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SELECTIVE VS. RADICAL CROSSECTOMY OF THE GREAT SAPHENOUS VEIN IN PRIMITIVE VENOUS INSUFFICIENCY: RESULTS AT 5 YEARS.

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ABSTRACT

Objective. The aim of the study is to keep again the incidence of groin recurrences at 5 years follow-up, on two groups of patients operated with a technique of selective crossectomy and radical crossectomy of the great saphenous vein (GSV), to verify the importance of the collateral veins of S-F junction in groin recurrences.

Background Data. The classic surgery of superficial venous system has had many improvements, so the "traditional" idea of radical crossectomy (Babcock, 1907) has been won by the "new" selective technique, which may be executed on traditional way or by the new endovascular techniques.

Methods. Non-concurrent prospective study, the selected casuistry concerns in 300 patients (220 F - 80 M, mean aged 54 years, range 25-77), CEAP 2-S/3 Ep As(2/3) Pr, operated from January 2002 to December 2006, choosed with random method, divided in two groups (150 treated by selective crossectomy and 150 by radical crossectomy), 60 patients for every year was considered.

All the patients were operated of crossectomy by an unique surgeon for each group, in day-surgery and local anaesthesia. All these patients were submitted to clinical venous examination and to Duplex scanning of the lower limbs, by an independent operator, at different times from the operation (the follow-up is from 5 years for the patients operated in 2002 to 1 years for the patients operated in 2006).

Results. On 300 patients controlled with Duplex has been seen in the group of selective crossectomy 1 groin recurrence (0,6%), in the group of radical crossectomy 14 groin recurrences (9,3%).

Conclusions. Based on the clinic experience done on examined 300 patients, we can observe like the internal selective crossectomy, saving the tributary veins coming from the abdominal wall, joint to the convenient treatment of saphenous insufficiency, revealed an efficacious therapy, giving results of undoubtable validity from the point of view prognostic and the rate of groin recurrences at 5 years.

Key words: crossectomy - venous surgery - great saphenous vein

REZUMAT

Obiective. Scopul studiului este de a evalua incidența recidivei la nivelul coapsei, la 5 ani de urmărire a pacienților la care s-a practicat crossectomia selectivă, respectiv crossectomia totală a venei safene interne și pe de altă parte de a evalua importanța afluenților la nivelul jonctiunii safeno-femorale.

Istoric. Tehnica chirurgicală clasică a sistemului venos superficial a fost permanent îmbunătățită, încât tehnica tradițională de crossectomie radicală (Babcock, 1907) a fost treptat înlocuită cu procedeul selectiv, executat fie pe cale tradițională, fie pe cale endovasculară.

Metodă. Studiul este unul prospectiv, fiind luați în considerare un număr de 300 pacienți (220 - femei, 80 - bărbați, vârsta medie 54 ani, cu valori extreme 25-77 ani), clasificare CEAP 2 - S/3 Ep As(2/3) Pr, operați între ianuarie 2002 - decembrie 2006 și care au fost împărțiți în două grupe: 150 cu crossectomie radicală și 150 cu crossectomie selectivă.

Toți pacienții au fost operați de către același chirurg, în chirurgie de o zi, cu anestezie locală. La toți pacienții s-a efectuat examinare clinică venoasă și examinare doppler la intervale diferite postoperator (5 ani pentru pacienții operați în 2002 și 1 an la cei operați în 2006)

Rezultate. Pe cei 300 pacienți operați s-a constatat 1 recidivă (0,6%) în grupul cu crossectomie radicală și 14 recidive (9,3%) în grupul cu crossectomie selectivă.

Concluzii. Bazat pe experiența a 300 de cazuri am observat că păstrarea tributarelor de la nivelul peretelui abdominal reprezintă o terapie eficientă din punct de vedere al prognosticului, comparativ cu rata de recidivă de peste 9% la 5 ani, în cazul crossectomiei radicale.

Cuvinte cheie: crossectomie, chirurgie venoasă, vena safenă internă.

THE OPERATIVE THERAPY OF FRESH PELVIC AND LEG VEIN THROMBOSIS AT CHILDREN WITH THROMBOPHILIA

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ABSTRACT

Thromboembolic complications in children are rare. But even in new-borns as well as in adolescents we know about life threatening situations in connection with hereditarily defects in the coagulation system which lead to hyper coagulation. In the per operative course, in posttraumatic situation and in connection with first ordination of oral contraceptives thrombophilia will play an increasable important role also in children and younger people.

If one of the well known humeral risk factors was diagnosed primary or secondary medical prophylaxis is necessary and familiarly examinations has to be done. The child as well as his parents have to be tested for the most important and most frequent parameters in order to reach the goal to lower the risk in case of dangerous exposition, which can be up to 8 times higher in heterozygous then in healthy population.

In case of fresh established venous thrombosis we can choose between Heparins, lyses regimes and operative venous thrombectomy for therapy.

We report our results of 6 children between 9 and 17 years of age we operated upon because of severe thromboembolic complications caused by various expositions (hormonal contraception, bilateral leg fracture, bed rest because of general infection) in connection with APC resistance followed a factor V Leiden defect.

Key words: Prevention of thromboembolic events, Thrombophilia, Factor V defect, APC resistance, Venous thrombectomy

REZUMAT

Complicațiile tromboembolice la copii sunt rare. Atât la nou-născuți cât și la adolescenți există condiții favorizante care în asociere cu defecte ereditare ale sistemului de coagulare pot determina stări de hipercoagulare. În perioada peroperatorie, în situații posttraumatice sau în asocierea cu anticoncepționalele orale, trombofilia are un rol principal la copii și adolescenți.

Dacă este prezent riscul humeral sau dacă este necesară profilaxia secundară, atunci se impune un istoric familial. Atât copilul cât și părinții trebuie testați pentru cei mai importanți și pentru cei mai frecvenți parametrii cu scopul de a reduce riscul de expunere care este de 8 ori mai ridicat la heterozigoți comparativ cu populația sănătoasă.

În cazul unei tromboze venoase recente se poate alege între un tratament litic cu heparină sau o trombectomie venoasă pe cale chirurgicală.

Rezultatele studiului nostru se bazează pe un număr de 6 cazuri cu vârste între 9 și 17 ani, operate cu diagnosticul de trombembolie severă de diferite cauze: contraceptive hormonale, fracturi bilaterale ale membrilor, imobilizare prelungită la pat datorită septicemiei și care s-au asociat cu rezistență la APC ca urmare a defectului factorului V Leiden.

Cuvinte cheie: profilaxia tromboemboliei, trombofilie, defect factor V, trombectomie venoasă.

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ROLE OF TCPO₂ IN THE DETERMINATION OF THE OPTIMUM LEVEL OF AMPUTATION IN PATIENTS WITH CRITICAL LIMB ISCHEMIA

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ABSTRACT

Introduction. Atherosclerotic critical limb ischemia, mainly characterized by the presence of rest pain and trophic disorders, is a major health problem in terms of diagnosis, treatment, and especially prognosis of the patient. In order to establish the optimum level of amputation and to diminish the high rate of re-amputations, we propose the routine use of the TCPO₂ measurement.

Material and method. In the period March-December 2008, 62 patients admitted to the Surgical Clinic II Cluj-Napoca with the diagnosis of critical ischemia underwent surgery. There were 50 male patients (80.6%) and 12 female patients (19.4%), and the mean age was 66.7 years. 22 patients (35.5%) had TCPO₂ evaluation.

Results. There were 31 (50%) primary amputations, 19 cases (30.6%) of re-amputations, 10 surgical revascularizations (16.1%) and in 2 other cases (3.2%) revascularization interventions failed, without requiring ablative interventions. For patients in whom TCPO₂ was measured, secondary amputation was needed in one case (4.5% compared to 45% in patients without TCPO₂ evaluation). Discussion: Results were interpreted considering as normal values TCPO₂ = 64+/-10 mm Hg. TCPO₂ < 30 mm Hg suggests ischemia and the impossibility of healing. The predictability of the test regarding the amputation level or the healing of a wound is 95.5%. The sensitivity and the specificity of this method are considered significantly higher than the ankle-brachial index, especially in the case of diabetic patients. **Conclusions.** The evaluation of transcutaneous oxygen pressure is a reliable method for the determination of local metabolism, with a higher sensitivity and specificity compared to other methods, with the highest accuracy for the determination of the optimum level of amputation in irreversible ischemic lesions of the lower limbs.

Key words: critical limb ischemia, amputation, trans cutaneous oxygen pressure, chronic occlusive arterial disease

REZUMAT

Introducere. Ischemia critică aterosclerotică a membrilor inferioare, caracterizată în principal prin prezența durerilor de repaus și a tulburărilor trofice constituie o problemă majoră de sănătate prin prisma diagnosticului, tratamentului și mai ales al prognosticului pacientului.

Pentru a stabili nivelul optim de amputație și a diminua astfel rata ridicată a amputațiilor iterative, propunem utilizarea de rutină a măsurării TCPO₂.

Material și metodă. În perioada martie-decembrie 2008, 62 de pacienți internați în Clinica Chirurgie II Cluj-Napoca cu diagnosticul de ischemie critică au fost supuși intervențiilor chirurgicale. 50 de pacienți au fost de sex masculin (80,6%) și 12 de sex feminin (19,4%), iar vârsta medie a fost de 66,7 ani. 22 de pacienți (35,5%) au beneficiat de evaluarea TCPO₂. Rezultate: au fost realizate 31 amputații primare (50%), în 19 cazuri (30,6%) s-a efectuat amputația iterativă, 10 revascularizări chirurgicale (16,1%) și alte 2 cazuri (3,2%) intervențiile de revascularizare au eșuat, fără a necesita însă intervenții ablative. Pentru pacienții la care a fost măsurată TCPO₂, amputația secundară a fost necesară într-un singur caz (4,5%, față de 45% la pacienții fără evaluarea TCPO₂).

Discuții. Interpretarea rezultatelor s-a făcut considerând drept valori normale TCPO₂ = 64+/-10 mmHg. TCPO₂ < 30 mm Hg sugerează ischemie și imposibilitatea vindecării. TCPO₂ < 20 mm Hg nu se va obține vindecarea. TCPO₂ > 40 mm Hg vindecarea este probabilă. Predictibilitatea testului cu privire la nivelul de amputație sau asupra vindecării unei plăgi este de 95,5%. Sensibilitatea și specificitatea acestei metode sunt considerate semnificativ mai mari decât indicii de gleznă-braț, mai ales în cazul pacienților diabetici.

Concluzii. Evaluarea presiunii transcutanate a oxigenului constituie o metodă fiabilă de determinare a metabolismului local, cu o sensibilitate și specificitate superioare altor metode, cu cea mai mare acuratețe pentru determinarea nivelului optim de amputație în leziunile ischemice ireversibile ale membrilor inferioare.

Cuvinte cheie: ischemie critică, amputație, presiune transcutanată a oxigenului, arteriopatie cronică obliterantă

THE PSYCHO-SOCIAL REINSERTION OF AMPUTEES

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ABSTRACT

Between 1995 and 2007, 1832 patients with obliterating chronic arteriopathy of the lower limbs were hospitalized at the First Surgical Clinic, where they underwent surgery.

Amputees experience family and social reintegration problems. Most of the patients who were amputated because of an arterial gangrene are elderly, and their other extremity is usually affected as well, which makes it difficult for them to use prostheses. The over-employment of the limb that was not amputated will aggravate its ischemia, which is why most of the patients prefer the pendular walk or the use of a wheelchair in order to move about. They do not reintegrate into the work environment, and so the family plays an important role in their recovery. Young patients, with posttraumatic or tromboangiitis-related amputations require complex reintegration, process in which society must also play a role. To a large extent, the quality of their lives depends on their ability to perambulate, on employment, as well as on an adequate social and family environment. They require professional (i.e. work-) reorientation and counseling in order to be able to lead a quasi-normal life.

Conclusions:

- 1 The social integration of amputees depends on the extent of the amputation
- 2 Their full readaptation depends on their physical status, with the psychological aspect also playing an important role
- 3 We believe that the associations specializing in this field do not get sufficiently involved in the reintegration process of these patients

VERTEBRAL ARTERY DISSECTION LEADING TO TORTICOLIS

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ABSTRACT

Vertebral artery dissection is defined by the blood penetration inside the arterial wall usually having a preexistent hematoma that splits the parietal layers. Artery dissection is recognized as being the main cause for stroke in young individuals. The dissections may be characterized as spontaneous if no factor seems to have provoked it or there is only a weak trauma involved. The result is an occlusion, a stenosis or an aneurismal dilatation of the vessel. Clinical data usually note headache, local pain and Claude-Bernard-Horner sign often followed by cerebral ischemia and retinal ischemia few days later. The diagnosis may be certified by non-invasive measurements as ultrasonography, tomography computer and magnetic resonance imaging. The treatment is done by administration anticoagulants for 3 to 6 months followed by anti-platelet medication after the vessel cicatrization. Surgical or endovascular treatment is exceptional in both acute phase or later.

Key words: vertebral artery dissection, cerebral stroke, cervico-brachial neuralgia

REZUMAT

Disecția arterei vertebrale se definește ca și pătrunderea sângelui în interiorul peretelui arterial asociat cu prezența un hematom ce disecă straturile arteriale. Disecția arterială este recunoscută ca fiind cauza principală de accident vascular cerebral ischemic la pacienții tineri. Disecțiile arteriale pot fi spontane dacă nici un factor nu pare să le fi provocat sau dacă este doar o traumă minoră implicată sau pot fi secundare unor cauze bine cunoscute. Rezultatul disecției este o ocluzie, o stenoză sau o dilatare aneurismală a vasului. Datele clinice notează cefalee, durere locală și deseori semnul lui Claude-Bernard-Horner, urmat de ischemia cerebrală și retiniană câteva zile mai târziu. Diagnosticul poate fi stabilit prin ecografie Doppler vasculară, tomografie computerizată sau angi-rezonanță magnetică nucleară cerebrală. Tratamentul se face cu anticoagulante pentru o perioadă de 3-6 luni, urmat după cicatrizarea vasului de medicație antiplachetară. Tratamentul chirurgical sau endovascular este rar folosit atât în faza acută cât și mai târziu.

Cuvinte cheie: disecție de arteră vertebrală, accident vascular cerebral, nevralgie cervico-brahială.

ANATOMIC VARIANTS OF CYSTIC ARTERY AND THEIR IMPLICATIONS DURING THE LAPAROSCOPIC CHOLECYSTECTOMY FOR ACUTE CHOLECYSTITIS

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ABSTRACT

The manner of distribution and the trajectory of the cystic artery play an important role during the laparoscopic cholecystectomy.

The laparoscopic cholecystectomy for acute cholecystitis represents a useful and safe surgical technique, which by its good results has become the golden standard along with the accumulation of surgical teams experience.

The cystic artery irrigates the gallbladder and has usually the origin on the right branch of hepatic artery.

In the literature there are described numerous variants of origin, number and trajectory respectively variants of cystic artery distribution, a review is presented in this paper.

We achieved a retrospective study on 269 laparoscopic cholecystectomies performed for acute cholecystitis in Second Surgical Clinic Cluj-Napoca between 1994 and 2007. We studied the presence and the type of anatomic variants of the cystic artery as well as the surgical technique performed.

The most favorable operative time for acute cholecystitis is between 48-72 hours from its debut when the pericholecystic adhesences aren't consolidated.

In 8 cases (3%) we found anatomic variants of the cystic artery.

Among them in 6 cases retrograde laparoscopic cholecystectomy was done and 2 cases required the conversion because of the bleeding, adhesences and of the important inflammatory process.

Good knowledge of the anatomic variants of the cystic artery is very important during the laparoscopic cholecystectomy because the unrecognition of the artery generates its lesions and intraoperative bleedings.

For the laparoscopic surgeon, accidental bleedings leads often to the conversion. The attempts of the surgeon to achieve the haemostasis can give rise to iatrogenous lesions of the bile ducts and of the environs organs.

Key words: Cystic artery, anatomic variants, laparoscopic cholecystectomy, acute cholecystitis.

REZUMAT

Modul de distribuție și traiectul arterei cistice dețin un rol major în cadrul colecistectomiei laparoscopice.

Colecistectomia laparoscopică pentru colecistita acută reprezintă o tehnică chirurgicală utilă și sigură, care prin rezultatele ei bune s-a impus ca metodă de elecție odată cu acumularea experienței echipelor chirurgicale.

Artera cistică vascularizează colecistul și are originea, obișnuit, în ramura dreaptă a arterei hepatice.

În literatura de specialitate sunt descrise numeroase variante de origine, variante de număr, variante ale traiectului respectiv variante ale distribuției arterei cistice, prezentate în lucrarea de față.

Am efectuat un studiu retrospectiv pe un lot de 269 colecistectomii laparoscopice efectuate pentru colecistită acută, în Clinica Chirurgie II Cluj-Napoca în perioada 1994

– 2007. Am studiat existența și tipul variantelor anatomice ale arterei cistice precum și tehnica chirurgicală practică.

Momentul operator optim pentru colecistita acută este cuprins între 48-72 ore de la debut când pericolectistita nu a ajuns încă să se consolideze.

În 8 cazuri (3%) s-au întâlnit variante anatomice ale arterei cistice.

Între acestea la 6 cazuri s-a practicat colecistectomie retrogradă laparoscopică iar 2 cazuri au necesitat conversia datorită hemoragiei, sindromului aderențial și procesului inflamator important.

Cunoașterea variantelor anatomice ale arterei cistice este foarte importantă în cursul colecistectomiei laparoscopice deoarece nerecunoașterea arterei duce la lezarea ei și la hemoragii intraoperatorii.

Pentru chirurgul laparoscopist, accidentul hemoragic determină adeseori conversia. Încercările operatorului de a realiza hemostaza pot provoca leziuni iatrogene ale căilor biliare sau ale organelor din vecinătate.

Cuvinte cheie: Artera cistică, variante anatomice, colecistectomia laparoscopică, colecistita acută.

**ATHEROSCLEROSIS – BASIC CONSIDERATIONS AND
MOLECULAR MECHANISMS INVOLVED IN THE INITIATION AND
PROGRESSION OF ENDOTHELIAL LESIONS**

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ABSTRACT

A multifactor entity, atherosclerosis represents the most common cause of death in the last 15 years, and epidemiological studies indicate a growth in its prevalence. The growth of the prevalence of atherosclerosis, which leads to a genuine global epidemic, and its association with an ever-growing risk of the morbidity and mortality rates, render this entity a genuine public health priority.

In our study atherosclerosis has proved to be the result of a chronic inflammatory process which, in turn, is a response to advanced endothelial lesions.

Key words: atherosclerosis, endothelial dysfunction, vascular inflammation.

REZUMAT

Entitate multifactorială, ateroscleroza reprezintă cea mai comună cauză de deces a ultimilor 15 ani, iar studii epidemiologice indică o creștere a prevalenței sale. Creșterea prevalenței aterosclerozei, care conduce la o veritabilă epidemie mondială și asocierea sa cu un risc din ce în ce mai ridicat al morbidității și mortalității, fac din această entitate o veritabilă prioritate a sănătății publice și justifică.

În studiul nostru ateroscleroza s-a dovedit a fi rezultatul unui proces inflamator cronic care, la rândul său este răspunsul la leziunile endoteliale avansate.

Cuvinte cheie: ateroscleroza, disfuncție endotelială, inflamație vasculară.

PHYSIOPATHOLOGY OF PHANTOM PAIN IN AMPUTATIONS FOR CRITICAL LIMB ISCHEMIA

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ABSTRACT

Phantom limb pain can be defined as a neurological condition in which patient with amputation has a sensation perception in missing limb or limb segment. It can be explained as a reorganization at the somatosensitive cortex in the months or years following an amputation.

Frequency of occurrence varies according to the cited studies, between 55 and 88%, higher incidence being reported as the amputation level is more proximal. Pain onset is usually a few days after operation but there are cases with pain starting at several years postoperatively.

Pain perception varies from patient to patient, evol ving from cramps to lancinant type.

Transmission pathways of pain are very complex and involves 3 levels: peripheral, spinal and supraspinal with cortex projection in different cortical areas.

Key words: phantom pain, perception, sensation, neurological pathways.

REZUMAT

Durerea fantomă se poate defini ca fiind o condiție neurologică în care pacientul cu amputație percepe senzații de la membrul sau segmentul de membru absent. Ea poate fi explicată prin reorganizarea cortexului somatosenzitiv în lunile sau anii ce urmează unei amputații.

Frecvența apariției este apreciată în funcție de studiile citate între 55% și 88%, incidența fiind cu atât mai mare cu cât nivelul de amputație este situat mai proximal. Debutul durerii este de obicei la câteva zile postoperator, dar se poate declanșa și la câteva luni sau ani de la momentul amputației.

Percepția durerii este variabilă la fiecare pacient. Poate evolua de la simpla senzație de crampă până la durere intensă, sfâșietoare.

Căile de transmitere ale durerii fantomă sunt complexe și sunt dispuse pe trei nivele: periferic, spinal și supraspinal.

Cuvinte cheie: durere fantomă, percepții, senzații, căi neurologice.

IMMERSIVE VIRTUAL REALITY ROLE IN REHABILITATION OF AMPUTEE PATIENTS FOR CRITICAL LIMB ISCHEMIA

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ABSTRACT

Patient-oriented outcome end points, such as health-related quality of life and functional status, are essential in defining optimal treatment options in amputee patients for critical limb ischemia with PLP. Research has shown incidence rates as high as 85% with PLP sufficiently severe to require withdrawal from social or work environments for considerable periods of time. PLP can be considered one of the most distressing consequences of amputation. Rehabilitation of these patients is among the largest sector of healthcare costs, therefore new clinical approaches to both improve the efficacy of physical and cognitive rehabilitation and reduce the total cost is needed. This survey describes the design and implementation of a case study based investigation using immersive virtual reality as a treatment for phantom limb pain. Dr. Craig D. Murray and his team from the University of Manchester started a pilot study to evaluate the efficacy of using immersive virtual reality (IVR) to treat phantom limb pain. This work builds upon prior research using a mirror box (in which the amputee sees a mirror image of their remaining anatomical limb in the phenomenal space of their amputated limb) to induce vivid sensations of movement originating from the muscles and joints of their phantom limb and to relieve pain. The IVR system involves the transposition of movements made by amputees' anatomical limb into movements of a virtual limb which is presented in the phenomenal space of their phantom limb. This study offers qualitative data which provide tentative support for the use of this system for phantom pain relief. We argue that the findings of this work make a case for proof of principle for this approach in phantom pain treatment. Randomized controlled trials with a larger sample size would be crucial to assess the efficacy of this system in treating phantom limb pain.

Key words: amputee, immersive virtual reality (IVR), mirror-box, phantom limb pain (PLP) , critical limb ischemia

REZUMAT

Sanatatea ce asigura calitatea vietii si statusul functional sunt esentiale in definirea unei terapii optime a pacientilor cu ischemie critica a membrelor inferioare, ce prezinta dureri in membrul fantoma. Cercetarile au demonstrat o incidenta de aproximativ 85% a durerii in membrul fantoma suficient de severe pentru a necesita retragere din medii sociale sau de munca pentru perioade de timp considerabile. Durerea in membrul fantoma poate fi considerata una dintre cele mai dureroase consecintele ale amputatiei. Reabilitarea acestor pacienti reprezinta una dintre cele mai costisitoare sectoare sustinute de serviciul de sanatate publica generand o nevoie imediata de abordari clinice noi atat pentru a imbunatati eficacitatea reabilitarii fizice si psihice cat si pentru a reduce costul total al unui astfel de tratament. Rezumatul descrie sintetic proiectarea si punerea in aplicare a unui studiu ce se foloseste de realitatea virtuala imersiva in terapia durerii fantoma. Dr. D. Craig Murray si echipa lui de la Universitatea din Manchester au inceput un studiu pilot pentru a evalua eficacitatea utilizarii terapiei prin realitate virtuala imersiva (IVR) pentru a trata durerea fantoma. Acest studiu se bazeaza pe cercetari anterioare, ce folosesc caseta oglinda (in care amputatul vede o imagine in oglinda a membrului anatomic prezent in spatiul virtual al membrului fantoma) pentru a induce senzatii vii de miscare la nivelul muschilor si articulatiilor si pentru a diminua durerea. Sistemul IVR presupune transpozitia miscarilor efectuate de catre membrul intact anatomic in miscari ale unui membru virtual localizat in spatiul membrului fantoma. Participantii au folosit sistemul IVR saptamanal, pe o perioada de 2,5 luni. Pentru ca esantionul nu era reprezentativ (n = 5), obiectivul primar a fost efectuarea unei analize calitative a datelor din chestionarele pe care participantii le-au completat pe parcursul studiului. Toti participantii au raportat senzati de miscare la nivelul membrului fantoma si o scadere a intensitatii durerii, pe parcursul a cel puțin uneia din sedinte. Rezultatele acestor teste, din punct de vedere calitativ, oferau un argument demn de luat in seama pentru utilizarea acestei terapii in durerea in membru fantoma. Studii controlate, randomizate, pe un esantion mai mare ar fi cruciale pentru a evalua eficacitatea acestui sistem de tratare a durerii la nivelul membrelor fantoma.

Cuvinte cheie: amputati, realitate virtuala imersiva (IVR), caseta oglinda, durere in membru fantoma, ischemie critica a membrelor inferioare



MANAGEMENTUL PACIENTULUI AMPUTAT PENTRU ISCHEMIE CRITICĂ

Simpozion organizat în cadrul proiectului de cercetare:

„Elaborarea unor noi metode de prevenție și intervenționale pentru ischemia critică din ateroscleroza membrelor inferioare” (EPICA – PN2 - Parteneriate, 2007–2010),

**de către Clinica Chirurgie II,
cu ocazia Zilelor Universității de Medicină și Farmacie “Iuliu Hațieganu”
3 Decembrie 2008**

Rezumatul lucrărilor prezentate

MANAGEMENT OF PATIENT WITH AMPUTATION FOR CRITICAL ISCHEMIA

Symposium organized as part of research project:

„Elaboration of new methods of prevention and intervention for atherosclerotic critical ischemia of lower limbs” (EPICA – PN2 - Partnerships, 2007–2010),

**by the Second Surgical Clinic,
on the Days of University of Medicine and Pharmacy “Iuliu Hațieganu”, Cluj-Napoca
3rd, December, 2008**

THE PLACE OF AMPUTATION IN CRITICAL LIMB ISCHEMIA

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The patients with critical limb ischemia present disseminated arterial atherosclerotic lesions; the muscular and/or cutaneous tissue ischemia is permanent threatening the limb's viability.

The surgical therapeutic attitude consists in the revascularization for limb saving or amputation with vital purpose in case the revascularization is contraindicated.

The criteria for choosing the amputation level are clinical and paraclinical between which we mention the role that TCPO₂ examination has in the establishment of the curable amputation level.

The minor amputations have a reduced risk of morbi-mortality, therefore reduced functional effects in statics and walking. The major amputations have an important risk of morbi-mortality and important functional effects.

The cost-efficiency report of the surgical treatment is marked by high costs in patients with reinterventions for complications after revascularization, as well as in those with iterative amputations; so the aggressive attitude of reinterventions is justified on an individual but not on an economical level.

The concept of technical feasibility of revascularization in critical limb ischemia is not a correct criteria for the operator decision.

The decision for revascularization or primary amputation is based on what is the best for the patient.

A primary amputation is preferred to a revascularization with minimal chance to succeed and negligible benefits in life quality.

THE EXPERIENCE OF THE SECOND SURGICAL CLINIC IN LOWER LIMB AMPUTATION FOR CRITICAL ISCHEMIA

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Vascular disease is the main cause of lower limb amputation, being responsible for almost 90% of cases in general population and 95% of amputations performed in persons over 65 in age. Main interests of amputation level is to preserve a long enough stump to permit a good mobilization of the patient. To determine the optimum level for amputation is important because every reintervention rises de perioperative morbidity and mortality.

In choosing the amputation level are involved clinical, para-clinical and intraoperative criteria. Based on clinical signs, we have to take in account local factors such as: gangrene, infection, amputation level are noninvasive: peripheral pressure and ankle-brachial index, toe pressure and toe-brachial index, pletysmography, unidimensional Doppler examination, transcutaneous partial oxygen pressure (TCPO₂), Doppler ultrasound. On the other hand are invasive methods: intravascular ultrasound (IVUS), conventional or digital subtraction arteriography, computed tomography and nuclear magnetic resonance. Associated with those clinical and paraclinical criteria, some intraoperative aspects may give to the surgeon some important indications about the level of amputation to be performed: hemorrhage at the site of muscular section, macroscopic aspect of the muscles, presence of a serohemoragic fluid, sign of an ischemic edema.

IMAGING STRATEGY FOR THERAPEUTIC DECISION-MAKING IN CHRONIC CRITICAL LIMB ISCHEMIA

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Diagnosis of chronic critical limb ischemia (CCLI) is at first clinic and based on the measurement of distal arterial pressures, using continuous Doppler (at the level of posterior or anterior tibial arteries, for non-diabetic patients-pts, or at toe's level, for diabetic or renal insufficiency pts). Pts with CCLI should be considered for an arterial revascularization, whenever possible. Arterial imaging commonly include arterial ultrasonography (abdominal aorta and lower limbs arteries) and arterial angiography. Before performing arterial ultrasonography, these patients should be clinically evaluated, by a clinician trained in angiology/vascular medicine, in order to identify poliarterial and cardiac(coronary) involvement. Patients with carotid or other arterial bruits should be investigated by ultrasonography not only on peripheral arteries, but also on cervical arteries or other arteries. Ultrasonography, ideally performed by the same angiologist as the

one who performed clinical evaluation, will provide data on the topography of arterial stenosis, on their severity, on the arterial status of potential distal sites for by-pass, as well as precious information on the arterial wall at the level of the presumed site for arterial puncture, during angiography. When meticulously performed, ultrasonography offers, compared to angiography, a high concordance rate, 90% for femoral and popliteal sites and 75-80% for iliac sites. Angiography will be systematically performed, in order to produce reference imaging, with medico-legal value, even in the rare 20% of pts in whom ultrasound identifies a high, single iliac lesion, with a good femoral site for distal anastomosis of a by-pass. Angiography is superior to ultrasonography in pts with multiple site arterial lesions (2/3 of the pts), as well as in pts with distal (calf) arterial lesions. In some of these pts, visualization at ultrasonography of Doppler flow in distal arteries justifies a delayed imaging acquisition at angiography or the use of digital subtraction. In our experience, it is justified to systematically perform lower limbs artery ultrasonography before

angiography, even if this procedure is time-consuming. In 5-10% of the pts, single-plane angiography cannot conclude on the true topography or severity of a lesion or may be misleading concerning the suitability of an artery for distal by-pass. Ultrasonography may again help, if repeated after angiography and corroborated with its results, in these pts. At the time of abdominal aorta and lower limbs arteriography, coronary angiography should be also performed in pts with antecedents of myocardial infarction, angina pectoris or myocardial ischemia (at rest or inducible, in those with an Eagle score >2, at higher surgical risk). Since CCLI pts are often poliarterial, their evaluation should be performed in an angiology and cardiology environment, with non-invasive and invasive facilities. Microcirculation evaluation, using capillaroscopy or TcpO₂ measurement is of value in pts with limited availability for revascularization, in whom amputation is considered and amputation level has to be decided. Other imaging modalities, such as angio-MRI, may represent an alternative to angiography, but only if performed on last-generation equipment, with excellent software and by trained operators. Synthesis of clinical, non-invasive and invasive imaging results is to be made by the angiologist and discussed with the vascular surgeon, together with whom the treatment strategy is decided. After revascularization by PTA or by-pass, ultrasound imaging is the first choice for treatment efficacy evaluation.

THE AMPUTATION OF THE INFERIOR LIMB FROM NEOLITHIC ERA TO NOWADAYS

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The inferior limb amputation is one of the oldest surgical procedures. Amputation, as surgical procedure dates from prehistoric times. In Neolithic Era there were people who survived to traumatic amputations, rather ritualistic or punitive than the rapeutic ones.

The main risks of the amputations effectuated in far off historical times were haemorrhage, shock and infection.

The first detailed narratives on amputations fundament the principle of removing the extremity with gangrene at a level with healthy tissue and sectioning the bone at a shorter level than the rest of the tissues.

After perfecting the diverse amputation techniques, the discussions were made in connection with the establishment of the amputation level. When we choose the amputation level we, always have the tendency to preserve a bigger length of the amputee stump, which is desired to be functional as well.

The refinement of the surgical techniques, as haemostasis, anaesthesia, the improvement of the post-op care, have occurred, but unfortunately less technical improvements have occurred. The original surgical principles substantiated by Hypocrates are applicable in nowadays also.

The amputation, constituting one of the most outstanding emotionally and traumatising events that a patient can suffer during his life, must represent a link between the totality of the treatment for limb or even life saving and the following treatments.

THE IMPORTANCE OF OXIDATIVE STRESS AND NITRIC OXIDE BALANCE IN CRITICAL LIMB ISCHEMIA

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Critical limb ischemia is associated with endothelial dysfunction as well as excess oxidative stress. A balance of oxidative stress and nitric oxide play an important role in the development of atherosclerosis in patients with peripheral arterial diseases. Oxidative stress can result from either an excess in oxidant production, or a depletion of antioxidant defenses. Reactive oxygen species cause direct cellular injury by oxidative injury to cellular proteins and nucleic acids, and by inducing lipid peroxidation, which leads to the destruction of the cell membrane. ROS also play a role as second messengers in the intracellular signaling pathways of inflammatory cells.

ROS play an important role in the pathogeny of ischemia/reperfusion tissue destruction. SRO plays an important role in pathogenesis of ischemia/reperfusion and anoxia/reoxygenation produced destruction. Their generation and plasmatic levels as well as the balance between pro and antioxidant mechanisms may lead or not to oxidative stress.

Nitric oxide (NO) have an important role in angiogenesis, but also play a protective role against ischemia/reperfusion lesions. Nitric oxide, generated by the vascular endothelium, helps to regulate vascular homeostasis. Endothelial integrity and function are implicated in

generating adequate NO bioactivity and thereby preventing ROS production and fatty streak formation.

In conclusion, in peripheral arterial disease patients there is an imbalance between oxidative stress and NO, which may be responsible for reduced flow mediated vasodilatation.

APPLICATION OF LASER DOPPLER MEASUREMENT IN EVALUATION OF MICROCIRCULATION IN CRITICAL LIMB ISCHEMIA

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Laser doppler is a real time measurement of perfusion at microcirculation level and which is expressed in arbitrary units called Blood Perfusion Units (BPU). Function principles of laser doppler is based on an emitting laser beam with a wavelength of 780nm and detection of shifted light on moving particles. Advantages of the method are: rapid response at minimal modifications of microperfusion, minimally invasive with minimum trauma of the tissues, due to the use of small electrodes; wide applications in experimental and clinical research. Also the method has some limits: very sensitive to movements (of the tissues and of the fiber light), great variability of values in different measurement points, difficult interpretation of curves, calibration of the device. Calibration is important for: instrument stability; evaluate the response to microcirculation changes; correlation between measured values and real perfusion; relationship between different devices.

Some of the clinical applications of the method are: in critical limb ischemia for: evaluation of endothelial dysfunction, quantification of wound healing and results of revascularisation, correct determination of amputation level (in association with TcPO₂, skin perfusion pressure and ankle brachial index measurement); evaluation of viability of tissues; dermatology; plastic and reconstructive surgery, neurosurgery; gastroenterology; anesthesiology; pharmacology.

THE MEASUREMENT OF THE TRANSCUTANEOUS PRESSURE OF OXYGEN (TCPO₂) FOR THE ASSESSMENT OF THE AMPUTATION LEVEL IN PATIENTS WITH CRITICAL LIMB ISCHEMIA

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Critical ischemia of the lower limbs (CLI), as a result of a progressive evolution of arterial atherosclerotic lesions, recognizes a mortality ranging up to 20% at 1 year, 70% at 5 years and 95% at 10 years, conferring to this pathology an unfavorable prognosis, similar to malignant diseases. Among survivors, a consistent part passed through laborious, painful and expensive reconstructive interventions or suffers of different degrees of handicap following amputations.

In the last 20 years, amputation rates for CLI remained relatively stable, with a slight decrease in 7th and 8th decades of life and a slight increase in the 5th and 6th decades, the percentage of patients wearing prosthesis after amputation being practically unchanged.

The criteria required in the assessment of the amputation level are clinic – preoperative (presence of gangrene or ulcerations, presence/extension of infection, perilesional tissue status, degree of pain) and intraoperative (bleeding at cutting level, macroscopic aspect of the muscle masses, section aspect of the blood vessels) and paraclinic – preoperative (ABI, TBI, segmental pressures, intradermic isotope for blood flow, cutaneous perfusion pressure, skin fluorescence, laser-Doppler, transcutaneous pressure of the oxygen, Duplex ultrasound, arteriography, CT and angio-CT, MRI and angio-MRI) and intraoperative (intravascular ultrasound, peroperative angiography).

Transcutaneous pressure of the oxygen reflects the metabolic status of the tissues and depends on the: cutaneous blood supply, tissular metabolic activity, oxyhemoglobin dissociation, tissular diffusion of the oxygen). Criteria required for TCPO₂ measurement include intermittent claudication under 50 m, rest pain, distal tissue loss or damage and diabetes mellitus. The results are not affected by arterial medial calcification, thereby the test is mainly indicated in the assessment of the vascular status for diabetic patients.

The method's advantages consist in: noninvasive, painless, allows the vascular evaluation of diabetic patients where ABI is not relevant, having 95-98% sensitivity and 98-100% specificity. Being extremely laborious and requiring equipments and consumables relatively expensive are the counterpoints.

The measurement of TCPO₂ represents the most accurate and reliable method in the assessment of the amputation level for patients with irreversible lesions in critical limb ischemia.

CRITICAL ISCHEMIA OF UPPER EXTREMITY

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Although many pioneering contributions to vascular surgery came from experiences with the upper extremity, currently less than 5 per cent of all peripheral vascular procedures are done for chronic arterial insufficiency of the arm. Consequently, there have been few large series from which to draw meaningful conclusions regarding management. Symptomatic lesions in the upper extremity are relatively unusual. Occlusions are often an incidental finding on physical or arteriographic examination. Several reasons for this are rich collateral network, small muscle mass, and ease of adaptation of activity of the upper extremity. Invasively treatable lesions from the aortic arch to the wrist are covered in the discussions in two groups. The vertebral artery is the watershed, with group I lesions proximal and group II lesions distal to it.

The choice of invasive therapy must be based on the severity of symptoms, location, and patient risk factors. The few innominate or subclavian obstructions that are symptomatic, produce neurologic and extremity symptoms that are easily reversed by an extrathoracic surgical approach. Balloon angioplasty is seeing some utility for this problem also. Concomitant carotid disease may be more significant in that its correction may not only prevent stroke but also mitigate symptoms of subclavian steal. The reconstruction of lesions distal to the vertebral artery frequently results in dramatic and durable improvement. Sympathectomy has a valuable role to play in those cases in which restoration of perfusion cannot be complete.

IMMERSIVE VIRTUAL REALITY ROLE IN REHABILITATION OF AMPUTEE PATIENTS FOR CRITICAL LIMB ISCHEMIA

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Patient-oriented outcome end points, such as health-related quality of life and functional status, are essential in defining optimal treatment options in amputee patients for critical limb ischemia with PLP. Research has shown incidence rates as high as 85% with PLP sufficiently severe to require withdrawal from social or work environments for considerable periods of time. PLP can be considered one of the most distressing consequences of amputation. Rehabilitation of these patients is among the largest sector of healthcare costs, therefore new clinical approaches to both improve the efficacy of physical and cognitive rehabilitation and reduce the total cost is needed. This survey describes the design and implementation of a case study based investigation using immersive virtual reality as a treatment for phantom limb pain. Dr. Craig D. Murray and his team from the University of Manchester started a pilot study to evaluate the efficacy of using immersive virtual reality (IVR) to treat phantom limb pain. This work builds upon prior research using a mirror box (in which the amputee sees a mirror image of their remaining anatomical limb in the phenomenal space of their amputated limb) to induce vivid sensations of movement originating from the muscles and joints of their phantom limb and to relieve pain. The IVR system involves the transposition of movements made by amputees' anatomical limb into movements of a virtual limb which is presented in the phenomenal space of their phantom limb. Participants used the IVR system on a weekly basis over a 2.5 month period. Because of the small sample size ($n = 5$), the primary focus here is on a qualitative analysis of interview data with each participant throughout the study. All participants reported the transferal of sensations into the muscles and joints of the phantom limb and a decrease in phantom pain during at least one of the session. This study offers qualitative data which provide tentative support for the use of this system for phantom pain relief. We argue that the findings of this work make a case for proof of principle for this approach in phantom pain treatment. Randomized controlled trials with a larger sample size would be crucial to assess the efficacy of this system in treating phantom limb pain.

PSYCHOLOGICAL ASSISTANCE IN SURGICAL INTERVENTIONS. THEORETICAL, METHODOLOGICAL AND PRACTICAL CONSIDERATIONS

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The surgical interventions are associated with post-surgical side effects (Nelson et al., 1988) like pain, nausea or fatigue. These side effects can lead to a longer recuperation period, to a delayed hospital releasing, to unanticipated hospitalization or additional medication. The post-surgical distress is associated with negative side effects during the surgery and during the postsurgical period. The goal of this paper is to synthesize the role of psychological assistance (evaluation and intervention) in the surgical interventions, with regard to efficacy, mechanisms of change and cost-effectiveness.

STRESS IN PATIENTS WITH AMPUTATION: IMPLICATIONS FOR INTERVENTION

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One of the critical psychological aspects of surgical procedures refers to presurgery distress and postsurgery pain and distress. Pain is a multifactorial phenomenon: the disease or procedure itself, treatments associated with these, and the associated psychological mechanisms. The aim of this study was to identify psychological mechanisms involved in generating dysfunctional consequences (e.g. anxiety, depression, severe pain) before and after surgery for amputee patients. The study comprised 76 patients with a mean age of 64. Results show that anxiety (state and trait) and depression, measured on multiple levels (emotions, behaviors, cognitions, psychophysiological symptoms) are positively associated with hopelessness and negatively with optimism which is considered, in the literature, a protective factor. Also, results indicate that negative emotions are positively associated with specific cognitive distortions (e.g. irrational beliefs, hopelessness) and negatively with optimism. Considering these results, implications for a psychological intervention, before and after surgery, for these patients are discussed.

AORTO – DEEP FEMORAL BYPASS FOR CRITICAL LIMB ISCHEMIA

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The study focuses on surgical solutions for critical limb ischemia by iliacal or aorto-iliacal thrombosis in patients with previously occluded superficial femoral artery, in the presence of a patent deep femoral artery with good collateral circulation and popliteal reperfusion.

It has been proven before that distal perfusion pressure can be raised in such cases by iliacal PTA+stenting only, if the lesion was suitable for endovascular treatment. Most of those patients went well after endovascular treatment only, not requiring any other vascular management, although few of them had a femoropopliteal bypass after iliacal PTA+stenting.

There is no clear evidence yet regarding patients without indication for endovascular treatment, who should have an aorto(iliacal)-femoral or aorto(iliacal)-femoro-popliteal bypass. Question is to prove whether it is really necessary to perform revascularization of the popliteal artery in those cases (prolonging the graft from femoral to popliteal artery), or the aorto(iliacal)-deep femoral artery bypass would be enough to ensure acceptable perfusion of lower limb.

Selection criteria included patients operated between 2004 and 2006 with critical limb ischemia by iliacal or aorto-iliacal thrombosis, with previously occluded superficial femoral artery, in the presence of a patent deep femoral artery with good collateral circulation and popliteal reperfusion, with or without distal lesions. All patients underwent surgical procedure consisting of prosthetic aorto(iliacal)-deep femoral artery or aorto(iliacal)femoro-popliteal bypass.

65 aorto- or ilio-femoral (popliteal) reconstructions have been carried out in the mentioned time interval but only 19 could be included in this study because of precise exclusion criteria. There have been 10 cases (group A) with aorto(iliacal)-femoropopliteal bypass and 9 (group B) with aorto(iliacal)-deep femoral artery bypass.

Duplex ultrasound and angiography was performed in each case. Measured parameters were ankle pressure index (numeric value) and the presence of clinical signs of critical ischemia (logical value) before and after surgery in each patient at particular time intervals. Follow-up was carried out for two years after surgery.

Preoperative mean ankle pressure index was 0,45 in group A and 0,39 in group B without any significant difference (homogenous group).

Values in group A increased significantly compared to group B immediately after surgery, but after two months, even though higher values in group A, there was no statistical significant difference between the two groups.

Two years after surgery, complications arising were more frequently in group A lead to lower pressure index values in this group. No significant statistical difference was found.

Critical ischemia was preoperatively present in all cases. Group A patients had no remnant ischemia immediately after surgery while group B still had such signs in 2 cases for a few weeks after surgery (statistically significant difference). After one month we didn't find any sign of ischemia in both groups, but after two years we noted recurrence of critical ischemia in 2 cases of group A and only 1 case of group B. General cardiovascular and respiratory complications were comparable in both groups but local complications were significantly higher in group A.

Immediate curative response is clearly higher in cases where revascularization went down to the popliteal artery. After two months those results seem to equal each other. Although no statistical significant results, it seems that complications arising in group A (thrombosis, sepsis) lead to worse long term results than in cases with revascularization of deep femoral artery only (group B).

Prolongation of bypass down to the popliteal artery can lead to more complications than revascularization of profunda femoris only. Results two months after surgery are the same if good collateral circulation is present.

For long term, collateral circulation seems to be better stimulated by a higher blood pressure at its proximal end than at both ends. Low development of the collateral circulation can lead to recurrence of critical ischemia if graft thrombosis occurs later on the thigh segment. On the contrary, if revascularization is focused on the profunda femoris only, collateral vessels develop in time and no sudden accident can be found later.

VASCULAR SURGERY ON EXPERIENCE ANIMALS

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Postgraduate vascular surgery courses on experience animals, as in our case the pig, allow to perform vascular surgery techniques by resident surgeons, especially on aorta abdominalis and iliac arteries. Our study followed from the surgical point of view the enforcement of Dacron graft at 6 experience animals during a postgraduate course attended by resident surgeons.

The study was performed on 6 pigs with 50-60 Kg weight, under i.m. and i.v. anaesthesia with Ketamin and Xylazin, achieving surgical techniques on aorta abdominalis and iliac arteries. Those procedures consist of patch with Dacron prosthesis, interposition of Dacron graft with end to end anastomosis, aorto-aortic and aorto-iliac bypass with Dacron graft with end to side anastomosis. Anticoagulant therapy with heparin was used only during the surgical intervention. Later, were taken histological samples from the aorta abdominalis, grafts and anastomosis looking for the changes occurred.

The intraoperative results were good, with the achieving of the vascular surgical techniques suggested and with all animals survival. The postoperative evolution was also good. Histological examinations revealed the quality of the anastomosis, the percent of vascular prosthesis endothelialization, the inflammatory reaction of foreign body developed around them at 2 and 3 months postoperative, respectively the presence of the thrombus into the graft in failure cases.

Postgraduate courses on experience animals proved to be a good support for vascular surgical techniques exercise by resident surgeons. Those came to complete the first vascular sutures postgraduate course performed on vascular biological samples from animals and represent a track for the aorto-iliac laparoscopic surgery which will be developed in our future postgraduate courses.

The intra and postoperative good results show the right accomplishment of vascular surgical techniques which correlated with the histological examinations prove the Dacron grafts tolerance by experience animals.