregnancies.
- The obtained results authorize the statement, that the explored characteristics show a strong genetical determination and are not subject to a significant influence of intrauterine environment.

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#### A SHAPE OF HARD PALATE OF TWIN FETUSES

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The aim of the study is to research the age variability of the twin fetuses' hard palate.

The research was carried out on 72 pairs of twin fetuses (24 male, 24 female, and 24 of the opposite sex) at the age of 4 to 7 months.

The results were compared to the similar research of 340 fetuses from single pregnancies (173 male, and 167 female). The analyzed material is taken from spontaneous miscarriages and represents a natural process of development.

Changes of palate's shape on horizontal surface are researched on the basis of the contours of alveodental line.

Changes of palate's shape are also examined by a "palate's width index" (quotient of hard palate's width at alveodental line back limit and at half of its length) and by "width-length index".

Dimorphic differences and age variability were taken into consideration in the study.

The analysis of features within the twins were carried out taking consideration

The variability inside the pairs (twins of the opposite sex, and of the same sex) and between the pairs (comparing the specified pairs).

Three specific forms of palate were described on the basis of the findings:

1. Round (elliptical) — shaped (OMEGA)
2. U-letter-shaped, with parallel arms
3. Parabolic-shaped.

It was affirmed on the basis of analyzed indexes and changeability of specified palate forms, that the shape of the palate changes considerably with age in human prenatal period.

Changes of palate shape in prenatal period strongly reflect the phylogenetic development of a human.

It was affirmed, that the shape of the palate differs between twins and fetuses from single pregnancies at similar period of development. This can indicate, that the development of twin fetuses is delayed, comparing to the fetuses from single pregnancies.

There are no statistic differences in twin pairs of the same and of the opposite sex.

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#### THE EXAMINATION OF SUBMANDIBULAR GLANDS IN HUMAN PRENATAL PERIOD

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The aim of this study is to determine the variability of measurements and metric features of submandibular glands in the human prenatal period.

The research was conducted on the material of 340 foetuses (173 male and 167 female) whose ages ranged from 4 to 8 months. The research material consisted of foetuses from spontaneous miscarriages which presented a normal process of development. The analysed material came from collection of

Department of Histology and Embryology of the Medical Academy in Bydgoszcz.

The shape of submandibular gland, topography with regards to mandibula's margin and muscles situated in submandibular triangle, facial artery and vein and also the measurements of the gland's length, width, thickness and mass were determined. Variability of age, bilateral and sexual differences were taken under consideration in this study.

Three specific forms of submandibular gland were distinguished:

- a. pyramid – shaped
- b. round – shaped
- c. elliptical – shaped

It was noticed that the location of submandibular gland was central or lower peripheral variant's with regard to submandibular triangle.

The position of submandibular gland with comparison to facial artery and vein were allowed to different a few kind of type of submandibular gland.

It was affirmed that organogenesis of submandibular gland's with regards to the shape and topography were finished in the 4 month of human prenatal period.

The analysed descriptive features of the submandibular gland did not show significant sexual and bilateral differences.

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#### CLINICAL USE OF THE GROIN REGION ANATOMY

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Groin hernia is the most common disease in the population that requires surgical intervention. The number of hernias operated within one year all over the world is estimated as several millions of cases. To unify the methodology of research and pretending to find the best operative technique authors propose to implement a unified protocol for hernia research. Since the years in Polish literature hernia was named according to anatomical nomenclature as inguinal or femoral depending on its organ.

For the surgeon who repairs hernia it is important as follows: hernial ring, it's size, and structure of surrounding tissues. That is why world classification omit the size of hernial sac. Nowadays for surgeon applying tension free hernia repair methods important is:

- is hernia in inguinal or in femoral canal
- is inguinal hernia located beside or among spermatic cord structures
- hernial ring (normal, dilated deep inguinal ring, defects in the posterior wall of inguinal canal)

According to this presently site of hernia and location of hernial ring determines nomenclature. Inguinal and femoral hernia are called groin hernias due to the site of hernial sac appearance. From this point of view it is not important where we find the hernial sac.

Nyhus and Rutkow classification is also common in Polish medical literature. That is why we propose to implement Polish nomenclature that will be complementary with those classifications.