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Spitalul Clinic  
de Recuperare  
Cluj-Napoca

# **XI<sup>TH</sup> NATIONAL CONGRESS OF THE ROMANIAN SOCIETY FOR RECONSTRUCTIVE MICROSURGERY**

AND

# **X<sup>TH</sup> NATIONAL CONGRESS OF THE ROMANIAN SOCIETY FOR SURGERY OF THE HAND**

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## THE INFLUENCE OF DIABETES MELLITUS ON SURVIVAL OF ABDOMINAL PERFORATOR FLAPS: AN EXPERIMENTAL STUDY IN RATS WITH SLOWLY INDUCED DIABETES MELLITUS

BOGDAN IONUȚ BÂLDEA<sup>1</sup>, SEPTIMIU TOADER, PAVEL ORBAL, SIMONA BÂRSAN, RADU OLARIU, DAN OVIDIU GRIGORESCU, ANDRAS LASZLO NAGY, MARIUS PENCIU, ALEXANDRU VALENTIN GEORGESCU

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**Background.** Lower limb ulcers are a major source of morbidity and mortality in diabetic patients. Surgical coverage of these wounds is fraught with a high complication rate. Although clinically perforator flaps lead to good results in diabetic patients, there is little experimental data to support this finding.

**Material and Methods.** A total of 60 Wistar rats were randomly assigned either to the diabetic (n = 30) or control (n = 30) group. Diabetes was induced by streptozotocin i.p. injection at 50 mg/kg body weight and was confirmed by blood glucose levels > 180 mg/dL preoperatively. In all rats, a cranial epigastric artery perforator flap was raised. At postoperative day 7, all flaps were raised, photographed by digital planimetry, and analyzed histologically.

**Results.** Mean glycemic levels preoperatively were  $207.8 \pm 16$  in the diabetic group and  $82.8 \pm 5.1$  in the control group ( $p < 0.05$ ). Ninety percent of the flaps survived completely in the control group, compared with 66.7% in the diabetic group ( $p < 0.05$ ). The mean flap survival area was lower in the diabetic group ( $83.3 \pm 16.5\%$ ) than in the control group ( $96 \pm 4\%$ ). There were significantly more perioperative complications in the diabetic group (46.7%) than in the control group (16.7%), but these did not affect flap survival. Superficial ulceration appeared only in the diabetic group as a complication.

**Conclusion.** Perforator flaps can be successfully used for coverage of cutaneous defects in a rat diabetic model. These flaps show higher complication rates in diabetic versus nondiabetic animals; however, this complication rate has little influence on flap survival.

**Keywords:** streptozotocin, rat, diabetes mellitus, perforator, flap

## THE TREATMENT OF INFECTED DEFECTS WITH V.A.C. THERAPY

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**Objectives.** To evaluate the safety and efficiency of the V.A.C. therapy, the implementation of the therapy with negative pressure in everyday life in medical facilities with surgical specialization as well as informing specialists with therapeutic background.

To investigate the effects of materials' components used in the therapy with negative pressure with respect to their cellular morphology, viability and cellular proliferation.

To estimate and compare the utilization of resources and the economic direct costs of treatment with V.A.C. therapy in patients with acute and comic pre and postsurgical wounds.

**Materials and methods.** The V.A.C. therapeutic technique in the treatment of traumatic wounds: V.A.C. in the first 48 hours, then pause at 2 minutes, 5 minutes aspiration, for the rest of the therapy pressure at -125 mmHg. At 48-72 hours the dressing is changed, frequent finishing changes can be necessary in overly infected wounds.

In the treatment of diabetic ulcer: V.A.C. continues for the first 48 hours, then pause at 2 minutes, 5 minutes aspiration, for the rest of the therapy, pressure at -50, -125 mmHg. At 48-72 hours the dressing is changed, but not less than 3 times a week if the wounds are overly infected.

In the treatment of trophic ulcer: continuous V.A.C. for the first 48 hours, then pause at 2 minutes, 5 minutes aspiration, for the rest of the therapy pressure at -125 mmHg. At 48-72 hours the dressing is changed, but not less than 3 times a week if the wounds are infected.

In the treatment of pressure sores: continuous V.A.C. for the first 48 hours, then pause at 2 minutes, 5 minutes aspiration, for the rest of the therapy pressure at -125 mmHg. At 48-72 hours the dressing is changed, but not less than 3 times a week if the wounds are infected.

In the treatment of surgical wounds: continuous V.A.C. for the first 48 hours, then pause at 2 minutes, 5 minutes aspiration, for the rest of the therapy pressure at -125 mmHg. At 48-72 hours the dressing is changed, but not less than 3 times a week if the wounds are infected.

In the treatment of skin grafting: continuous V.A.C. at pressure of -75, -125 mmHg, with dressing changes at every 4 to 5 days.

**Results and discussion.** In therapy V.A.C. leads to a greater reducing of the wounded area, leads to a greater rate of wound closures, presets a surface of faster liquidation, and reduces the rate of secondary amputations.

**Conclusions.** V.A.C. therapy is one of the safe methods of preparing pre and postsurgical wounds, of caring as well as treating some acute and comic wounds.

**Keywords:** *negative pressure, V.A.C. therapy, plagues treatment, presurgical wounds, postsurgical wounds, acute and comic wounds.*



## WHY DO PERFORATOR FLAPS FAIL? – CASE PRESENTATION

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**Aim.** We report two case presentations of a failed radial artery perforator flap, alongside a successful peroneal artery perforator flap, in order to establish possible common causes of perforator flap failure.

**Material and method.** The first case is a 81 years old patient with a SCC of the dorsal hand, a radial artery perforator flap was dissected and kept in place, due to his venous congestion in transposition, the flap failed. What were the causes? The next case is a 51 years old patient with a defect on the lateral aspect of the leg, a large peroneal perforator flap was dissected and also maintained in place, translated after 5 days with positive outcome.

**Results.** The comparison between the two can identify possible causes for flap failure, such as aggressive dissection and handling, flap width at the entrance of the perforator, distance between perforator and defect, need for a supercharging method.

**Conclusions.** These observations can lead to a safer flap dissection, better knowledge and training

**Keywords:** perforator, fail, radial artery, learning.

## RECONSTRUCTIVE PLASTY OF THE HEAD AND NECK DEFECTS WITH FREE VASCULARIZED FLAPS BY MICROSURGICAL ANASTOMOSES

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The treatment of extensive injuries to the head and neck is a rather challenging objective for the surgeon. New techniques of plastic and reconstructive surgery in many cases failed to improve the flap survival, but diminished the postoperative morbidity and increased the quality of life. The free vascularized flaps in many cases are the most optimal methods for posttumoral and posttraumatic defects reconstruction.

In Republican Center of Microsurgery 18 patients were operated using the method of microsurgical tissue autotransplantation, 13 men and 5 women, aged from 20 up 68 years. For the head and neck defects plasty were used the following microsurgical autotransplants: radial flap (15), latissimus dorsi in combination with anterior serratus muscle (1), omentum (1) and a portion of small intestine for esophageal defect reconstruction (1).

The etiology was traumatic in 14 cases, posttumoral in 3 cases and postburn esophageal stricture - 1. The reconstructed anatomical regions were the scalp in 15 cases, the intraoral cavity in 2 cases and postburn esophageal stricture - 1.

The free microsurgical transfer has a larger reconstruction application in posttumoral and posttraumatic head and neck defects. This type of reconstruction allows having an esthetic and functional recovery in the same surgical stage, as well as a quick social reintegration and confidence, in this way the postoperative quality of life improving.

The analysis was based on the surgical techniques selection and the free flaps survival rate, as well as on the morphofunctional quality of reconstruction. Considering a good result of reconstruction the amelioration of quality of life and the low morbidity in these patients, the free vascularized flaps are the first selection technique for the head and neck defect reconstruction when the size and localization of the defect prevents the use of local flaps.



## SENSIBILITY DISORDERS OF THE FINGERS IN DUPUYTREN DISEASE

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Between 2010 – 2014 we treated 85 patients (75 men and 10 women) with Dupuytren Disease. We observed that in advanced stages (4,5,6) of the disease they presented sensibility disorders (tactile, thermal, pain sensitivity) in 62% of cases. Most of these patients had their medical history related to high alcohol consumption or to other diseases (diabetes). Their age was between 48 and 80. The last two phalanges were the ones commonly affected. Between the palmar aponeurosis and the digital collateral neurovascular bundles there is an anatomical crossing. McFarlane described a lateral fascia of the finger that is formed from two lateral strips that continues the pretendinous band and together with fibres from ligamentum natatorium and with the spiral band incorporate the digital neurovascular bundle. In advanced stages of the disease the neurovascular bundles are compressed by fibrous masses. The associated circulatory disorders were demonstrated (Hackett) by decreasing with 3-5 Celsius degrees the temperature of the affected fingers. After surgery (partial or extensive aponeurectomy and neurolysis), using operating magnifying glasses, the digital collateral neurovascular bundles were released from the fibrotic masses. Consequently, normal sensitivity was slowly recovered over the next 6 months, with better results at younger patients. As a complementary treatment we used vitamins (B, Neuromultivita) and Diapulse.

## HYPOPHARYNGEAL AND CERVICAL ESOPHAGUS RECONSTRUCTION USING FREE TISSUE TRANSFER

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Reconstruction of hypopharyngeal and cervical esophagus has indications in both, benign and malignant lesions.

The benign lesions are represented by post caustic obstruction or stenosis and we use a free jejunal graft for the reconstruction.

The resection of malignant tumors localized in the hypopharynx or esophagus results in defects that can be reconstructed using stomach, colon or jejunum. For small defects of the hypopharynx and/or pharyngo-esophageal junction flaps or free flaps can be used. The experience of the surgeon is the most important in choosing the organ or the tissue used in reconstruction.

Trying to obtain oncological resection with tumor free margins, especially when radio and/or chemotherapy have failed, there are situations when the tumor extension requires vascular resections and reconstruction techniques. The membranous trachea can be easily damaged during the dissection especially in cervical esophagus tumors.

The decision of how to choose the tissue or the organ used in the reconstruction is influenced by the location of the tumor, the site of the incision, the extent of the defect, the anatomic disposition of the graft used, and very important, the experience of the surgical team and the hospitals facilities.

In our personal experience regarding the reconstruction of the pharyngo-esophageal region we use, for partial defects of the anterior wall of the pharynx, fasciocutaneous free flaps, free jejunal graft for circular defects of the pharynx and/or reconstruction of the cervical esophagus, and colon for the esophageal reconstruction after pharyngo-laryngo-esophagectomy. We also use free omentum transfers associated with jejunal graft for large defects in the cervical region.

## DYNAMIC FACIAL REANIMATION BY FREE GRACILIS AND CROSS-FACE – CASE REPORT

Z. CRĂINICEANU<sup>1,2</sup>, V. BLOANCĂ<sup>2</sup>, A. PESECAN<sup>2</sup>, A. TUDOSĂ<sup>2</sup>, L. GALOȘI<sup>2</sup>, T. BRATU<sup>1,2</sup>

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**Aim.** We report one case of a congenital right facial nerve paralysis and hypotrophy, 16 years old, female, where facial reanimation was performed by free reinervated gracilis after cross face sural nerve graft.

**Material and method.** The cross face sural nerve graft was monitorized by nerve conduction study and when optimal conduction was obtained, 9 months later, free reinervated gracilis was performed.

Electrostimulation started 27 days postoperatively and still goes on 9 months after surgery.

**Results.** Active contraction with efficient oral commissure movement was obtained 6 months after surgery. Postoperative minimal haematoma requiring secondary surgery delayed rehabilitation.

**Conclusions.** According with actual literature, free reinervated gracilis by cross-face remains gold standard for facial reanimation.

**Keywords:** *facial reanimation, free gracilis, cross-face.*

## FASCIAL ANTEROLATERAL FREE FLAP

Z. CRĂINICEANU<sup>1,2</sup>, V. BLOANCĂ<sup>2</sup>, M. MĂSTĂCĂNEANU<sup>3</sup>, G. PRILIPCEANU<sup>2</sup>, A. PESECAN<sup>2</sup>,  
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**Aim.** Difficult reconstruction of the dorsal aspect of the distal limb requires well vascularized thin flaps.

**Material and method.** We analyzed 9 cases of dorsal aspect of upper and lower limb reconstruction after trauma, covered by ALT flaps: 4 fascial skin grafted flaps and 5 fascio-cutaneous flaps.

**Results.** All of them were successfully transferred and function was restored. Fascio-cutaneous flaps needed secondary surgery for thinning, by liposuction.

**Conclusions.** Secondary procedures can be avoided if the wright flap type is chosen. Fascial ALT is safe and useful flap requiring minimal additional dissection and with less donor site morbidity.

**Keywords:** *fascial ALT, limb reconstruction, thin flap, perforator flap.*

## MINIMALLY INVASIVE APPROACH TO CARPAL TUNNEL SYNDROME

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**Background.** Open carpal tunnel surgery has been replaced with procedures that require reduced surgical dissection of the transverse ligament, due to possible pillar pain or scar tenderness. Endoscopic approach and the Knifelight by Stryker require long learning curve and expensive material. By using the minimally invasive approach you obtain the same results with least expenses.

**Material and method.** During 2010-2014, there were 98 carpal tunnel syndromes treated in 88 patients, with 10 of them having bilateral involvement, ages between 25- 67 years old. The procedure was done using wide-awake anesthesia, tourniquet-free, skin is incised transverse 2,5 cm in distal hand crease, the ligament is incised using a 11 blade scalpel with protection over the median nerve with a grooved probe.

**Results.** 97 surgeries were followed by relief of symptoms, 1 had a persistent CTS, due incomplete sectioning of the carpal transverse ligament, and was reoperated. There were no incidents regarding median nerve injury, but 1 case neuroalgodystrophy.

**Conclusions.** The procedure can be considered safe, efficient and an alternative to more expensive methods.

**Keywords:** *carpal tunnel syndrome, minimally invasive, pillar pain*

## MINIMALLY INVAZIVE TREATMENT OF SCAPHOID FRACTURES

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**Introduction.** Scaphoid fractures are the most common carpal fractures and the treatment options are sometimes controversial. Some of the issues that are common are those concerning the blood supply, the anatomy and clinical and radiological diagnosis.

**Objectives.** The conservative treatment is recommended only for the undisplaced or incomplete type of fractures and consists of a 3-month immobilization period involving the risks of displacement or pseudarthrosis. Internal fixation of scaphoid fractures avoids the problems associated with prolonged plaster immobilization and allows early return to daily activity of the hand with bone union in all of the cases. However the open reduction and internal fixation for scaphoid fractures have the disadvantage of a larger skin incision, a volar wrist capsulotomy in order to expose the bone and a plaster immobilization after the surgery. By percutaneous screw fixation only a stab incision on the volar or dorsal aspect of the wrist is needed.

**Material and methods.** We describe the percutaneous screw fixation of the scaphoid using the cannulated Herbert screw on a volar approach in 6 patients. The majority of the patients were high demand young patients that needed a very short recovery period. We didn't use plaster immobilization after the surgery and the patients were encouraged to start movement of the wrist as soon as possible. Thus the range of motion after union was almost the same as the contralateral wrist.

**Results.** The patients were able to return to their usual activity only six weeks after the surgery and our overall results proved that percutaneous scaphoid fixation gives rapid functional recovery.

**Conclusions.** Undisplaced scaphoid fractures are the main indication for percutaneous screw fixation, the patients could return to their main daily activities in a short period of time. Also the surgery doesn't request too many supplies and could be done with only one day of hospitalization.

**Keywords:** *hand surgery, scaphoid, percutaneous osteosynthesis.*

## EXPERIMENTAL TRAINING COURSES – THE FOUNDATION OF MICROSURGERY SKILLS

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**Introduction.** Microsurgery is used in a variety of medical fields but because of high technical expertise, it is restricted to a relatively small number of centers and surgeons.

Because of the difficulty of the technique it is required for the surgeons to have training and experience before using the microsurgery in clinical situation.

The focus of the course is on the basics of microsurgical techniques and it is addressed to surgical residents and young surgeons and offers the possibility to acquire and develop the microsurgical skills.

**Method.** Basic microsurgical skills course have been organized since 1992, with 72 hours of intensive hands-on practical sessions and 6 hours of lectures.

During the course, various microsurgical techniques are taught: microvascular termino-terminal or end to side arterial and venous anastomosis on living small animals (rats) and microneurosutures, with gradually increasing the difficulty of the suture based on decreasing the size of the vessels, the working space and the resistance of the tissues. The activity is closely supervised by the experienced instructors and a constant feedback is offered during the course.

**Results.** More than 300 surgeons in different specialties were trained in our center in the last 23 years. The microsurgical skills were assessed by the instructors during the course and by the trainee himself.

At the end of the course more de 90% of the trainees were able to perform successfully arterial and venous microsurgical anastomoses and the nerve microsutures.

**Conclusion.** Immersion in intensive experimental microsurgical techniques can develop good microsurgical skills, built the confidence and promote good microsurgical practices used in clinical situations.

**Keywords:** *Microsurgery course, training, hands-on.*

## MICROSURGICAL ORGAN TRANSPLANTATION IN SMALL ANIMALS

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Transplantation of various organs has become standard treatment in modern medicine. Despite wide acceptance, there are still a lot of unsolved problems, especially related to rejection and immunosuppressive regimens. Small animals (mice and rats) represent the best animal model for transplantation research due to important general advantages: available in large numbers, low cost, easy maintenance, very resistant, easy anesthesia, well defined experimental models. There are also specific advantages for transplantation immunology with regard to inbred strains and genetically modified (transgenic and knock-out) animals.

The presentation describes the microsurgical technique for different organ transplantation in mice and rats: kidney, liver, heart, small intestine, pancreas, multivisceral and uterus. Various technical key points and experimental and clinical application are also discussed.

**Keywords:** *organ transplantation, experimental microsurgery.*

## THE CHALLENGE OF HAND THERAPY AFTER OPEN CARPAL TUNNEL SURGERY

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**Objective.** Carpal tunnel syndrome (CTS), with a prevalence of 3-5%, is an entrapment neuropathy of the median nerve. The natural evolution of this condition can lead to a significant functional loss in hand function. For severe cases, the optimum method in CTS is open surgery combined with postoperative hand therapy.

**Methods.** We included in the study the most severe cases of CTS that were treated with open carpal tunnel surgery in our department in 2014. We had 44 patients with a sex ratio of 32 women to 12 men. The age of the patients varied between 39 and 71 years. The postoperative protocol included a 24h immobilization for 39 patients with dorsal splint. For 5 patients a 72h immobilization was required as a result of swelling. AROM/PROM training as well as tendon and nerve glide were started in the first postoperative day. The hand therapy also included scar massage and desensibilisation exercises.

**Results.** For all patients the open surgical approach was chosen, and the release of the retinaculum was performed. The two-point discrimination test revealed a return of the sensibility in 90.9% of the patients. The Jamar dynamometer test showed increased grip strength 8 weeks postoperative. The desensibilisation therapy assured a better recovery. We measured the pre and postoperative range of motion. The results demonstrated a postoperative improvement.

**Conclusion.** The best results after open carpal tunnel surgery are obtained only in association with effective hand therapy. The aim of the treatment is increased muscular power of the hand as well as better discrimination in the median nerve innervation territory.

## ELBOW DEFECTS RECONSTRUCTION WITH PROPELLER PERFORATOR FLAPS

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**Background.** Defects of tissue in elbow area are a reputable challenge in the field of plastic surgery. The procedures' difficulty consist in the abundance of important anatomical structures that pass this region as well as the elbow joint tendency to ankylosis even after brief splitting. The traditional approach in covering medium to large elbow defects is the free flap. The study wants to present a newer and more patient efficient method for this specific pathology: the propeller perforator flap.

**Materials and methods.** In the study were included 15 patients operated in our department during 2014-2015, having post traumatic or post excisional soft tissue defects in the elbow region. Propeller flaps, having a perforator pedicle originating from the recurrent ulnar and radial arteries, were harvested and then rotated to cover the defects.

**Results.** We had a 100% flap survival rate. In 5 cases, marginal or superficial necrosis occurred. For the patients with this complication, surgical debridement and skin grafting was performed. Physical therapy was started in the first postoperative day. We achieved both functional and cosmetic results.

**Conclusions.** We consider the propeller perforator flap the best alternative for covering medium to large defects in elbow region. They offer excellent functional and aesthetic results, and contrary to free flaps early physical therapy is possible.

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## THE MICROSURGICAL METHOD IN OPERATIONS ON THE GASTROINTESTINAL TRACT ORGANS: OPPORTUNITIES AND PERSPECTIVES

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**Aim.** The organs of the gastrointestinal tract (OGI) have various morphological structures that correspond to their specific function. Thus, the success of the reconstructive operations on these organs is based on the type of suture used. The aim of this study is to research the opportunities and perspectives these microsurgical techniques might offer in the surgery of OGI at different levels.

**Methods & Materials.** The microsurgical suture of the OGI was elaborated in experimental conditions on 20 dogs applying the plastic model of the extrahepatic bile duct using a pedicle flap with autonomous blood supply from the gallbladder. The non – penetrating suture was applied in single layer, with separate points, using synthetic, non – absorbable monofilaments, size 8 – 9/0, 10x optical magnification. In clinical conditions, this suture was used in the reconstruction of hypopharynx (9) and anterior wall of cervical oesophagus (9), while the precision suture, same as microsurgical one of size 6/0, under 6x magnification was applied on the gastric wall (6), duodenal stump (1), gastroenterostomosis (1), jejunum wall (1), caecum wall (7), large intestine wall (2), colosigmoanastomosis (1).

**Results.** The morphopathological investigations of the applied microsurgical suture revealed the beginning of epithelisation of this zone as soon as 24 hours after intervention, and the formation of a delicate and well - structured scar by the 7th day after operation. The dehiscence occurred in 3/9 cases of the hypopharynx and in 2/9 of cervical oesophagus, with the formation of digestive micro fistulas. All 19 precision sutures underwent per primam scaring. The oral enteral feeding was restored starting day 4 – 10 after microsurgical suture and day 1 – 3 in the rest of the cases.

**Conclusion.** The analysis of the results when applying the same type of suture using unique microsurgical techniques on each type of OGI, also taking into consideration the distinctive particularities of the postoperative evolution and duration, the medical rehabilitation expenses and the social recovery's quality of the patient, revealed the feasibility of the microsurgical method. It has a viable perspective in the surgery of GI tract as it ensures the optimal biological conditions for a superior quality of physiological regeneration in the shortest time possible.



## SAME ELEMENTS OF PATHOLOGY AND PHYSIOLOGY OF MICROSURGICAL FLAPS

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**Purpose.** At first sight, microsurgical transfer, besides the extremely rapid development of nanomedicine, seems that solves and offers solutions pertaining to the supply of tissues for the plasty and reconstruction of affected areas of the human body. In fact, the direction of this vector isn't fully elucidated and at this moment remains to be discussed the questions which appear on this subject. Thus, the purpose of this literary review is to interpret correctly the concept of changes which take place in the flap, on the basis of which, later we'll be able to establish a well understood and functional algorithm of monitoring and treatment.

**Literary review.** It has been studied 112 specialized sources that reflect the state of human tissues in some critical situations, including flaps. According to the physiology's laws, a proper function and viability of tissues is ensured by structural and biochemical homeostasis. Absolutely indispensable for carrying out cellular metabolism is the complete integrity of this mechanism – energy's synthesis and its inclusion in metabolic processes, vascularization and innervation of tissues.

An important role in the choice of the way to enhance the probability flap's survival in plastic and reconstructive interventions represents the correct interpretation of the mechanism of metabolic disorders that occur in tissues in acute ischemic conditions with the advent of the flap's vascular bed reaction. Isolation and lifting the flap from the angiosome are accompanied by transient vascular processes, and in certain conditions, by vascular irreversible situations which firstly occur in cutaneous territory that loses its functional anatomy.

However, flap's surgery is accompanied by surgical trauma, and transfer of human tissues is followed by ischemic lesions of reperfusion, which can compromise the whole outcome of the interventions. It is recognized that the lesions of reperfusion is an inflammatory process modulated by complex signaling mechanisms which eventually leads to cell death and flap's damage. Restoring blood flow is essential for the flap's survival, however, the paradox is that reperfusion produces an ischemic injury through numerous inflammatory pathways.

**Conclusion.** Thus, the metabolic processes and cell in general are included in a vicious cycle of inflammatory response, which appears as a defensive reaction and by contradictory affects the viability of transplanted tissues. Acute blockage of blood flow, without early detection and active treatment, soon is followed by systemic action in the form of polyorganic insufficiency death.

**Keywords:** *flap, homeostasis, ischemia, inflammatory process.*

## TUBERCULOUS RICE BODIES TENOSYNOVITIS OF THE FLEXOR TENDONS IN THE HAND

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**Introduction.** Extrapulmonary tuberculous involvement is a very rare pathology, however encountered more frequently in the upper limb than in the lower limb. We will present a case of tuberculous tenosynovitis in the flexor tendons of the forearm, hand and fingers of a 43 years old man.

**Material and method.** This case report describes a 43 year old man, without associated chronic pathology, presenting a painless swelling in the distal 1/3 of the right forearm, over the radiocarpal region, which appeared approximately 11 months ago and increased progressively in size, without other symptoms.

Physical examination revealed volar wrist swelling, extending across the wrist crease. The swelling was non-tender, firm in consistency, painless, poorly delimited approximately 8/6/1 cm in size and non-compressible. No sensitive or motor involvement on the médian or ulnar nerve was found. It was mobile at right angles to the plane of the wrist joint but not longitudinally. There was terminal restriction of dorsiflexion and palmarflexion of the wrist. The overlying skin was macroscopically normal.

Laboratory tests were normal except for a mild leukocytosis.

During surgery, after the skin incision, the mass appeared to be under the median nerve, which was flattened, with an enlarged perineurium, with multiple neoformation vessels. After the median nerve release, the exposed mass's aspect seemed like a multilobular tenosynovitis, encasing the flexor tendons, extending from the middle third of the forearm until the distal phalanx of the I-III fingers, under the pulleys.

When incised, the mass released a yellow, clear solution, in which a lot of yellow-orange, 5/2/2 mm grains were present. The surgery included an extensive excision of all the pathological tissues, extensive wound irrigation, active drainage and suture.

**Results.** The culture harvested from the liquid was non-pyogenic.

The grains and all the tenosynovitic tissue were sent to pathology for testing.

The pulmonary x-ray revealed no active pathology and a pneumology consult was performed.

After the surgery the local evolution was un-impressive, with no local complications, and the systemic treatment was initiated.

**Conclusions.** Although tuberculosis is an uncommon cause of tenosynovitis, the clinical presentation during the surgery enabled us to diagnose the case early and treat it aggressively and efficiently. These cases should be monitored closely for recurrences.

## UPPER LIMB TRAUMA WITH AMPUTATIONS

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**Purpose.** The interest of this study is the high frequency of injuries in the hand and forearm, modern methods of reconstruction of defects at this level, and the importance of this segments ( forearm and hand) bet on everyday life. The high addressability of the **upper limb** trauma in the Rehabilitation Hospital section Reconstructive Plastic Surgery and Microsurgery, makes interest in this segment to grow and to achieve a comprehensive treatment and rehabilitation as closer to physiological function, enabling social reintegration patient -professional as soon as possible.

**Materials and methods.** To highlight the methods and surgical techniques used and postoperative complications following **trauma** in the upper limb amputations resulting, we performed a retrospective descriptive study performed in the period 2008-2010 and includes a total of 100 patients with complex trauma at the upper limb with **amputations** who required surgical reconstruction and rehabilitation morpho- functional. Inclusion criteria for the patients in the study were determined depending on age, sex, profession, origin, personal history pathological, level at which the amputation occured and the type of mechanism which produced the lesions, lesions found during surgery, type of procedure surgical, complications occurred postoperatively secondary operations performed and toxic consumption .

**Results and conclusions.** The Clinic of Plastic Surgery and Reconstructive Microsurgery of the Rehabilitation Hospital Cluj-Napoca is the highest specialized unit in the région and the most difficult cases which exceed the competence of lower level specialized units are directed to it, so that most cases are extremely complex and require a very delicate approach .

## CHOOSING THE FLAP IN COMPLEX INJURIES OF THE HAND

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**Introduction.** Coverage of complex tissue loss in the hand after severe traumas by crushing or avulsion is very challenging. The difficulties in repairing a compromised hand are primarily related to the necessity to obtain an as good as possible functionality. That comes from performing, whenever is possible, both the reconstruction and coverage as an all-in-one procedure.

**Material and Methods.** We take into account the cases with very complex injuries involving all the structures of the hand, amputations in absence of amputated segments and complex tissue defects. In 70% of our cases we used local or regional perforator flaps, and in 30% of cases free flaps.

In case of need to cover soft tissue defects over repaired fractures, vessels, nerves and tendon lesions, we prefer to use-whenver is possible-local or regional perforator flaps; if the skin defect is to big, a free flap is preferred (ex. ALT perforator flap).

For composite skin and bone defects we use generally composite flaps including bone (serratus anterior-rib).

For amputations or devascularized segments with skin defects, a free Chinese or ALT flow-through flap is used.

For amputations of different segments, and especially of the thumb, in absence of the amputated segment/s, accompanied by skin defects, we prefer to do an all-in-one reconstruction, by covering the defect with a free flow-through-flap to revascularize one or more toe transfers for the missing fingers.

**Results.** All the hands treated by this protocol survived. The failure rate of the flaps was comparable with the one in the literature, i.e. not more than 5%. By using local/regional perforator flaps we experienced no complete necrosis, but only a transitory venous congestion (20%) followed by a superficial necrosis in only 5% of cases. We lost only 2 free flaps out of 45 (4.4%). We obtained a satisfactory functional rehabilitation of the reconstructed hand in 10% of cases, a good one in 40% of cases, and a very good one in the remaining 50%. We used the all-in-one reconstruction whenever possible and begun the kinetotherapy very early after surgery.

**Conclusions.** The use of local/regional perforator flaps has a very good indication in small and medium skin defects, only as coverage. The use of free flaps remains the gold standard in solving big composite defects.

The emergency all-in-one reconstruction and the beginning of kinetotherapy as soon as possible after surgery are the key stone of a good functional recovery.

## THE DIGITAL TRANSPOSITION ISLAND PERFORATOR FLAPS

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**Introduction.** The possibility of harvesting flaps based on digital perforators located at DIP joint was described by Koshima, for covering very distal finger defects. We will demonstrate that it is possible to harvest such flaps also more proximal.

**Material and method.** We will present the advantages of using these transposition island flaps based on perforators emerging from the digital arteries, at any level of the fingers, including the thumb.

In our service were practiced 15 transposition island perforator flaps for covering tissue defects in fingers, from which 4 were for the thumb. In 2 cases we used the perforator flap as a cross-finger flap, to cover a defect on an adjacent finger.

The transposition flaps have an oval shape, are harvested from one side of the finger, without sacrificing the digital artery. After the subfascial undermining of the flap on its entire surface and identification of the vascular pedicle represented only by the perforator, the flap can be rotated 90-180 degrees and can cover dorsal and volar finger defects. The flap's donor site is directly sutured.

**Results.** These transposition flaps had an uneventful evolution, with complete integration of the flap and good quality functional recovery. In 2 cases we registered a minute partial necrosis, which spontaneously healed.

In conclusion, we consider that the perforator island transposition flaps have the advantages of using similar tissues in reconstruction, not damaging another area, they do not require main vessels sacrifice, and the donor site can be directly closed.

## LONG-TERM RESULTS AFTER MUSCLE-RIB FLAP TRANSFER FOR RECONSTRUCTION OF COMPOSITE LIMB DEFECTS

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**Introduction.** Direct traumatic open fractures or their complications, as osteomyelitis and nonunion, represent the main etiology of bone defects in both upper and lower limb. If soft tissue defects are also present, the management of these lesions becomes more challenging. The most used flaps in these cases are the vascularized fibula osteoseptocutaneous flap, the vascularized iliac osteocutaneous flap, and the vascularized muscular-rib flap. We previously reported about the advantages and the few complications by using the muscle-rib flap, and about the advantages of all-in-one reconstruction in complex injuries of the limbs involving both bone and soft tissue defects by using these flaps.

**Materials and Methods.** The study refers to 44 patients operated for acute or sequellar traumatic composite bone and soft tissue defects in both upper and lower limb, between March 1997 and December 2007, 11 females and 33 males, with an average age of 30.5 years (range, 5 to 66 years). The upper limb was involved in 18 cases, and the lower limb in 26 cases; the etiology of the defects was an acute trauma in 15 cases, and a posttraumatic complication in 29 cases. The average length of the bone defect was 8.2 cm (range, 4 to 14 cm), and the surface of soft tissue defect ranged between 6 and 475 cm<sup>2</sup>. The flap used was the SA-R in 24 cases, the LD-R in 10 cases, and the LD-SA-R in the remaining 10 cases; from these, 38 were free flaps, and 6 pedicled flaps.

**Results.** The average follow-up in our 44 patients was 23.1 months (range, 12 to 48 months). In 95.4% of cases (42 out of 44), we had complete flap survival. In only one case we registered a superficial wound infection, which was solved conservatively.

Regarding the long term results, we registered a rate of primary bone union of 97.7% (43 out of 44 cases), with an average time of 6.6 months, shorter for bones in hand and foot-2 months, but longer for femur and tibia-7.3 months. We had a single nonunion, due to the recurrence of osteitis, which was solved after staged debridements and a fibula-pro-tibia pedicled transfer; in this case, the union was obtained only after 15 months.

**Conclusion.** The vascularized rib(s) as part of a composite flap represents a good indication especially in bone defects associated with large soft tissue defects.

## RELIABILITY OF PROPELLER PERFORATOR FLAPS IN DIABETIC ULCERS LOWER LEG

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**Introduction.** Ischemia and/or neuropathy represent the main etiology of lower leg and foot ulcers in diabetics, and especially after acute trauma or chronic mechanical stress. The reconstruction of such lesions is challenging because of the paucity of soft tissue resources in the region.

In this paper, the authors demonstrate that in patients with controlled diabetes, and having at least one patent artery and protective sensation in the affected lower leg, it is also possible to use propeller perforator flaps for reconstruction.

**Material and method.** We analyze 35 propeller perforator flaps performed in 34 diabetic patients with acute and chronic wounds involving the foot and/or lower leg admitted from 2008 to 2012: 19 based on perforators from the peroneal artery (PA), 13 from the posterior tibial artery (PTA), and 3 from the anterior tibial artery (ATA).

**Results.** A 96 percent healing rate was obtained: primarily in 28 cases, after an evolution with superficial necroses and skin grafting in 6 cases. We completely lost one flap, in which case a secondary amputation was necessary.

**Conclusion.** This study demonstrates that the use of propeller perforator flaps (PPF) can be as effective as other methods in healing ulcerations in diabetics.

**Keywords:** *diabetes; no healing wounds; lower leg; foot; propeller perforator flaps.*

## LOCAL PERFORATOR FLAPS IN LOWER LEG RECONSTRUCTION

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**Introduction.** Perforator flaps represent the latest surgical discovery in soft tissue defects coverage all over the body. These flaps were initially used as free microsurgical transfers, but it was proven that could be successfully performed as local and regional flaps.

In this paper we will try to demonstrate that the perforator flaps can be used with great results in covering selected cases of soft tissue and composite defects in the lower limb.

**Material and method.** We will present the results of 117 cases with complex tissue defects in lower limb, solved with perforator flaps based on perforators emerging from the peroneal, anterior and posterior tibial arteries.

Eighty-six flaps were used as propeller flaps, and 31 were advanced or rotated between 30° and 90°. The donor area was directly closed in 28 cases, in 15 cases skin grafted, in 74 cases skin grafted and direct sutured.

**Results.** In 93 cases the flaps were completely viable, in 21 cases we encountered a superficial flap necrosis, solved with secondary skin grafting, and 3 flaps were completely lost, needing another surgical procedure to solve the case.

**Conclusion.** The main advantages of these flaps are:

- no microsurgical sutures;
- no main vascular pedicle sacrifice;
- same surgical field for donor and recipient site;
- short period of hospitalization;
- early postoperative mobilization;
- early social and professional reintegration.

## PLANTAR FLAPS BASED ON PERFORATORS OF THE PLANTAR METATARSAL/ COMMON DIGITAL ARTERIES

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**Introduction.** Because of the unique characteristics of its integument, the affirmation “replacing like with like” becomes more than evident in the reconstruction of defects of the ultraspecialized plantar skin. We present a new useful flap in the reconstruction of skin defects in the forefoot, based on small perforator vessels originating either from the plantar metatarsal arteries or plantar common digital arteries.

**Materials and Methods.** Starting with June 2011, this flap was performed, as plantar transposition perforator flap, plantar propeller flap, or plantar propeller perforator plus flap, in seven patients with ulcers over the plantar forefoot.

During a follow-up of 7 to 17 months (mean, 9.8 months), the local evolution regarding flap integration, pain, relapse, sensitive recovery, donor site, and footwear quality was analyzed.

**Results.** We registered a 100% survival rate of the flaps, with delayed healing in only one case. The gait resumption was possible after 6 weeks in all cases.

**Conclusion.** This new flap, based on small perforator vessels from the plantar metatarsal or common digital arteries, and which provides a good, stable, and sensory recovery, seems to be a promising method in the reconstruction of plantar skin defects over the metatarsal heads.

## TOE TRANSFER IN HAND FUNCTIONAL REHABILITATION

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**Introduction.** The absence of one or more fingers reduces the hand functionality, so the main purpose has to be the reconstruction with tissues similar in structure and function.

**Material and methods.** There are some features to be considered:

1. Indications of reconstruction: congenital deficiencies, traumatic amputations, surgical amputations (tumors, other pathology).
2. Timing:
  - For congenital deficiencies - between 12-18 months of age
  - For traumatic amputations - as soon as possible
  - In tumors - in the same time with the amputation or later (depending on their type).
3. Status of the hand
4. Status of the foot
5. The choice of toe to be used depends on the finger to be reconstructed, the level of amputation, the number of amputated fingers and on the patient's option.
6. Patient consent

**Results.** The survival rate is about 95%, but in approximately 10-15% of cases some vascular problems can appear; in 5-7% of these cases the appropriate monitoring and, sometimes, the returning of the patient to the operating room can solve the problem.

The range of motion of the transplanted toe is 75-90% from the opposite site. In the first 4-6 months the transferred toe “feels” like a toe; after 8-9 months the sensibility is well restored and the transplant is assimilated. Concerning the donor site, generally no functional deficits arise.

**Conclusions.** Because the final aim of hand reconstruction is the nearly normal morphological and functional recovery, the toe(s) transfer(s) remains the method of election.



## TREATMENT OF FLEXOR TENDON INJURIES

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**Introduction.** Although the flexor tendon lesions represent less than 1% of all hand injuries, they can affect to an important degree the function of the hand. Reconstructing the continuity of fingers flexor tendons still remains one of the most challenging problems in hand surgery. This is more than true for lesions in zone II due to the complex local anatomy, demanding technique, demanding skilled and attentive postoperative rehabilitation, compliance of the patient, which all play a part in outcome.

**Discussions.** The goals of a tendon repair are the obtaining of a strong, but not too bulky suture, and by causing

minimal tendon trauma and intra-tendinous disruption of the architecture and blood supply. Many surgical techniques have been used in the attempt to reduce gap formation, to increase repair strength and to allow early postoperative mobilization. For zones III to V the technique of suture is not very demanding, anyone of the well-known methods described in literature being possible to be use successfully (Fig. 1).

Two-strand modified Kessler suture completed with a circumferential continuous suture is probably still the most common technique for zone II, because it increases enough the strength of the repair without increasing the bulk, and requires the greatest load to produce gapping. However, the presence of the knot and the maximum tension at the suture level can negatively interfere with the early rehabilitation program. We use, with some modifications, the method published by Brunelli and Monini which avoids any tension between tendon

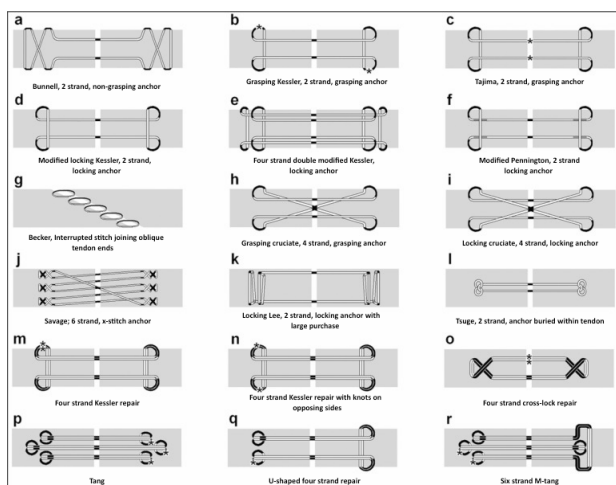


Figure 1. Different suturing techniques for flexor tendons repair.

stumps, by moving it to the distal phalanx. This technique has only two strands passing into the tendon and any knot on its surface (Fig. 2). The suture is realized with a 2-0 non-absorbable stitch pooled-out and tied-over on the finger pulp, and completed with a 4-0 absorbable circumferential running suture. The passive and active mobilization can start immediately.

**Summary.** Three main factors contribute to obtaining of good results: skilled operative technique, skilled and attentive postoperative rehabilitation, and compliance of the patient. In zone II, moving the tension from the repair site to the finger pulp allows the very early beginning of the active mobilization against resistance.

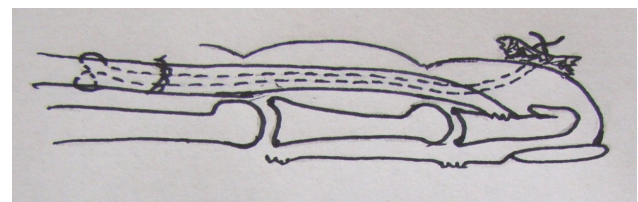


Figure 2. Modified Brunelli technique for zone II FDP repair.

## EXPERIMENTAL MODELS FOR THE STUDY OF NERVE REPAIR

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The experimental investigation of nerve regeneration after surgical nerve repair is usually carried out in rats, and not in mice, because of the larger size of peripheral nerves. Today however, the availability of a number of genetically modified mouse models makes the use of this laboratory animal very intriguing for investigating peripheral nerve regeneration at a molecular level. Based on previous experience in the rat, we have standardized an experimental model based on the microsurgical repair of mouse median nerve. The aim of this presentation is to compare the two laboratory animal models, illustrating their main features and the pros and cons of each one for peripheral nerve regeneration research.

A significant advantage of both models is that functional recovery assessment is easy to be performed because with the grasping test which is reliable in measuring voluntary motor function recovery of the finger flexor muscles. Yet, in both models, nerve fiber stereology, electron microscopy and immunohistochemistry are feasible and most commercially available axonal and glial immuno-markers are employable both in rat and mouse nerves.

The rat median nerve model is superior to the mice model because of the larger nerve size which makes surgery easier and permits molecular biology analysis of samples (mouse median nerves are so small that it is hard to extract enough RNA or proteins). On the other hand, the mouse median nerve model is superior since it opens exciting new possibilities for the study of the biological mechanisms of axonal regrowth and axo-glia relationship using transgenic colonies.

It is also important to emphasize that, in both laboratory animals, the employment of median nerve model is superior to the sciatic nerve model because of the minimal impact of surgery on animal wellbeing and because results obtained are more likely to be translated to the clinical practice as human upper limb nerves share many anatomical similes with rat forelimb nerves.

## INNOVATIVE BIO-ENGINEERED SCAFFOLDS FOR PERIPHERAL NERVE RECONSTRUCTION

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Although peripheral nerves have an intrinsic potential for spontaneously regenerating after trauma or disease, the clinical outcome in patients who suffered for a severe nerve lesion is often unsatisfactory. Recently much interest has been dedicated to the perspective of improving peripheral nerve repair and regeneration by means of tissue engineering and biomaterials and, similarly to many other fields of regenerative medicine, great expectations have risen within the general public. However, in spite of the scientific advancements, applications to the patients is still very limited and it appears that to optimize the strategy for the peripheral nerve repair in the clinical view, more basic science research is needed and neuroscientists have to strive for a new level of innovation which will bring together (in a multi-translational approach) different regenerative approaches (not only biomaterials but also cell and tissue transplantation, gene therapy and physical stimulation). In this presentation, the basic concepts of repair and regeneration of peripheral nerves are introduced. In addition, a brief overview of the today's key strategies to peripheral nerve tissue engineering is carried out in order to throw a light on the most promising future perspectives in combining the different approaches for improving posttraumatic recovery in patients. Finally, examples of successful translational research in tissue engineering of peripheral nerves are provided together with a critical discussion on some of the pitfalls which may arise in this intriguing scientific field.

## THE ROLE OF ANATOMIC STUDY FOR CREATING PERFORATOR FLAPS IN THE CALF AREA

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**Aim.** This anatomic study has the purpose to prove the existence of reliable perforator vessels arising from the arteries of the calf. Based on these perforators, cutaneous, fasciocutaneous or complex flaps can be raised to cover different types of defects of the leg or other parts of the body.

**Material and method.** An anatomic study was performed on 15 fresh cadavers, after injecting the contrast substance, Biodur S14 red, in the popliteal artery. The perforators were counted, noted their caliber, the distance from the origin from the artery to the skin and also the type of perforator (musculocutaneous or septocutaneous).

**Results.** Reliable perforators were found for each main arteries of the calf, both septocutaneous (in different intermuscular septa) and musculocutaneous, with a predictable location and caliber that can be used successfully in creating perforator flaps.

**Conclusions.** Anatomical studies of the perforator vessels in the calf region represent a powerful tool for any plastic surgeon in his attempt to solve difficult cases. Knowing their exact location and caliber, we can design reliable perforator flaps that enable us to perform complex reconstructions.

**Keywords:** *perforator flaps, anatomical study, perforator arteries, posterior tibial artery, anterior tibial artery, peroneal artery.*

## CORRELATION BETWEEN FUNCTIONAL, ELECTROPHYSIOLOGICAL AND HISTOMORPHOMETRIC PARAMETERS AFTER RAT SCIATIC NERVE REPAIR

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**Aim.** Peripheral nerve lesions have an incidence of 2-3 % of all traumas and represent a significant clinical and social problem because patients frequently require several reconstruction operations, whose effect is often non-satisfactory. The aim of this study was to determine the possible correlation between several parameters of peripheral nerve regeneration after repair of sectioned sciatic nerve in Wistar rat.

**Material and methods.** Functional, electrophysiological and histomorphometric data were obtained after transection of the rat sciatic nerve 1,2 cm proximal to its trifurcation and repaired by end-to-side and end-to-end neurorrhaphy. At 16 weeks postoperatively the sciatic functional index was determined and after that the animals were re-anesthetized to determine the nerve latency and the amplitude of the compound muscle action potential. According to the protocol the animals were sacrificed for the histomorphometric study, which evaluated the number of fibers/mm<sup>2</sup>, the mean diameter of fibers, the thickness of the myelin sheath and the macroscopic nerve changes at the level of suture. For the investigation of the possible correlations between quantitatively different variables, the Pearson correlation coefficient was used.

**Results.** A strong morphometric correlation was evidenced at the level of the distal segment between the number of fibers, their diameter and the thickness of the myelin sheath ( $r=0.842$ ,  $r=0.839$ ,  $r=0.852$ ). The greater the number of fibers, the thinner and less myelinated they were. The degree of fibrosis assessed macroscopically was not correlated with any other determination. There was no correlation between the sciatic functional index (SFI), electromyographic determinations and histomorphometric determinations, which were performed at the end of the follow up period.

**Conclusions.** The absence of correlation between functional, electrophysiological and histomorphometric methods, which is seen in cases of large fascicle nerves, show various aspects of nerve regeneration, and should be considered separately by therapeutic studies.

**Keywords:** Nerve regeneration, Sciatic Functional Index, Nerve morphometry, Rat.

## A NEW VARIANT OF “WAITING SUTURE” IN THE HAND INFECTIONS

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**Objectives.** The adequate tissue debridement as first surgical time in the hand infections don't guaranties the possibility of the wound closing by primary suture, a secondary suture after a certain delay of time being necessary. Sometimes, to avoid a second surgical procedure and a supplementary admission into the hospital, it can be done a provisional suture, called „waiting suture”, characterized by a single knot sequence of suture points. Due to the disadvantages of the classic „waiting suture” (lack of knot stability, difficulties in the management of infected wounds), a new type of „waiting suture” was designed, avoiding all those disadvantages.

**Material and method.** 31 patients in the last 12 months were subjects of this new method, which provide an absolute stability of the suture material by lateral knots and multiple possibilities to manage the wound infection by a large area for local treatment.

**Results.** The new variant of “waiting suture”, provided to all the cases as advantages: a) the wide access to the wound, both in surface and in deepness; b) an extreme mobility in a highest safety conditions (an impossible unbinding); c) the possibility to maintain it a longer period of time;

This method offers the possibility to close the wounds by a secondary suture after extremely variables periods of time, without any manipulation incidents.

**Conclusion.** This variant has evident advantages, which offer a maximal comfort in such of cases and, being, in the same time, a costless method, by avoiding the loading of the surgical schedule with a small proportions interventions, but requiring the standard preparation (as time utilized), supplemental expenses (preoperative preparations, anesthesia, aseptic materials and instruments, qualified personnel, sometimes admission in the hospital) and the patient stress related to the surgical intervention.

**Keywords:** *hand, infection, waiting suture.*

## ASSESSMENT OF STRUCTURAL AND FUNCTIONAL IMPACT OF HAND TRAUMA CAUSED BY FIRECRACKERS/FIREWORKS EXPLOSION

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**Objective.** Although hand trauma produced by firecrackers/fireworks explosion has a small incidence, their increased frequency in a very short period of time (New Year) represents a challenge for the plastic surgeon and, especially, a redoubtable public health problem related to the disabilities resulted. The study was designed to analyze the morphofunctional pathological elements of this type of injury, the available reconstruction methods in relation to the type of specific lesions and to evaluate the resources needed for the social reintegration of patients.

**Material and method.** The study, a retrospective one, analyzed 29 cases of hand traumatism admitted in the plastic surgery department caused by firecrackers/fireworks explosion in the New Year period in the years 2013-2014, 2014-2015. The type of lesions, the reconstructive methods, the post-operative evolution of the lesions and the resources used were studied.

**Results.** The data analysis shown that it was involved: a) mainly the dominant upper limb (28 out of 29 cases, among which one case with bilateral lesions); b) the thumb (in all the cases); c) the elements of the three digital pinch, usually the index and the medium; d) a concomitant damage of the soft tissues located near the traumatized digital rays (thenar and hypothenar areas, the I-st and II-nd web spaces), even if it occurred in a small number of cases 6 out of 25. Regarding the surgical procedures, it was performed in every case, as usually, the suture after debridement and at least one procedure of reconstruction with various local plasties. Distal pedicled flap were used rarely for digital and soft tissues reconstruction.

**Conclusions.** The study emphasized the continuous and progressive growth, in recent years, of the incidence of cases with traumatism caused by firecrackers explosion, worsening of cases in terms of lesions (complexity and tissue defects); this causes more and more frequent use of reconstructive procedures compared to conservative ones. Given the need of multiple interventions, the increasing incidence of post-operative complications, the length of stay in hospital and length of inability to work period, these traumatism have a negative economic impact on the public health system.

**Keywords:** *hand trauma, explosion, reconstructive procedures.*

## THE SURGICAL TREATMENT BY CORTICO-SPONGIOUS BONE GRAFT IN THE MIELOPLAXIS TUMORS OF THE HAND'S BONES

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**Objectives.** Just because the mieloplaxis tumors are quite rare in the current practice as tumoral pathology of the hand's bones, they are representing a huge challenge for the hand surgeon. Although a known algorithm for this surgical treatment is available, consisting in the replacement of the lack of bone tissue with spongiuous graft, it was reported that the late outcomes put into evidence an important resorption of the grafted tissue. Related to this low rate of graft integration, a more appropriate surgical approach must be designed.

**Material and method .** We utilized a two-step method: 1. the removal of the tumoral tissue as complete that it could be macroscopically done; 2. the reconstruction of the bone structure by bone graft, which could be: a) 100% spongiuous bone; b) cortico-spongiuous bone. We utilized the cortico-spongiuous bone graft in two cases, in order to reconstruct not only the spongiuous structure of the affected bone, but the cortical one too.

**Results.** We obtained very good structural and functional results, with 100% recovery and no tumoral recurrence after 3 years postop.

**Conclusions.** In our opinion, it is much more useful to utilize the cortico-spongiuous bone graft, because we can obtain an anatomical reconstruction of the affected bone. Another advantage is that the resorption of the spogiuous bone graft is decreased if the cortical tissue is present in the graft structure.

**Keywords:** *hand, mieloplaxis, tumors, cortico-spongiuous graft.*



## MULTIDISCIPLINARY APPROACH IN HOLISTIC CARE OF THE OROMAXILOFACIAL ONCOLOGIC PATIENT

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Oral cancer is the most commonly encountered among male individuals, especially over 40 years of age. Being ranked as the 8<sup>th</sup> most common malignant tumor, oral cavity malignancy represents 5% of the total cancer in Romania nationwide with 90% of squamous cell origin. Epidemiological studies have chartered oral floor cancer in the second position (25-30%) among the oral cavity malignancies, (close to tongue tumors) and 3% of oncologic pathology.

Alongside severe neoplastic evolution, for the majority of patients, symptoms have gradual manifestation characterized by major disabilities (disfigurement, significant speech impediment leading to social withdrawal at work, family and surroundings. Malnutrition is inbound to develop bearing in mind the gustatory function, mastication and deglutition only further enhancing the cachexic status and lowering the quality of life. Statistics bring in male smokers with/and chronic alcohol consumption, with preponderance past 45 years of age.

Proper management and referral of an Oromaxilofacial oncologic pathology should efficiently take the patient in a timely manner from the general practitioner to dentist, to oromaxilofacial surgeon and plastic surgeon, to oncologist, to social worker, to psychological support (group therapy, psychiatrist, psychologist) and to the speech therapist. However current health care remain an unfunctional chain, due to poor patient health education and indigent financial resources. Substandard level of care results in advanced stages of diseases with correspondingly complex post excisional defects. Free flaps remains the savior of post tumoral oral reconstruction providing adequate coverage of the 3D aspect of the defect.

This article presents the case of a 59-year old smoker man with a large rapidly growing squamous cell carcinoma (in evolution for about 3 months) involving the soft palate, inter-maxillary commissure, base of tongue, the posterior floor of mouth and pterigomandibular ligament on the left side with loco-regional lymphatic infiltration. Referral process initiated by his general practitioner to the dentist and finally reaching the Oromaxilofacial surgeon was a 2 years long process, with a late diagnostic biopsy and induction of adequate surgical treatment. Complementary left modified radical neck dissection along with tumor ablation was performed. The subsequent defect was compensated using a radial forearm free flap anastomosed to the facial artery and vein.

Post operative rehabilitation was problematic due to parenteral nutrition requiring percutaneous gastrostomy, tracheostomy care, social support and reintegration, post operative depression.

The article covers the thorough management of an Oromaxilofacial oncologic patient, through a multidisciplinary approach, including post operative quality of life improvement with collaboration from several health care specialists.

**Keywords:** oral cancer, radial forearm free flap, reconstruction, multidisciplinary.

## CROSS-LEG FLAP IN TIBIAL BONE DEFECTS

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**Purpose.** Identification of essential theoretical and practical issues in literature and based on own study, which aims further transfer of fibular osteocutaneous flap using cross leg method. This technique constitutes a reliable approach in the treatment of massive tibial bone and tissues defects proving the effectiveness of this plastic method and opting for this procedure in determining the positive direction of the dynamics of the patient's condition.

**Material and methods.** The vascularized fibula transfer using cross leg method in treatment of tibial bone defects was performed in 4 cases – men, aged between 22 and 43 years old, with a tibial bone defect between 10 and 24 cm, all 4 cases being associated with massive tissues defect. The method consists in performing a 2 stage surgery. Initially, first stage assumed a vertical incision on the antero-lateral side of the lower leg and 2 transverse parallel incisions to depth of deep fascia. Raising the flap in a subfascial plan, the incision was continued until the fibula with its subsequent proximal and distal sectioning. Transverse incisions were continued in subfascial plan until the postero-medial limit of the tibia, preserving posterior crural septum and integrity of perforator vessels. After muscles' separation, the flap could be transferred into the defect. Both legs were attached to an external device for a period of approximately 21 days. Later, the second stage assumed the flap's dissection from the donor area, and the grafting of the defect. The receiving fibula leg was fixed using osteosynthesis until definitive bone consolidation.

**Results and discussions.** Respecting the method's principle and the time intervals at which it acts solves the problem of tibial bone defect, of viability of bone graft and of recovery of the tissue's imperfection. However, the use of this method requires to take into account the circumstances of preoperative diagnosis. Indications for the procedure are serious vasculare lesions in the affected limb, which doesn't allow a free transfer or a microsurgical procedure. The massive bone and tissues defect also requires opting for this techniques which is just resolved by transfer of the fascio-osteo-cutaneous flap. In opposition are contraindications, especially the major ones: the fracture of donor leg, vascular damage of donator area and its involving in infectious complicated processes. The result resumes in definitive bone consolidation in a period of time between 18 and 24 months, with subsequent functional recovery of the affected limb.

**Conclusions.** The fascio-osteo-cutaneous fibular flap is a safe flap for coverage of bone and tissues defects, only in accordance with strict preset of indications and contraindications of the procedure.

## DUPUYTREN DISEASE: THERAPEUTIC OPTIONS, RESULTS AND COMPLICATIONS - A SINGLE SURGEON EXPERIENCE

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**Background.** Dupuytren’s disease predominantly affects older men of northern European descent <sup>1</sup>. It seems that there is a causal relationship between Dupuytren’s disease and manual labor, alcohol abuse, epilepsy, diabetes mellitus, carpal tunnel syndrome and smoking <sup>2</sup>. Clinical presentation of the disease usually shows bilateral involvement, one hand being more affected. Nodules are followed by cords formation. Knuckle pads and ectopic disease are often found. Functional impairment and hence surgical intervention is usually considered when there is a metacarpophalangeal contracture of at least 30 degrees or any degree of proximal interphalangeal joint contracture. Multidisciplinary treatment for Dupuytren disease can aid in optimizing the quality of care for patients with this disorder.

**Material and method.** Data were collected retrospectively for all patients undergoing surgical treatment by a single surgeon, for Dupuytren disease in our Department, over 8-year period. Variables evaluated included patient demographics, stage and grade of contracture, location, method of resection and reconstruction, complications, recurrence rates and patient outcomes.

**Results.** 34 patients (32 male and 2 female) fulfilled eligibility criteria. The median age was 42.3 years (range, 25 to 78 years). Dupuytren diathesis was observed (n=8), with bilateral involvement (n=3), ectopic lesions (n=2) and family history (n=3). The most common grades of the disease were stage II (n=22) and stage III (n=8). Involvement of the fingers was observed in one ray (n=13), two rays (n=19) and three rays or more (n=5). The most common surgical procedure was limited fasciectomy (n=21). Radical fasciectomy (n=10), dermofasciectomy (n=4) and percutaneous fasciotomy by needle (n=2) were also performed. VY plasty (n=2), Z plasty (n=21), local flaps (n=3), open palm technique (n=2) and full thickness skin grafts (n=2) were used for incision closure. Simultaneous Fasciectomy and Carpal Tunnel Release was performed (n=12). Residual proximal interphalangeal joint contractures was addressed surgically (n=4). Routine postoperative static dorsal splinting after fasciectomy was applied for 14 days. Postsurgical instructions were given always to the patients. Postsurgical exercise therapy was given for 3 to 8 weeks. Pressure garments for edema treating edema was added (n=3). Complications were observed (n=7), the most notable being Dupuytren disease recurrence (n=3) and residual contracture at the proximal interphalangeal joint (2).

**Conclusion.** Progress in understanding Dupuytren disease may warrant minimally invasive procedures, that are growing in popularity for both surgeons and patients <sup>3</sup>. Meanwhile surgical open treatment for metacarpophalangeal (30 degrees) and interphalangeal (any degree) joint contracture stands as “gold standard”. Risk of complications increased with severity of preoperative contracture. Multidisciplinary treatment guidelines for Dupuytren disease can aid in optimizing the quality of care for patients with this disorder. As it has for nearly two centuries, better treatment options for Dupuytren disease continues to be a quest that many surgeons join.

**Keywords:** *Dupuytren’s contracture, Dupuytren’s disease, Dupuytren’s diathesis.*

## RECONSTRUCTION OF SECOND AND THIRD RAY HAND AMPUTATION FOR CHONDROSARCOMA WITH DISTAL THIRD RAY FILLET FLAP: CASE REPORT

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**Background:** Hand bone tumors represent 6 percent of all bone tumors, most of them of benign behavior<sup>1</sup>. Malignant skeletal tumors of the hand tend to show a less aggressive behavior<sup>2</sup>. Hand-sparing surgery for chondrosarcoma appears to not adversely influence patient survival. Negative surgical margins and adjuvant therapy are critical and required for local control<sup>3</sup>. Functional reconstruction after wide local surgical excision or re-excisions of such tumors may represent a clinical challenge. In this paper we present a study case of malignant transformation in a long lasting enchondroma of the hand. The diagnosis and surgical treatment algorithm are discussed.

**Patient and Method:** One patient with early onset enchondroma of the second metacarpal bone was analyzed. A large skeletal tumor of the second metacarpal was observed at the presentation, extending in the surrounding tissues. The large tumor of the second ray of the dominant hand was slowly enlarging over the last two years, with mild pain and functional impairment. Dorsal and volar skin involvement was observed through adherence to the tumor. Radiographs reveal poor margination, cortical expansion, and soft-tissue extension at the third metacarpal and second ray proximal phalanx level. Positive diagnosis was obtained through incisional biopsy. Distant metastasis were ruled out. Local wide excision could be obtained only with second and third ray amputation. The resulting defect was reconstructed with a finger fillet flap from the third finger unaffected skin.

**Results:** A functional result was obtained through combined second and third ray amputation with third finger skin preservation and use for the coverage of the resulting defect. Instead of using a distant pedicled flap or a microvascular flap, we used a fillet flap from the third ray that would be otherwise excised. A follow-up of twelve months showed minor functional impairment and no local or distant signs of recurrence. No role for irradiation or chemotherapy has been prescribed by the oncologist. A yearly basis follow-up and observational schedule was planned for the rest of the lesions.

**Conclusion:** Local control of malignant bone tumors of the hand may necessitate amputation of several rays. Fillet flaps are an excellent option frequently used for this kind of defects. These are axial pattern pedicled flaps, designed from “spare parts” when transplanted tissue would otherwise be discarded. The principal advantage of this method is the maintenance of functionally important tissue and extremity length.

**Keywords:** *case report, hand chondrosarcoma, fillet flap, amputation.*

## THERAPEUTIC MANAGEMENT OF A SUBUNGUAL GLOMUS TUMOUR: CASE REPORT

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**Objective of the study.** Glomus tumours are rare vascular tumours mainly found on the fingers, usually under the nails, accounting less than 2% of the hand tumours. Even though is a benign and slow-growing tumour the subungual localisation may be very painful due to abundance of the nerves fibers. The purpose of this paper is to present the diagnosis and the therapeutic management of a subungual glomus tumour in case of a 47 year old woman, suspected with Raynaud syndrome.

**Material and methods.** We describe the case of a 47 year old female patient, previously admitted to a Rheumatology Department with features suggestive of Raynaud’s phenomenon that involve the distal phalanx of one finger, with no history of trauma. Positive diagnosis was made on clinical examination, radiographic examination and a nailfold capillaroscopy which revealed a subungual tumour. The treatment was surgical and consisted in removing the nail and excision of the tumour with minimum safe margins.

**Results.** The histopathological exam revealed a glomus tumour, completely resected. The recovery after the surgery was good with complete relief of symptoms, and there were no recurrences after 6 months.

**Conclusions.** Even though glomus tumours are very rare soft tissues tumours, differential diagnosis should be made with Raynaud syndrome especially when the symptoms involve only one finger. The treatment of glomus tumours is surgical, early diagnosis and complete excision being important in treating adequately and in preventing recurrences.

**Keywords:** *case report, glomus tumour, subungual tumour.*

## RESEARCH REGARDING THE INFLUENCE OF NON-IONIC CONTRAST MEDIUMS ULTRAVIST 300 AND ULTRAVIST 370 ON BLOOD AND URINE IN CATS

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Addressing the use of contrast agents is a major problem in cats, raising questions due to the fact that this species is sensitive to iodine, the main component of iodinated contrast agents (Odiston) of high osmolarity, which results in the loss of the animal after serious adverse reactions.

Emergence of non-ionic contrast agents with low osmolality enables their use for radiological diagnostic in cat.

This paper aims to track hematological and biochemical changes of blood and urine following administration of contrast mediums Ultravist 300 and Ultravist 370 in cats, and possible side effects that may occur.

Blood tests (hematology and biochemical), both performed before and after administration of the contrast highlighting its degree of tolerance by the body.

Laboratory tests of urine capture some oscillations in urine composition, but without affecting the operational status of urinary tract.

The study is at the beginning and the results will be applied in the human medical practice.

**Keywords:** *cat, blood, urine, Ultravist 300, Ultravist 370.*

## THE TECHNIQUE OF DENTAL RADIOGRAPHY IN DOGS

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Considering the fact that in recent years raising dogs as pet grew particularly in urban areas, benefits of attention from the owner and also from the veterinarians. Since the high protein dog's diet has changed in recent years, tending to an omnivorous diet has dragged itself pathological problems in the mouth, problems encountered also in humans, such as gingivitis and other periodontal diseases.

These pathological processes lead to tooth loss, difficulty in chewing, mechanics changes in TMJ, plus the changes after trauma to the maxillary complex.

This paper aims to present examination techniques and radiological diagnostic procedures in maxillary and dental disorders in dogs, having a useful contribution in surgical treatment applied to restore function and health of the mouth.

In this paper, we added new information in a continuously growing field of veterinary dentistry, given the outstanding progress in this field in the recent years, approaching it in many aspects to human dentistry.

The study is at the beginning and the results will be applied in the human medical practice.

**Keywords:** *dog, veterinary dentistry, radiological diagnostic.*

## NEUROLOGICAL DIAGNOSIS IN DOGS WITH EPILEPTIFORM SEIZURE

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Because of the ambiguity and complexity of symptoms, the pathophysiological mechanisms involved and the etiology, a clinical diagnosis of neurological disorders is a very difficult process. In lesions of the nervous system, complete neurological examination is imperative; it actually represents a continuation of the general physical examination. It is recommended to establish a standard procedure for examination of the animal, in order to establish an accurate neuroanatomical diagnosis. The general objectives of the neurological examination are to identify the neurological injury and to determine its location. It is important to know that finding the location does not imply finding a certain type of lesion.

The issue raised by us is one of great interest, taking into account two aspects, namely, the increasing number of dogs as pets and extremely diverse causes that can cause convulsions, causes that require a diagnostic and intervention as early as possible. The differential diagnosis of the idiopathic and symptomatic epilepsy in dog is based on several criteria: age of occurrence, clinical symptoms, interictal period, supplemented by laboratory examination result.

The study is at the beginning and the results will be applied in the human medical practice.

**Keywords:** *Dog, Epilepsy, Magnetic Resonance Imaging, Neurological examination, Seizures.*



## DUPUYTREN OF THE THUMB AND LITTLE FINGER

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**Introduction.** Dupuytren disease is a condition known from ancient times and was first described in 1831 by Baron Guillaume Dupuytren who even performed the first surgical intervention on this disease. Since then a lot of cases and studies have been mentioned in the literature. The 5<sup>th</sup> and the 4<sup>th</sup> are most frequently affected, whilst the thumb is rarely involved, being affected only in 0.5-3% of cases.

The purpose of this paper is to bring into discussion a rare case of Dupuytren affecting the thumb and the little finger of the left hand. The patient was admitted into the Department of Plastic and Reconstructive Surgery presenting two severe fiber cords on the radial side of the left thumb and volar part of the little finger.

**Materials and methods.** We present the case of a 60 years old male patient with Dupuytren disease affecting the left hand, who had no associated conditions and no family history of this illness.

The clinical examination showed that the thumb had an adduction position due to an extending fibrosis arising from the thenar eminence and going along the radial border of the first phalanx. The little finger had a vicious position, with flexion of the metacarpophalangeal and proximal interphalangeal joints. The severity of the condition had surgical indication, which was immediately performed. It consisted of total aponeurectomy, zig-zag incisions over the contracture of the fibrous elements of the 5<sup>th</sup> finger, in combination with Z-plasty because of the extensive fibrosis. For the thumb we performed a cord excision. Vital elements were identified and carefully dissected.

**Results.** The patient had a good clinical evolution and was discharged after several days. He was followed up periodically for any contracture of the opposite hand.

**Conclusions.** The involvement of the thumb is very rare, especially in our country, being most often described in north European countries.

Involvement of the thumb and little finger is technically challenging because of the fascial plane's connected with the thumb via the thenar eminence and via the hypothenar eminence for the little finger.

The association of fibrous cord in the thumb and 5<sup>th</sup> finger makes it even more rare, no clinical case was describe until now in the medical literature.

## THE ALTERNATIVE THERAPEUTIC METHOD FOR THE REPAIR OF PERIPHERAL VASCULAR DEFECTS USING TISSUE ENGINEERED VASCULAR GRAFTS

ANDREI MARIN, RUXANDRA MIHAI, SILVIU MARINESCU

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**Objective.** The study consists of the development of an alternative therapeutic method in comparison to classic vascular grafting in peripheral vascular surgery by using small size (<1cm) tissue engineered vascular grafts (TEVG).

**Material and methods.** TEVG testing will be done on experimental animals (lab rats). There will be 3 experimental lots. A comparative analysis between the vascular grafts and the TEVG used for the repair and peripheral vascular regeneration will be done. The vascular graft and the TEVG will also be compared to a witness lot.

**Results.** Achieving an arterial vessel using tissue engineering techniques is still in the development stage and long term results are unknown. Lab animal testing follow the current modern tendency in multidisciplinary research in order to obtain 100% biomimetic blood vessels, by combining basic science with innovation and clinical research.

**Conclusions.** Extensive vascular lesions represent a pathology with a major social and economical impact, requiring a prolonged hospitalization period and complex rehabilitation procedures. The success of this therapeutic method could be the foundation for improving the health of the population.

**Keywords:** *tissue engineering, vascular grafts, microsurgery.*

## HANDLING A COMPLEX CASE OF THUMB CLINODACTYLY USING ILIAC CREST AUTOGENOUS BONE GRAFTING

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**Study Objectives.** Consequences exerted on prehension make thumb malformations diseases with strong reverberations on hand functionality. Hereby we present a severe case of thumb clinodactyly solved by performing iliac bone graft osteoplasty.

**Materials and methods.** In order to prepare surgery thumb and pelvis radiographies were performed, as well as establishing preoperative graft size and degree of angulation needed for restoring distal phalanx alignment. Two incisions were performed at ulnar and dorsal aspects of the thumb to prevent extensor tendon injuries. Restoring alignment of the bone structure was achieved by inserting the bone graft at the base of the second phalanx after fracturing the cortical and underlying spongiosa. The patient required five days of hospitalization, immobilization being maintained up to four weeks after the surgical procedure.

**Results.** Following the six weeks evaluation there was significant improvement of terminal and subterminal prehension (severely affected before the surgery) and moderate increase in strength prehension intensity.

**Conclusions.** We believe that the combination of thumb reconstruction using iliac bone grafting associated with an intensive program of recovery started four weeks postoperatively (after suppressing immobilization) determines significant improvement in hand functionality by restoring the anatomic landmarks necessary for prehension. Also, in our opinion other criteria that recommend the use of this surgical technique in thumb clinodactyly are reduced hospitalization time, reduced morbidity at donor site and aesthetic considerations related to the presence of small postoperative scars.

## RECONSTRUCTION OF THE LOWER LIMB USING LOCAL AND FREE TRANSFER FLAPS IN PATIENTS WITH SOFT TISSUE, BONE AND TENDON DEFECTS OF THE LOWER THIRD OF THE LEG

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**Study Objectives.** In this paper we present different techniques of lower limb reconstruction using local and free transfer flaps in patients who have suffered trauma resulting in soft tissue defects located in the lower third of the leg.

Bone exposure and impaired dominant vascular structures are almost a rule in traumas at this level, therefore we believe that this reconstruction technique has to take into account nature of the injury and its consequences, previous medical history, as well as the patient's expectations regarding the prognosis.

**Materials and methods.** To demonstrate the importance of local and general factors that lead to a favorable outcome we present a series of cases of lower limb reconstruction by using the following: fasciocutaneous free flaps, local muscle flaps and fasciocutaneous local flaps. An important factor in choosing optimal reconstruction technique represents clinical and paraclinical examinations of the patient. For the presented cases several procedures were performed such as: Doppler ultrasound, x-rays and patients' lipid profile determination, corroborating results with general and local clinical appearance.

**Results.** Following surgery patients required an average of 14 days of hospitalization. Postoperative evolution was favorable, encumbered only by the appearance of small areas of marginal necrosis determined by risk factors related to age, patients' arterial status and preoperative defect size.

**Conclusions.** We believe that choosing the reconstructive technique should take into account the nature of the trauma and its consequences on the anatomical structures (bones and vessels), the previous medical history, paying special attention to vascular and metabolic disorders, pre-existing lesions in the donor area and the patient's expectations related to the outcome of postoperative functional and aesthetic consequences.

## PERCUTANEOUS APONEVROTOMY IN DUPUYTREN DISEASE

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**Introduction.** The Dupuytren disease is a well known pathology, with intricate pathogenesis and for which the treatment can be conservative or surgical. In this paper we will try to demonstrate that the percutaneous needle aponevrotomy is a valuable and very useful tool in selected cases.

**Material and methods.** We present a series of cases which presented to the Plastic Surgery Department of the Rehabilitation Clinical Hospital Cluj Napoca, between 2013-2015. The patients were mainly males, between 41 and 78 years old, with Dupuytren contracture in the IIIrd-Vth ray, stage II-III, uni- or bilateral, and in one case also in the first ray, in the thenar region.

The surgical procedure took place after isolation in sterile field and exsanguination with a tourniquet, under regional anesthesia (Lidocaine 1% Bier block). It was performed with an 18G, 1.2x38 mm, pink, beveled needle, for all afflicted rays.

For the bilateral disease we performed first one hand, and after 1.5-6 months the other one.

After the surgery, the hand was immobilized in a splint for 3 days in complete extension, after that the kinetotherapy program was initiated under specialist supervision, with successive dynamic splinting and then night splinting for 6 months.

**Results.** The surgery took in all cases under 30 minutes and obtained the complete extension of the afflicted rays.

We encountered no skin necrosis, no nerve or vascular complications.

In one patient the pathology relapsed at 8 months, because the patient did not follow the rehabilitation protocol.

**Conclusion.** This surgical procedure is, in our hands, easy to perform, fast and safe and can be a very good option for patients with multiple associated pathologies, for stages II-III of the disease. The great advantage is that does not imply creating an incision, which, is well known, that can be the trigger point for new the relapse of contracture.

## NEW SURGICAL TREATMENT FOR THE TRAUMATIC MALLET FINGER

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**Aim.** Mallet finger deformity is one of the most frequent pathological entities after extensor tendons injuries, which appears as result of the disruption of extensor tendon continuity over the distal interphalangeal joint. Despite the fact that a lot of methods were used in managing this deformity, the treatment of mallet finger is still a much debated subject.

**Material and method.** We'll try to demonstrate the advantages of a new surgical method by using a dorsal de-epidermised flap reinserted through the bone. The procedure starts by maintaining the DIP joint in 0 degrees of extension by using a Kirschner wire. Then we performed an intra-dermal incision that delimitates a flap on the distal 2/3 of the dorsal aspect of the second phalanx, the distal end of the flap coinciding to the DIP joint; the width of the flap is of 3-5 mm. The flap is de-epidermised and raised superficial to the tendon. At the level of extensor insertion on the distal phalanx a hole of 1-1.5 mm is done. A 4/0 steel thread is passed through the distal end of the dermo-adipose flap and is then passed through the intra-osseous hole and knotted palmarly in a tie-over manner. The extensor tendon is sutured with 4/0 absorbable threads to the flap. The skin is closed over the flap. Postoperatively we immobilize only the DIP joint. The Kirschner wire is removed after three weeks, the steel thread after four weeks and the immobilization after five weeks. After that, the DIP joint is gradually weaned from the immobilization. We used this method in 97 cases.

**Results.** The patients regain 95-100% of DIP stability and mobility, with an extension deficit of 0 to 10 degrees.

**Conclusion.** This simple and effective method avoids a prolonged and uncertain immobilization and has a significantly high percent of success. The method uses local resources and avoids the rejection phenomenon related to allograft materials. The distal trans-osseous reinsertion and centro-medular wiring are important technical adjuvant and improve the final results.

## CARPAL TUNNEL SYNDROME – CONSIDERATION ABOUT THE LATE PRESENTATION

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**Introduction.** The distal compression of the median nerve in the carpal tunnel is a common, but unfortunately under-diagnosed pathology in Romania. The study will try to demonstrate the degree of correlation between the preoperative investigations and the intra-operative findings.

**Material and methods.** We took into consideration carpal tunnel syndrome patients presented in the Plastic Surgery Department of the Rehabilitation Clinical Hospital Cluj Napoca, between the years 2013-2015. The patients were evaluated preoperatively with electrodiagnostic studies, median nerve sonography, static two point discrimination test, subjective pain evaluation questionnaire, clinical evaluation with provocation tests.

The patients were mainly elderly females, with associated pathologies (asthma, thyroid pathologies, allergies, obesity, hypertension, psychiatric pathologies, rheumatic pathologies etc).

After the surgery, the patients were immobilized for 2 days in a dorsal splint, in proclivity, then the kinetotherapy protocol begun, with 10 days Diapulse stimulation and mobilization under specialist supervision.

**Results.** In all the cases was mandatory to release the carpal tunnel from the distal 1/3 of the forearm until the mid-metacarpal area, performing epi-perineural median nerve neurolysis. The nerve was severely compressed, with macroscopic and microscopic modification of the perineurium, nerve vessels and in some cases with neuromas in continuity.

The study revealed that the symptoms were tolerated by the patients, mainly females, until very severe stages of the injury and they really can't perform their usual manual duties.

Often, the patients received conservative treatments prior to presentation in our clinic, which alleviated the symptoms for a while, but only to become more severe.

The study revealed a direct correlation between the results of the electrodiagnostic studies and the intra-operative findings.

From the clinical examination tests we found that in a large number of patients the clinical picture was intricate with the signs and symptoms of the associated pathologies.

**Conclusions.** Our study revealed that a lot of patients in Romania tolerate this pathology until the disease becomes extremely severe, from fear of surgery, due to prior conservative treatments which offer temporary alleviation of symptoms and because they can't afford to take a vacation from their usual mandatory duties.

## TONGUE RECONSTRUCTION USING VRAM FLAP AFTER STAGED NECK DISSECTION AND SUBTOTAL GLOSSECTOMY FOR SQUAMOUS CELL CARCINOMA. CASE REPORT

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**Objectives.** Tongue reconstruction uses various free flaps: radial or ulnar forearm, rectus abdominis muscle or anterolateral thigh flap among others. We present the case of a 21-years old male with squamous cell carcinoma of the anterior 2/3 of the tongue (classification IIa<sup>[1]</sup>) and right submandibular adenopathy. Patient underwent staged operations: radical modified bilateral neck dissection and VRAM flap reconstruction following the subtotal glossectomy. Particulars of the case, the advantages, specific adjunctive treatments and the medium-term outcome are shown.

**Material and methods.** The patient presented with impaired swallowing and phonation due to tongue tumor growing for two years. Tumor biopsy confirmed squamous cell carcinoma. Feeding tube and intense metabolic reanimation brought patient to adequate BMI preoperatively.

First stage: tracheostomy and bilateral modified radical neck dissection were performed. Two days later, after mandible osteotomy, two thirds of the anterior aspect of the tongue, mouth floor and associated ganglia were excised. The resulting defect was covered using free vertical rectus abdominis muscle flap (VRAM) on deep inferior epigastric pedicle anastomosed to superior thyroid artery and internal jugular branch, respectively. The muscle bulk was placed in the middle of the defect, with the three-lobed skin paddle placed outside and the lateral wings forming the sublingual folds. Mandibular osteosynthesis was performed using screws and plate. For the abdominal wall closure the components separation was used. Radiotherapy was initiated two months after the surgery and the patient underwent the full protocol.

**Results.** Histological exam confirmed tongue squamous cell carcinoma with safe resection margins. Flap survived entirely. Early oro-cervical salivary fistula was closed using sutures and tissue adhesive. The tracheostomy was closed and PEG tube remained in place for an additional for weeks until patient resumed complete oral diet, confirmed by X-ray exam. Speech is satisfactory both for patient and doctor. Wound dehiscence post-radiotherapy healed in 2 months with assisted secondary healing.

**Conclusions.** VRAM flap was successfully used in tongue reconstruction after subtotal glossectomy. The bulk needed is provided by the muscle part while the sulcus is re-created by the foldable skin flap. Minor complications were solved and one year follow-up showed normal feeding, satisfactory speech and no recurrence.

**Keywords:** *squamous cell carcinoma, neck dissection, VRAM, free flap, tongue reconstruction.*

## TRAM FLAP RECONSTRUCTION OF ANTERIOR TWO THIRDS OF THE TONGUE AND MOUTH FLOOR FOLLOWING SQUAMOUS CELL CARCINOMA EXCISION. CASE REPORT

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## PROPELLER ANTEROLATERAL THIGH FLAP FOR KNEE AND THIGH RECONSTRUCTION AFTER SARCOMA EXCISION. CASE REPORT

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Reconstruction of soft-tissue defects of the knee area has always been a challenging task to the plastic surgeon, due to the paucity of local tissues available for reconstruction. Free flaps are still the gold standard for large defects, but propeller perforator flaps are an appealing option for small and medium defects. Propeller flaps allow bringing proximal skin distally to cover average size defects that would otherwise require a free flap.

Myxofibrosarcoma (MFS) is a variant of the malignant fibrous histiocytomas, one of the most aggressive types of soft tissue neoplasms and requires large-margins excision.

**Objectives.** Herein we report the propeller anterolateral thigh perforator flap to reconstruct the knee and distal thigh soft tissue defect in a 74-years old man after surgical excision of a large myxofibrosarcoma. Technical details, particulars of the case are discussed and significant literature is reviewed.

**Materials and methods.** The 15/10 cm tumor on the left knee and distal thigh was removed with safety margins, including partial knee joint capsule. The biceps femoris muscle flap covered the articular defect and anterolateral thigh flap was designed for propeller advancement for the soft tissue defect. Advancing the dissection lateral to medial, the venous outflow became insufficient therefore distal skin paddle with fascia was left intact and the flap was rotated and advanced to cover the defect completely.

**Results.** Final pathology exam reported myxofibrosarcoma with adequate resection margins. Except for minimal marginal flap necrosis solved by secondary healing, the postop period was uneventful. The patient resumed full-range ambulation in one month and 5 month follow-up showed integrated flap with no tumor recurrence. Oncologic committee established clinical and imaging follow-up, without other treatments needed.

**Conclusions.** Pedicled anterolateral thigh propeller flap represents a satisfactory reconstructive option considering the local vascular anatomy of the region. Whenever vascularization outflow is insufficient, intact skin paddle can help in discharging the venous blood excess. The flap doesn't interfere with local and regional muscle therefore leaves the ambulation intact.



## INCREASING THE ACCURACY OF NIR FLUORESCENCE ANGIOGRAPHY IN ASSESSING FLAP VIABILITY USING AN INTRAOPERATIVE THERMAL CHALLENGE

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**Introduction.** Indocyanine green (ICG) angiography is a reliable method of predicting flap survival. It provides the surgeon real time information regarding flap vascularization and it can be used intra-operatively to guide resection of nonviable tissue prior to flap inset. However, the blood flow pattern in a flap immediately after harvest is reduced. Skin perfusion recovers gradually reaching a maximum point after 24h, thus intraoperative use of ICG angiography underestimates flap viability. We used a local skin warming procedure to increase intra-operative flap perfusion and compared the fluorescence percentages obtained to those recorded after 24 h.

**Methods.** Submental flaps were created in 8 pigs. The flaps were harvested on a single submandibular perforator. ICG angiography using the Artemis System (Quest Medical Imaging) was performed before surgery and intra-operatively, before and after flap warming at 40°C with a fan, under temperature control with a thermal camera (Testo 890 thermal camera). The flap survival was measured post-operatively at 24, 48 and 72h, clinically and with ICG angiography. A perfusion map was created for each flap, and the ICG perfusion values recorded intra-operatively, before and after flap warming and 24 h post-operatively were compared. All perfusion values were analyzed using the ImageJ processing software with a fluorescence threshold of 33%.

**Results.** ICG angiography performed at 24 h had a mean accuracy of 92%, (86% - 98%) for predicting flap necrosis. When compared with ICG perfusion values at 24h, the intra-operative ICG angiography before skin warming underestimates flap viability in all pigs with values, ranging from 7-13% of the flap surface (mean 11.5%). The intra-operative ICG angiography performed after flap warming underestimates ICG flap perfusion at 24h by only 1-2% of the flap surface (mean 1.75%).

**Conclusion.** Intra-operative ICG angiography performed after local skin warming at 40°C provides perfusion values similar to those obtained at 24h and correctly predicts flap survival at 72h. Local warming increases the accuracy of ICG angiography in predicting flap survival.

## EXPERIMENTAL ANIMAL MODEL (LAB RATS) FOR TESTING THE EFFECTS OF PERIOSTEUM STRIPPING COMPARED TO NON-STRIPPING OSTEOSYNTHESIS METHODS ON CALLUS FORMATION IN FRACTURES

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**Introduction.** The periosteum plays an important role in callus formation at the site of a bone fracture. Nowadays there are many published clinical studies that compared different methods of osteosynthesis, but very few of these studies showed how the periosteum stripping interfere with callus formation.

**Materials and methods.** We plan to use 30 Brown Norway lab rats with similar age and weight (400 g). The femur will be broken on both limbs in the same way, resulting identical fractures. After that, we will use plates and screws as an osteosynthesis method for one limb and centromedular osteosynthesis using K-wires for the other limb. The osteosynthesis material will be removed after three weeks. The lab rats will be assessed clinically on daily basis, radiological every 2 weeks, histopathological and biomechanical after the animal being euthanized (at 1 months). It will be noted the quality of the callus in terms of functional, radiological, histopathological and biomechanical aspects in both methods.

**Results.** We will make observations in order to see if the lab rats will use for support the limb that had osteosynthesis using plates and screws in two or three days after surgery, if the callus will be superior in terms histopathological aspects and also if the results of the bending test will be better for this method of osteosynthesis compared to centromedular fixation using K-wires.

**Conclusion.** We intend to demonstrate that the periosteum stripping involved in osteosynthesis using plates and screws do not influence significantly the callus formation (histopathological proof). The experimental study will be the baseline of a clinical study in which we will compare two methods of osteosynthesis in order to reduce similar metacarpal fractures, proving that the removing of periosteum do not influence significantly the callus formation in metacarpal fractures.

**Keywords:** *periosteum, callus, histopathology.*

## EXPERIMENTAL MODEL FOR LYMPHO-VEIN ANASTOMOSIS (LVA) AND LYMPH-NODE TRANSFER (LNT) IN LARGE ANIMALS (PIG) USING FLUORESCENT IMAGING AS A VALIDATION TOOL

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Lymphatic microsurgery has reemerged as one of the major topics of interest in reconstructive surgery, due to recent promising clinical results after LVA and LNT procedures. The exact mechanism by which clinical improvement can be achieved yet highly debated, due in part to the lack of a reliable, reproducible experimental model for the study of lymphatic regeneration.

**Aim.** We aimed to develop a new, easily reproducible, large animal experimental model as a tool to study lymphatic regeneration after LVA and LNT procedures.

**Materials and methods.** A lot of 10 common breed pigs (*Sus scrofa domestica*) were used to develop and standardize the surgical model of groin lymph node transfer and LVA. Fluorescent imaging was used to obtain in-vivo live lymphatic mapping of the lower and upper limbs (Hamamatsu Corp., Photo-Dynamic Eye) using indocyanine green (ICG) as fluorescent dye.

**Results.** We present the short-term results obtained with the experimental lot of 10 pigs, including surgical procedures for LVA and groin LNT. Patency rates were 80% for LVA and 100% for groin LNT. Lymphatic distribution in the healthy pig shows consistent patterns making the groin lymph node an ideal candidate for LNT. CT lymphangiograms correlate highly with the obtained lymphatic mapping.

**Conclusion.** This new experimental model bridges the gap between rodent models and clinical findings in the study of lymphatic regeneration, since it provides reliable, human-sized vessels with similar histology. Long-term follow-ups of experimental animals are in progress and will provide more data regarding lymphatic regeneration after LVA and LNT.

**Keywords:** *lymph node transfer; lympho venous anastomosis; experimental; lymphatic surgery.*

## THE MICROSURGICAL TRAINING LAB - HOW TO AN EXPRESS HIGHWAY FROM THE FIRST ANASTOMOSIS TO PERFORATOR FLAPS AND SUPRAMICROSURGERY

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The success of most reconstructive procedures still depends on microsurgical skill, producing two effects: the best reconstructive surgeons are those who are most skilled in the microsurgical technique and exposure to microsurgical procedures remains a central feature in the training of every reconstructive surgeon.

Hands-on experience remains the only way to develop this skill and despite numerous attempts to develop non-living training methods, the small and large animal models are still unmatched in terms of learning curve and received feedback.

**Aim.** Our goal is to provide evidence that a structured, modular training program in living tissue with step-by-step incremental difficulty is the most efficient method to develop microsurgical skills.

**Materials and methods.** We present the training program developed since 1998 at Pius Branzeu Center in Timisoara, Romania, which takes a surgeon from basic microsurgical training all the way to free transfer of perforator flaps and supramicrosurgery, by means of standardized training models in rats and pigs, available via basic and advanced training courses.

**Results.** Specific training models in living tissue have been developed for each module of the training program and have been refined over time through the constant feedback provided by a total of 1068 trainees. We present each model and its incremental improvements.

**Conclusion.** While technical skill plays a role in every surgical procedure, we consider that microsurgery has an important mental component, the so-called “microsurgery mindset” or “paradigm” and that successful acquisition of the microsurgical skills requires a paradigm shift, from thinking in terms of general surgery maneuvers to the microsurgery mindset, which can only be acquired by hands-on training in living tissue.

**Keywords:** *microsurgical training; flap training; perforator flap dissection; experimental; free flap harvesting.*

## OUR EXPERIENCE WITH DIGITAL TRANSFERS AND TRANSPOSITIONS BIOMECHANICS AND MOVEMENT

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**Introduction.** Rehabilitation after digital transfers and transpositions is one of the most challenging parts of hand therapy field. The full process will have to cover all aspects of hand function: **mobility, strength, sensibility and dexterity**. It is essential in this process to use the full knowledge of anatomy, physiology and biomechanics of the hand.

**Material and methods.** There is no case that will match the other, so the results may vary. The therapist must assess important aspects like age, sex, social condition, family, workplace, dominance in order to obtain maxim functional result. Coordination between surgeon, therapist and patient is very important in this process.

**Conclusion.** Early after surgery and going to 1 or 2 years in the future, the therapy of transposed and transferred fingers is the **tip of the pyramid in hand therapy**.

## “SPAGHETTI WRIST”

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**Introduction.** Lacerations to the volar wrist surface have the potential to be severely debilitating, mainly due to the superficial location and high density of tendons, nerves and arteries in that area. Laceration of multiple flexor tendons in zone V presents a special problem in management. Deep forearm lacerations proximal to the transverse carpal ligament typically involve multiple structures, including tendons, median and ulnar nerves, and the ulnar and radial arteries.

Extensive volar wrist lacerations, also known as ‘**spaghetti wrist**’, ‘**suicide wrist**’ or ‘**full-house wrist syndrome**’ has been described extensively in the current literature, although there is no standard definition as to what constitutes a spaghetti wrist.

**Material and methods.** Despite their relatively frequent occurrence in the civilian population, few data are available in the literature to classify these injuries; thus, a uniform reporting, severity of disability and prognosis are not available.

We used an active early controlled protocol starting day 3 after surgery. Different modifications were made during 1-2 weeks in order to obtain the best ratio of protecting the sutures and enhance the ROM.

**Rehabilitation of the patient with a tendon injury is a challenging process.** The repaired tendon must be simultaneously protected from rupture and moved in a controlled fashion. While measures are necessary to protect the repaired structures, early controlled motion is required to enhance healing and function. Appropriate intervention at the correct phase of healing is based on an understanding of tendon and soft tissue healing and the factors that influence repair and function.

**Results.** All Patients we followed had a good socio-professional reintegration with good function of the hand involved.

**Conclusions.** Coordination between the surgeon and the therapist is essential. Tendon injuries can profoundly affect hand function and appropriate therapy and rehabilitation are essential to preserve function to the fullest extent possible.

The minimal definition of spaghetti wrist needs to be redefined comprehensively to include lacerated structures other than volar wrist structures and the classification should include all variants, so that, functional outcome studies can be conducted and reported.

## HOW MUCH IS ENOUGH IN EARLY ACTIVE MOBILIZATION POST-FLEXOR TENDON INJURIES

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**Introduction.** Restoring digital flexion of fingers and regaining everyday function in hands has been one of the most “hard to get” objective in hand surgery and therapy. Among this, the flexor tendon injuries involving zone II is known to be extremely difficult to manage due to the complexity of the structures involved and the post repair complication that can emerge.

Across the world, the most known programs used after flexor tendon repair are Modified Klienert, Duran&Houser, Indiana, all being variation of the original Klienert protocol.

**Purpose.** The aim of this article is to describe the limit of AROM followed after Modified Brunelli Technique used to repair the injuries in zone II flexor tendon injuries. This technique decrease the tension on the tendon suture site preventing its damage and allows the early active mobilization of fingers (day II after surgery).

**Material and Methods.** We used Modified Brunelli technique to repair flexor tendon injuries in zone II followed by early active mobilization of the fingers day 2 after surgery.

The protocol involves a dorsal blocking splint with wrist in slight flexion up to 5 to 10 degrees and digits in full flexion. The pulleys are fixed dorsal on the splint with rubbers. The patient is instructed to perform 4 to 7 AROM 4 times daily under therapist supervision and 7 to 10 resistive AROM one time every 2 hours following day 2 after surgery under strict therapist supervision.

D.A.S.H questionnaire was used to determine the progress of regaining function, and the strength was measured in comparison with the uninvolved hand.

**Result.** Patients were treated using this protocol regain full function of the hand fingers. The wound healed good with no scar tissue adhesences and retractions. The D.A.S.H questionnaire score was good after 12 weeks and strength was restored in all cases 16 weeks after surgery. In few selected cases, a static-progressive extension splint is used during the night after week 12.

**Conclusion.** Even though this kind of approach is not generally encouraged and sustained, the results we have in our service show that if applied properly the outcome is good using less materials and less time until regain function.

## GIANT TENARIAN AND MEDIOPALMAR LIPOMA – RARE BENIGN TUMOR

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**Objective.** Bringing to the forefront of a benign tumor, lipoma of the hand, which represents only 5% of benign tumors of this region. Shall be defined as giant when its diameter is over 5 cm. The tumor progresses slowly being painless. Deep giant lipomas are rarest.

**Material and methods.** We studied a case of a 47 years old patient, which for about two years shows changes in the palm relief and about 6 months ago detects a marked increase in the volume of thenar eminence and the appearance of paresthesias in the first four fingers. Clinical examination revealed the presence of aelastie consistency tumor formation, painless spontaneous or on palpation across the entire palmar surface, with larger size in the thenar eminence level, exceeding 5 cm in diameter. The most relevant way to determine with certainty the local extension is MRI. Differential diagnosis is primarily made with liposarcoma. The treatment is surgical and consists in complete removal of the tumor (135g). Recurrences are very rare.

**Results.** The surgical treatment was successful, the patient is socio-professional fully reintegrated with no functional or sensory sequel.

**Conclusions.** We emphasize the rarity of the location, the tumor size, the importance of the MRI in the differential and positive diagnosis as well as the necessity of surgery to cancel the symptoms and restore normal function of the hand.

**Keywords:** *lipoma, giant tumor, hand.*



## NON-MICROSURGICAL COMBINED TECHNIQUES FOR POST-TRAUMATICALLY DEFECTS OF DISTAL PHALANX OF THE THUMB

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**Objective.** To evaluate the outcomes of the combined non-microsurgical techniques used in reconstruction of distal thumb when microsurgical techniques cannot be performed.

**Methods.** Thirty patients with distal thumb amputations, isolated or combined, in one or both hands were included. The injury mechanisms were complex, including crushing, electrocution and avulsion with no general and local conditions to perform microsurgical replantation. The aim was to preserve function, sensitivity and length. For distal thumb reconstructions, we used a modified Mantero-Bertolotti technique using a Littler heterodigital neurovascular flap instead of the O-Brien flaps in 16 patients, the Mantero-Bertolotti technique in 8 patients and Littler flap in 6 patients.

**Results.** All the flaps have survived, with no necrosis area or venous insufficiency. The results have been evaluated based on age, injury complexity, size of the flap, mobility, sensitivity, cortical reintegration of the new pulp in the thumbs cases, morbidity of the donor site, hospital stay, social and professional reintegration and patient satisfaction.

**Conclusions.** In the cases of the distal thumb amputation, when there is no condition for the microsurgical replantation, we should not forget or avoid the non microsurgical techniques that include the usage of proximity or distant flaps or the association of these techniques. Although the usage of these flaps has been more or less controversial along the years, the outcomes are good.

**Keywords:** *non-microsurgical replantation, thumb, flap.*

## DIGITAL REPLANTATION IN CHILDREN UNDER 3 YEARS OLD - A MICROSURGICAL CHALLENGE

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**Objectives.** Digital amputation in children has an absolute indication for replantation, both functional and sensorial outcomes being really good. There are some particularities and difficulties regarding the surgical technique: the osteosynthesis, the microsurgical anastomoses, the postoperative analgesia, the dressings and the recovery techniques. The purpose of the presentation is to bring forward all of the above.

**Methods and materials.** There were studied three cases of male patients aged between 2 years old and 2 years and 10 months old, who had total amputations at the level of the first phalanx of the ring finger in the first case, the index finger in the second case, and at the middle finger in the third case (at the same level in all three cases). These amputations were the result of injuries by ax. In all cases the osteosynthesis was made as less traumatic as possible, avoiding the growth cartilages. The vessels of very small dimensions, especially in the case regarding the youngest patient, needed the use of 11/0 sutures and the adequate instruments. Postoperative analgesia had an important role in preventing vasospasm and further in a successful replantation. Immobilization was made following the known principles for such young patients. The patients backgrounds and the misunderstood pathology, from the parents' point of view, made their follow up during the postoperative period very difficult.

**Results.** The results were very good in all three cases, with total functional and sensorial recovery. There was a secondary intervention needed in only one of the cases, for the reconstruction of extensor system.

**Conclusions.** Replantation in young child patient has absolute indication. Although there are many technical difficulties, the results are more than good in both functionally and sensory matters plus professional satisfaction is the highest.

**Keywords:** *replantation, child, microsurgery.*

## RECONSTRUCTION OF A COMPOSITE HAND DEFECT AFTER SELF-INFLICTED HUNTING RIFLE INJURY

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I shall report one case-a 45-year-old man- of gunshot wounds to the hand treated with a skin paddle reverse-flow forearm flap and primary bone grafting with autogenous iliac bone graft. This case were due to a self-inflicted hunting rifle injury. The wound were severe and extensive with full-thickness dorsal skin, tendon, muscle, bone, vessel and nerve losses.

**Method.** Treatment was performed in two stages with skeletal stabilization, bone grafting and extensor tendons reconstruction. The surgeries were performed within 2 days of presentation to the emergency room. This included surgical repair of their gunshot wounds, with limited debridement of only obviously necrotic, non-viable tissue. Definitive osseous reconstruction was performed in the same time after the initial debridement. K-wire was used for fracture fixation because this procedure is safe and bone shortening is not considered a problem. The dorsal skin defect was reconstructed with skin paddle reverse-flow forearm flap in the first stage, too. The second stage was performed 8 months later when extensor tendons were repaired with plantaris tendon graft.

**Results.** Postoperatively, there were no episodes of wound infection. This suggests that contamination is probably minimal and that use of primary bone grafting is relatively safe in these low-velocity injuries. The metacarpal fracture achieved primary radiographic and clinical union. Radiographic analysis revealed that fracture healed with no shortening. The functional result were very satisfactory, given the severity of the initial injuries and the functional objective was attained since there was no posttraumatic stiffness.

**Conclusion.** In addition, this technique simplifies the reconstruction by using a local flap and allows better management for healing and rehabilitation.

**Keywords:** *radial forearm flap, bone reconstruction, functional recovery, hand gunshot wound.*

## HYPOGASTRIC ABDOMINAL WALL RECONSTRUCTION WITH A PROXIMALLY PEDICLED ANTEROLATERAL THIGH FLAP AFTER RADICAL CISTECTOMY: A CASE REPORT

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The anterolateral thigh flap was described by Song et. Al. In 1984 as a septocutaneous perforator-based flap and was developed for widespread clinical applications by Koshima et. Al. In 1983. Although more usually used as a free flap, it also has versatility as a pedicled flap. There are, however, no well-established guidelines that exist to define the extent of defects that can be reconstructed using this flap.

**Method.** I present an original case of reconstruction of the hypogastric abdominal wall defect after radical cystectomy, using an anterolateral thigh flap (ALT) harvested with vascularised fascia lata sheath.

I have used this flap as my first-choice flap for this case.

A 55-year-old man presenting a full-thickness abdominal wall defect in hypogastric region of 15/8 cm was reconstructed by a pedicled ALT flap. The donor site were closed primarily.

**Result.** Postoperative, the knee was maintained in flexion, which permitted hip flexion, thus reducing tension on the pedicle. After 1 week, progressive knee extension was permitted and ambulation initiated. Skin wound healing was obtained within 14 days, with no complication. No flap necrosis developed. There was no donor site sequela.

**Conclusion.** The pedicled ALT flap appears to be a good solution for hypogastric abdominal wall defect in a one step procedure. Vascularised fascia lata bring with the cutaneous flap is usefull to reconstruct the abdominal fascia.

## EXTRAPLEXAL PROXIMAL NERVE TRANSFERS IN BRACHIAL PLEXUS PALSY

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**Objective.** The nerve transfer techniques or extraplexal neurotizations consists in sectioning a donor nerve, to connect it with the distal stump of a receptor nerve, whose function was lost during the trauma in complete brachial plexus palsy (BPP) with absence of available roots. Extraplexal nerve transfers (EPNT) are employed, such as the spinal accessory nerve (SPN), the phrenic nerve (FN), the intercostal nerves (ICN), and Oberlin’s technique to increase the amount of axons transferred to the injured plexus. In BPP with avulsion of all the roots EPTN are the only reinnervation option. The aim of this retrospective study is to evaluate the results of this procedure, in total brachial plexus .

**Material and methods.** From 75 BPP, in 19 ICNT was done (15 biceps and 4 triceps), in 6 the Oberlin technique was used, in 3 FN was used and in 5 SPN to axillary nerve was performed. Patients were reviewed at 6, 12 and 36 months after procedure. The average age of the patients was 29 years. The average time to surgery after occurrence of the injury was 6-9 months. Biceps, deltoid and triceps reinnervation arm abduction and strength of elbow flexion or extension were evaluated.

**Results.** The averaged time required for biceps reinnervation was 12 – 14 months after ICNT and 8-9 months after FNT; for triceps was 9 months after ICNT; in Oberlin technique was 4-6 months and 3-4 months after SNT to axillary nerve. After Oberlin technique there was no motor or sensory deficit related to the ulnar nerve.

After ICN transfer, 11 patients achieved M3-M4 elbow flexion according to the Medical Research Council grading system, 3 patients with M1-M2 and 2, M0. For triceps, two patients achieved M3-M4 elbow extension – to which we performed Carroll transposition for elbow flexion recovery - one M1-M2 and 1 M0. From 6 patients using Oberlin technique, 5 achieved M4 and one M3. For deltoid functional recovery all 3 patients achieved M3-M4 arm abduction after SNT to axillary nerve. In a single case the reinnervated biceps recovered at M2 –M3 after FNT (33.3%) to MCN nerve and at M0- M1 in 2 cases.

**Conclusions.** Nerve transfers are a viable option for peripheral BPP. ICNT into the nerve of MCBB for elbow flexion recovery is a reliable procedure in brachial plexus palsy. ICNT for the long head of the triceps for elbow extension restoration offers a positive alternative (Carroll transposition). Transfer of the SN to axillary nerve is the technique of choice for the reinnervation of the deltoid. Oberlin technique is simple and offers a better results in short time and is an effective and safe option.

**Keywords:** Brachial plexus palsy; nerve transfer; operative surgical procedures; upper extremity function.

## LEDDERHOSE DISEASE ASSOCIATED WITH DUPUYTREN CONTRACTURE

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**Objective.** Ledderhose disease consists of plantar aponevrosis degeneration - the establishment of the nodules on the cords which slowly retract - the equivalent of Dupuytren's disease that can be (or not) associated. The aims of this paper are that surgical treatment offers the possibility of pain relief on walking and normalization of feet pressure distribution and for the cases where painful embarrassment persists after sectorial plantar aponevrectomy, the autologous fat transfer (AFT) improves the results.

**Material and methods.** Within 11 years (2003-2014) we operated 361 patients with Dupuytren's disease of which 162 Tubiana stages I-II and 199 Tubiana stage III-IV retractions. Of the 199 patients with Dupuytren's disease in advanced stages III - IV, 25 patients (12.56%) with age between 42 -65, were found clinical signs of Ledderhose disease (in 17 patients, simple plantar nodules and in 8 patients, retraction was associated). In 16 patients nodules were palpable on both plants (64%) and in 9 cases only on one side. Ultrasound and MRI confirmed plantar fibromatosis. In 5 patients (20%) of the 25 with Ledderhose disease, painful manifestations affecting plantar support and walking imposed one foot surgery. Sectorial aponevrectomy was performed with excision of plantar nodules and retractile cords. Postoperatively, the operated leg was maintained in elevated position for the first 2 days with moderate compressive dressing and the physiotherapy was begun in the third day. A protective orthosis allowed walking with support starting on the seventh day.

**Results.** Histological examination confirmed the plantar fibromatosis in all operated cases. Walking was possible on average at 2-3 weeks postoperatively. In 3 patients the pain associated with impaired walking disappeared completely - very good result in 60% of cases operated - and in 2 patients (40%) painful embarrassment persisted 6 months from sectorial aponevrectomy. This motivated the injection of autologous fat tissue in the plantar area. Postoperative controls at 6, 12 and 18 months revealed improved walking without foreign body sensation in both plantar areas.

**Conclusion.** Surgery for Ledderhose disease must be applied only in cases of painful embarrassment that affects plantar support and walking. Better outcomes can be achieved through the implementation of new procedures as AFT - reliable, easy to apply and with a low cost compared to other modern versions of treatment (fibrinolytic agents, shockwave therapy, Marlex mesh, etc.). Using AFT in Ledderhose disease improves the results, minimize recurrence, maintains plantar architecture and reduce postoperative scar tissue volume.

**Keywords:** *Ledderhose's disease – surgical treatment, plantar autologous fat transfer. .*

## MACRODACTYLY AND CLINODACTYLY OF THE FINGERS WITH OR WITHOUT CARPAL TUNNEL SYNDROME

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**Objective.** Macroductyly is a rare malformation characterised by a disproportionate growth of one or more fingers. Rarely it is associated with clinodactyly. This paper aims to establish an algorithm in the surgical treatment of macroductyly for the rare cases in which it is associated, with clinodactyly or carpal tunnel syndrome (CTS) induced by this lipofibromatous hamartoma (LFH) of the median nerve.

**Material and methods.** We report two cases of macroductyly. The first case associated important macroductyly with clinodactyly in the index finger. In the second case with lipofibromatous hamartoma (LFH) of the median nerve who appeared hypertrophic, with a fatty infiltration which induced CTS..

The first case: a 39 years old woman with clino-macro-dactyly of left index without paresthesy in the median nerve territory. The diagnosis was paraclinic; hypertrophic bone structures were detected on X-ray. The surgical treatment consisted in shortening each phalanx (P1, P2, P3) by transverse osteotomy. In P3 a triangular osteotomy was done to correct the clinodactyly.

The fixation of the phalanx was done by two intramedullary k-wires. Then, narrowing osteotomies were performed with triangular resection. For P3 we used Foucher fixation.

The second case: 29 years old woman born with macroductyly of her left index and medius. At the age of 2 the amputation of the medius, who had an associated clinodactyly was performed. At the age of 29 the patient shows signs of CTS and the MRI examination reveals an increased, hypertrophic median nerve. Opening the carpal tunnel showed the lipofibromatous median nerve infiltration (type LFH benign). Under microscope, we dissected and removed the tumor preserving the nerve as much as possible

**Results.** In the first case, at 6 weeks postoperative, after extraction of k-wires, the patient undertook functional physiotherapy and after 3 weeks the thumb-fingers pinch was possible but the degree of active flexion of the PIP joint was reduced to 10 ° and the DIP to 5°. At 6 months the PIP joint mobility was 15 ° and 7 ° for the DIP.

In the second case, at 4 weeks postoperative resulted in the resumption of hand function with functional limits because of the rectitude of phalangeal index column, the mobility of the MF joint close to normal mobility allows the patient to carry the thumb-fingers pinch.

**Conclusions.** The vast majority of patients with macroductyly require surgical treatment. Clino-macro-dactyly or only macroductyly in adults must undertake staged corrective surgery, including soft tissue debulking, osteotomy for volume reduction (length, thickness) or axial deviation, partial or total amputation.

**KEYWORDS:** *Macroductyly; Clinodactyly; Lipofibromatous hamartoma ;Carpal tunnel syndrome;Hand.*

## PECULIARITIES IN THUMB REIMPLANTATION

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**Purpose.** We analyze the peculiarities of the thumb reimplantation whose algorithm must be modified depending on the level and mechanism of amputation in order to improve the success rate and functional outcome.

**Material and methods.** Between 1990 - 2015 of the 987 reimplantations, 123 were thumbs. Age ranged between 4-75 years, 101 males (82.1%), 22 females, 63 sharp amputations, 34 crushings, 26 avulsions. Peculiarities: Bone shortening was performed to avoid vascular grafts and to provide thumb stability in IP destruction. We prioritized stability over length conservation.

In IP level amputations combined with TELP and/or TFLP teno-muscular avulsion, IP arthrodesis was performed. When arterial termino-terminal anastomosis was not possible, various compensatory procedures were employed: rerouting of a nearby vessel, various vascular extensions based on anastomotic vessels, venous grafts. In proximal amputations (base M1) when the pollicis brevis artery is retracted, time should not be wasted in attempts to retrieve it, instead rerouting nearby arteries is preferred. We prioritize the quality of the neural anastomosis. If direct anastomosis was not feasible, nearby sensitive nerve rerouting or nerve grafting was performed. In trans-ungueal amputations (Ishikawa II-III), for better positioning under microscope, reimplantation begins with nerve and artery anastomosis followed by bone fixation. Skin defects were covered with flaps or skin grafts. To cover both skin and dorsal vein defects, we used 9 Foucher port vein kite flap and 6 Simonetta flaps. The concept of bank finger was applied for thumb reconstruction in pluridigital amputations.

All patients were heparinized. The vascularization of the reimplanted segment was followed up through a “skin window” that was also used for local heparinization (“biochemical leech”).

**Results.** The success rate was 84.3%. 2PD sensitivity was 8 - 14 mm. Thumb-digital pincer was possible in all cases (Kapandji scale 4-10). In TFLP and TELP avulsions, resection associated with TFS 4 and TEP2 transfer shortened the intervention time without affecting the quality of the recovery. The use of the “biochemical leech” for 5-8 days led to improvement of the results in distal reimplantations; 18 nail deformities (14.6%).

**Conclusions.** The sequence of the operative steps may differ from other type of reimplantations. Bone shortening is not contraindicated especially in trans-IP amputations. IP fusion provides solidity of a shorter thumb with no functional damage. Avoiding Pulvertaft in TFLP and/or TELP avulsion and IP arthrodesis are good strategy when tendons are avulsed from their muscles.

**Keywords:** *thumb, replantation microsurgical techniques, hand.*



## VASCULARIZED FLAPS IN THE TREATMENT OF SOFT TISSUE POSTTRAUMATIC DEFECTS IN THE ANKLE REGION

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**Introduction:** The management of soft tissue posttraumatic defects in ankle still represent one of the biggest problems for plastic surgeons. Perforator flaps are the last remarkable discovery in plastic surgery, which have a series of advantages: a simple technique of harvesting and application; minor donor site morbidity; short time and low cost of intervention; donor tissue structure similar to that of the recipient.

**Objective.** The aim of this study is to determining the effectiveness of different vascularized flaps in treatment of soft tissue posttraumatic defects in ankle region.

**Patients and methods.** The study included 56 patients with posttraumatic soft tissue defects in ankle, treated during the years 2011 - 2015 in the Clinic of Plastic and Reconstructive Microsurgery of the Institute of Emergency Medicine, Chisinau. Including, men – 35(62,5%), women – 21(37,5%), the average age being: 52 years (between 18 and 64 years). The size of soft tissue defects ranged from 3x5cm to 10 x 25 cm. The localization of defects was: medial site - 24(42,8%); lateral site – 11(19,6%); Ahile region – 15(26,8%); and anterior site - 6(10,8%). Was performed the following types of flaps: peroneal perforator - 21 (37.5%); tibial posterior perforator - 15 (26.8%); dorsalis pedis - 7(12.5%); supramalleolar - 8(14.3%), free flaps – 5(8,9%). 15(26,8%) of interventions were performed with the primary closure of the donor site, but 41(73,2%) were performed gradually.

**Results.** All flaps survived. In 5 (8.9%) cases developed marginal necrosis, in 2 (3.6%) cases - partial necrosis, which resolved with free skin grafts. In 7(12.5%) patients developed a transient venous congestion, in 2 (3.6%) cases were suppurative complications.

**Conclusion.** Perforator flaps from the distal 1/3 of calf prove to be the best option in the treatment of small to medium – soft tissue defects of ankle region. In big size defects free microsurgical flaps have no alternative and remain the best option.

**Keywords:** *Ankle defects, perforator flaps, free flap.*

## THE INDICATION OF SURGICAL TREATMENT FOR METACARPAL FRACTURES

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**Purpose.** The objective of our study is the evaluation of metacarpal fractures in the context of current knowledge.

Although most metacarpal fractures are treated nonoperatively, using closed reduction and immobilization, some displaced, incongruent or unstable fractures need open reduction and internal fixation. There are many operative techniques that can be used including Kirschner wires, cerclage wire, interfragmentary screw, intramedullary nail, plate and screws, or external fixation.

**Materials and methods.** We conducted a retrospective study on 59 patients operated in the Orthopaedics and Traumatology Clinic of Cluj-Napoca over a period of 3 years between 2012-2014. The analysis was made based on fracture type, fixation procedure and clinical and radiographic evaluation.

The metacarpal fractures represent 1% of total interventions in our hospital. We found 59 patients who suffered a metacarpal fracture at different levels of metacarpal bone (head, body, base) and treated by surgical treatment. From 59 patients, 26 suffered fractures of the metacarpal shaft, 17 fractures at the level of metacarpal base, 8 had metacarpal head fractures and 8 at unspecified level.

**Results and discussions.** Our study reveals the superiority of surgical treatment by open reduction and internal fixation with plate and screws compared with the other methods of internal fixation. Intramedullary fixation with Kirschner wires is not one of the best methods of internal fixation because it allows mobilisation of fragments in comminuted or spiral fractures. In two cases re-intervention was required after failed osteosynthesis with K wires and it was done by plate and screws fixation. On the other hand cerclage wire prevents movements, but can affect consolidation by affecting periosteal bone vascularization.

Any misalignment of metacarpal shaft is unsatisfactory for multiple skills including hand function, aesthetics and expression of emotions. Anatomic reduction must be done because if a degree of angular deviation persists, the gripping function will be damaged. If malrotation and gap between fragments persists, there will be a lateral deviation and overlapping of fingers in flexion.

**Conclusion.** Regarding metacarpal fractures we conclude that anatomic reduction and stable internal fixation is important because only consolidation in anatomical position can lead to restoration of normal function of the hand.

**Keywords:** *metacarpal, fracture, osteosynthesis.*

## DISTAL RADIUS FRACTURES TREATMENT USING LOCKING COMPRESSION PLATES

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**Background and aims.** Distal radius fractures are one of the most common fractures. Fractures associated with high-energy trauma are occurring in younger people, mostly males, and fractures associated with low-energy trauma are occurring in older persons, mostly females. [1,2,3]

The most commonly cited mechanism of injury in distal radius fractures is falling onto an outstretched hand, which involves a combination of axial loading, a bending moment, and either supination or pronation. Increasing wrist extension at the time of impact could result in more dorsal comminution. [1,2,3]

The purpose of this article is to present the results obtained by the surgical treatment of distal radius fractures, using the locking compression plates, in terms of fracture consolidation and articular function.

**Methods.** The study was conducted retrospectively on a total of 13 patients admitted between January 2014 to January 2015 in the Ortophedics and Traumatology University Clinic of Cluj-Napoca. The main indication of open reduction and internal fixation with volar reconstruction locking compression plates was a residual radial shortening of more than 2 mm, angulation over 10° or intra-articular displacement over 3 mm.

All the patients followed the same rehabilitation protocole - active mobilization of fingers under protection of wrist by an orthosis for 4 weeks. The evaluation of patients was performed considering the radiological outcome, range of motion in the injured wrist and presence of pain or other disability at three and six months follow-up.

**Results.** The radiological consolidation appeared after a mean of 6 weeks. Active range of motion of the wrist was restored at three months after surgery for most of the patients. One patient developed a complex regional pain syndrome at three months. We did not encounter any major complication intra or postoperatively.

**Conclusions.** Using the locking compression plates in treating of distal radius fractures offers the possibility to obtain good results in complex fractures or osteopenic bones with few complications encountered.

**Keywords:** *distal radius fractures, volar approach, locking compression plates.*

## NERVE REPAIR BY MUSCLE-VEIN.COMBINED NERVE GRAFT : SURGICAL TECHNIQUE AND ACTUAL INDICATIONS

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**Introduction.** Although autogenous nerve grafting is still considered the best method for bridging nerve defects, several alternative types of conduits (biological and synthetic) have been studied. We have demonstrated in previous experimental research that a graft made using a vein (providing a guide for nerve regeneration) filled with fresh skeletal muscle (to prevent vein collapse and support axon regeneration) gave similar results to traditional nerve grafts, in the rat. On this basis, we decided to use the muscle-vein-combined grafts in clinical cases not only for sensory nerves but also for mixed nerves. Despite continuous researches and surgical innovations, the treatment of peripheral nerve injuries remains a complex problem particularly in non sharp lesions where this kind of reconstruction is a good option of treatment. We report our case series and results.

**Material and methods.** Mixed nerves: we reviewed 23 patients operated from 1993 to 2004 with this technique. The mean follow up was 26 months (minimum 14 months – maximum 58 months). The mean length of conduits was 2.5 cm (0.5 to 6 cm). Case series: 4 radial nerve at the elbow level, 9 median nerve at the distal third of the forearm, 6 ulnar nerve at the forearm, 1 ulnar nerve at the wrist, 1 ulnar nerve at the arm, 2 proximal cord of the brachial plexus. Sensory nerves: we operated 13 patients for sensory nerve reconstruction at the hand and wrist level. About these patients 13 were operated in emergency for crush injuries of sensory and mixed nerves.

We evaluated our results by the criteria of the Nerve Injuries Committee of the BMRC modified by Mackinnon-Dellon. We classified the results in three groups with the grading system proposed by Sakellarides. Very Good:  $\geq$  M4 /  $\geq$  S3+; Good: M3 / S3-S2+; Poor:  $<$  M2 /  $<$  S2+.

**Results:** Mixed nerves: In 12 (52%) cases we had a good and very good results. In 6 cases (26%) a good sensory restoration has been not accompanied by a good motor recovery. In 2 cases (8.5%) we had a good motor recovery and a fair sensory recovery. In the last 3 cases (13%), in gap longer than 3 cm, we had a fair results both for sensory and motor recovery.

Sensory nerves: In the muscle-vein-combined group , 10 patients (76.9%) showed Very Good results while only 3 patients (23.1%) showed Good results.

**Conclusions.** The clinical employment of tubes as an alternative to autogenous nerve grafts is mainly justified by the limited availability of donor tissue for nerve autograft and its related morbidity. Indication, in this little series of patients operated in ten years, had been very restricted : treatment in emergency, not enough nerve graft, no will of the patient on harvesting a healthy nerve.

Our retrospective study demonstrated that favourable results can be achieved either for primary repair of crush injured nerves when a short gap is present or in secondary procedures mainly for sensory nerves. An attempt of reconstruction in emergency with muscle-vein combined graft or alternative conduits is justified considering the possible advantages offered by this kind of nerve repair.

## IMPROVING OUTCOMES USING SPARE PARTS IN REPLANTATION SURGERY

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Tissues of amputated or unsalvageable limbs may be used for reconstruction of complex defects resulting from severe trauma. This notion is called the “spare parts concept” and is now a well established option for surgeons. A reconstruction strategy to treat complex trauma at wrist and hand level can not ignore this concept which represents the ultimate form of reconstruction allowing the surgeon to exert his creativity, and at the same time drastically decreasing the donor-site morbidity. In emergency, the surgeon should optimize form and function, and not necessarily recreate the pre-injury condition but always think towards future reconstructions in the mangled hand. In other cases the goal should be a quick, simple and fast recovery avoiding stiffness and “useless” fingers in aged patients. Priorities are restoring circulation, repairing divided structures, and achieving stable and adequate coverage, sometimes sacrificing a ‘bad’ digit to privilege a better one.

Spare parts can be used as vascularized or non vascularized grafts, pedicled or free. In this review the different options and indications are schematized and illustrated for upper and lower limbs.

## EMERGENCY FREE FLAPS IN UPPER LIMB RECONSTRUCTION

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The concept of immediate treatment in one time of all injured tissues in complex trauma of the upper limb has been introduced in 1977 by Foucher. Debridement of all necrotic and contaminated tissues followed by immediate soft tissue coverage in order to obtain primary healing is nowadays the standard approach to all open injuries of the extremities. Other authors demonstrated the superiority of early closure with free flaps of complex lesions as to reduce risk of infection, hospital stay and improvement of flap survival rate both for upper and lower extremities. All delay in treatment will lead to higher risk of infection, granulation tissue formation and extended fibrosis, reduced flap survival rate, longer hospital stay, late rehabilitation and eventually poor function.

We report the results of a case series of thirteen upper limb emergency and delayed reconstruction (up to seven days) with free flaps. Indications are: free flaps are needed when the loss of substance is too large or too deep or too complex to be closed with a local or regional flap, and where a skin graft would be inappropriate because of poor bed conditions, or because it would compromise function or further reconstructions. Indications are represented by an exposed vital structure, high risk of infection, a flow-through flaps and a salvage flaps. Relative indications are represented by definitive reconstruction of fingers from the foot.

In this paper we present the results of this heterogeneous group of lesions and discuss the principles of free flap choice.

## TREATMENT OF PAINFUL NEUROMAS IN CONTINUITY OF THE MEDIAN NERVE WITH RADIAL AND ULNAR ARTERY PERFORATOR ADIPOFASCIAL FLAPS

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**Purpose.** To review the outcomes of 8 patients with painful median nerve neuromas at the wrist treated with external neurolysis and covered with pedicled perforator adipofascial flaps.

**Methods.** Between 2004 and 2010, we treated 8 patients, who had a mean age of 37 years, and who had posttraumatic painful median nerve neuromas at the level of the wrist but with retained median nerve function. All of them reported neuropathic pain and had a positive Tinel's sign over the site of the presumed neuroma. The surgical procedure included external neurolysis and coverage with an ulnar artery perforator adipofascial flap (4 patients) or with a radial artery perforator adipofascial flap (4 patients). Patients were reviewed after a mean follow-up of 41 months (range, 18e84 mo). Preoperative and postoperative pain was measured with a visual analog scale.

**Results.** Pain improved from a preoperative mean value of 7.8 to a postoperative mean value of 3.6. There was complete resolution of pain in 5 patients, mild pain persisted in 2 patients, and 1 patient reported no improvement. No complications occurred at the donor site.

**Conclusions.** Vascularized soft tissue coverage of painful median nerve neuromas is an effective treatment. We do not believe that a free flap is of any particular advantage over a local pedicle flap which we suggest using to protect the median nerve.

# LATISSIMUS DORSI FREE FLAP AND FASCIA LATA GRAFT FOR COMPLEX HEAD DEFECT RECONSTRUCTION AFTER WIDE BASOSQUAMOUS CELL CARCINOMA EXCISION. CASE REPORT

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**Background.** Basosquamous carcinoma has histologic features of both basal and squamous cell carcinoma. Up to 97% of basosquamous cell carcinomas are located in the head and neck area. It is radio-resistant and has poor prognosis. The treatment of choice is wide local surgical excision with negative tissue margins and long-term follow-up. Full thickness scalp basosquamous carcinoma with bone and meningeal involvement needs wide excision that will result in complex defects. Exposed brain requires dura mater reconstruction and extended soft tissue coverage such as free muscle or fasciocutaneous flap.

**Materials and methods.** A 57-year-old male presented with ulcerated, bleeding tumour in the frontal region and second tumor in periauricular area fixed to the parotid gland. Preop biopsy confirmed basosquamous carcinoma. CT-scan revealed tumor involvement of right orbit, frontal bone and possible contact to dura mater. The second tumor invaded parotid gland and the external auditory meatus.

Operation was performed in two teams, one including neurosurgeon (RF). Frozen sections guided the excision. The excision involved the tumor with large margins, orbital exenteration, frontal bone partially and dura mater, frontal sinus, lateral orbital wall and ear with soft tissue and parotid gland with facial nerv. Exposed brain was covered with fascia late graft and soft tissue defect of 25/25 was covered with free latissimus dorsi muscle anastomosed to thyroid artery and vein tributary to internal jugular vein. The muscle was skin grafted 14 days later.

**Results.** The flap survived entirely and skin graft fully integrated. The cerebrospinal fluid leak through frontal sinus subsided after lumbar drainage for 12 days. Lower left lobe pneumonia received specific treatment and extradural hematoma slowly resolved without motor impairment. Patient resumed ambulation 2 weeks postoperatively and was discharged 21 days postoperatively. Positive margins on dura mater and mastoid bone requires radiotherapy.

**Conclusions.** The treatment of choice for an invasive basosquamous cell carcinoma confirmed by histological evaluation is wide excision with negative margins resulting in a 25/25 cm craniofacial defect with exposed brain tissue without dura mater on a 9/8 cm surface. Using the fascia lata graft and the latissimus free flap followed by secondary skin grafting, we were able to have a successful reconstruction with good aesthetic outcome.



## UTILITY AND VERSATILITY OF ISLAND FLAPS USED IN HAND RECONSTRUCTION

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In our series of cases we present both the versatility and dependability of vascular or neurovascular flaps for adequate hand reconstruction, as well as evaluate patient satisfaction with the final results. Depending on the severity of the trauma sustained, the surface and/or length lost, recovery of normal mobility and overall function is variable and in close correlation with postoperative physical therapy.

The case series includes first dorsal metacarpal artery flaps, Littler neurovascular island flaps, a reverse radial forearm flap and a composite osteomyocutaneous flap performed either as single-stage primary reconstruction or in secondary cases. All of the flaps survived and were completely integrated.

Postoperatively we evaluated the functional and sensitive recovery and overall use of the affected limb, concluding that one stage reconstruction options respond best to our patients demands of quick social reintegration. The insular flaps bring good quality tissue to restore both substance and function. With careful selection of the most appropriate reconstruction technique and in the hands of an experienced surgeon, both defect and donor area morbidity can be minimized, and a maximum of hand function can be preserved.

One other conclusion of our study voices the need to properly explain both the procedure and the following physical therapy mandatory for a proper recovery of essential hand functions, outlining the importance of a good collaboration between surgeon, patient and physical therapist. Only by adequately adhering to all these steps will the recovery level reach its full potential.

**Keywords:** *island flaps, hand reconstruction, Littler flap, radial flap, first dorsal metacarpal artery flap*

## MANAGEMENT ASPECTS IN TREATMENT OF DEFECTS OF THE HAND WITH VASCULARIZED FLAP

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**Purpose.** Trauma of the hand, being one of the most common trauma of the upper limb, generates a series of complications on which ultimately depends the whole function of the limb. One of the complications encountered at the hand's level are tissues defects. The purpose of the current work is to evaluate the patients with tissue complications and to actualize their treatment management according to existing surgical methods.

**Material and method.** In clinic during the period of time of 2013-2014 year were 2518 patients treated, in 452 cases tissues defects were found. Defects of the I, II and third finger have predominated, constituting 112, 126 and 116 cases. Distal phalanx were more frequently affected, constituting 288 cases, middle phalanx – 122 cases and proximal phalanx – 42 cases. The arsenal of the used flaps was a varied one. We have used different types of flaps: advancement, thenar, island digital, cross-finger method, inter metacarpal, interosseus antebrachii posterior, radial and ulnar, perforator, inguinal and free microsurgical.

**Discussions.** Existent arsenal of flaps is sufficient for solving any defect of the hand. Discussed question is when are indicated vascularized flaps. However, we have to take into consideration the possible occurrences of complications, especially of those vascular.

**Conclusion.** Basic principles in treatment of the hand's defects remain unchanged. Variable arsenal of the flaps have influence only on the variety of the proposed methods. As absolute indications for flaps are the situations when, beside the tissue, are affected skeleton, nerves, vessels and tendons. At the same time the free skin graft isn't removed from the use and it is applied in cases when flaps aren't indicated.

## BREAST RECONSTRUCTION ON A LOCAL ACTINIC AFFECTED TERRITORY BY CONSECUTIVE USING OF THE LATISSIMUS DORSI FLAP PLASTY AND DERMOTENSION

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**Purpose.** Breast reconstruction after cancer amputation by coordinating properly the cancer treatment with the plastic reconstructive and aesthetic surgery.

**Material and methods.** This paper describes a clinical case. A 33 years old female was subjected to total breast amputation because oncology. After surgery she followed 3 cycles of radiation therapy. At 6 months after primary surgery she undergone a comprehensive multilateral examination after which has received medical agreement for plastic restoring of the amputated breast. At the moment of the examination in the plastic surgery clinic she has been complaining on pain in the region of the scar left after breast amputation which were exacerbated in thoracal inspiration. In the first stage of the treatment it was decided to remove the aggressive adhered on hemithorax scars and to do the plasty of the defect left after removing them with a free latissimus dorsi flap. The second surgery stage followed after getting the first stage regeneration and was constituted of implanting a tissue expander with a maximum volume of 500 ml. The third surgery stage took place after filling the expandable balloon. Under the tissue's excess instead of expander we have placed a mammary prothesis.

**Results and discussions.** The objective of the first surgery were the pains caused by the postamputational aggressive adhered on hemitorax scars. Knowing that one of the treatment factors was actinic radiation, the fear for the removal of the scar and the plasty of the defect with local tissues was substantiated. Thus, we decided to use latissimus dorsi flap from the healthy region. Its maimal dimensions didn't allow full coverage of the defect, but have allowed expanding resulting with restoration of the breast by placing a mammary implant. All interventions have had a primary regeneration.

**Conclusions.** Using the methods of plastic-reconstructive and aesthetic surgery in a correct order allows the rebuilding of the breast after oncological amputations even if the region is treated actinic.

**Keywords:** *breast reconstruction, latissimus dorsi flap, dermotension, actinic radiation*

## POSSIBILITIES AND LIMITS IN MIGRATION OF PERONEAL OSSEOUS FLAP

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**Purpose.** Highlighting of all the possible variants of the peroneal flap's migration, revealing the possible and impossible limits of its use, the indications, the contraindications in order to obtain the expected results.

**Material and methods.** Peroneal island flaps were used in our study on 25 patients for treatment of bone defects of the segment, in 3 cases the transplanted flaps were osteo-fascio-cutaneous and in 1 case – fascio-cutaneous. Fibular flap has been applied to cover the 7 territorial regions of the lower limb: distal femoral area – 2 (6.9%) cases, knee joint – 1 (3.4%) case, upper third of the leg – 1 (3.4%) case, medium third of the leg – 3 (10.3%) cases, distal third of the leg – 8 (27.6%) cases, talocrural joint – 9 (31.0%) cases and foot – 5 (16.9%) cases. Fibular flap is unique and possesses a broad spectrum of application because of its possibility of extending on the neighboring surfaces. In order to systematize the material, we have introduced for the bone fragment the terms „flip” and „align” at the skeleton of the treated member.

**Results and discussions.** Postoperative complications were recorded at 5 patients, what constitutes 15.62%. In 1 case with distal migration of the osteomuscular flap used to cover a distal crural defect, occurred the flap's necrosis by unidentified vessels thrombosis. The case was settled by shortening the leg and stiffening of the talocrural joint. In the other 2 cases occurred necrosis of the cutaneous component of the myoosteocutaneous flaps, due to the absence of a preoperative specification of the output's place of the cutaneous perforating vessel from fibular pedicle and due to the absence of the vascularization of this area or due to damage of the vascular relations between the pedicle and cutaneous portion during the migration to defect. The cutaneous autografting of the flap's muscular portion has solved these cases. In the late postoperative period we have determined a „fatigue fracture” of the fibular transplant.

### Conclusions:

1. The peroneal island flap covers defects localized from the foot to the medium third of the thigh, using for this purpose 2 options: migrating through the „flip” and „alignment”.

2. In order to avoid postoperative complications is indicated the examination of the central vascular paths of the leg, including the perforating vessels from the peroneal one.

**Keywords:** *peroneal osseous flap, limits, migration.*

## USE OF THE ISLAND TEMPORO-FRONTAL FLAP IN RECONSTRUCTION OF THE PAVILION OF THE EAR

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**Purpose.** The reconstruction of the pavilions of the ear bilateral in one surgical step.

**Material and methods.** Our experience is constituted by 2 clinical cases in which we have used predominately island temporo-frontal flaps bilateral. Both patients were males, with the ages of 36 years and 47 years. Mutilation was produced during a fire with flame. Both have suffered serious burns including head. During the recovery period, after the discharge in the satisfactatory condition from the medical unit, patients have been consulted repeatedly in order to improve the aesthetic. The use of island temporo-frontal flap was caused by poor condition of the tissues around the ears. In both cases the reconstructive surgery was performed bilaterally in one surgical session.

**Results and discussions.** Both the flap's donor area and the containers have undergone primary regeneration. Pleasant shape and appearance of the auricular pavilions were restored. Patients were satisfied with the results. The main advantages of this plastic method are conducting them in a single step as opposed to classical methods and the ability to use them even in infected defects relying on their good vascularization. Some disadvantages such as lack of cartilage in flap's composition or its frontal location can reduce their spectrum of use.

**Conclusions:**

1. The island temporo-frontal flap rised on temporal vessels offers perfused tissues identically colored with skin of the auricular pavilions in sufficient quantities for the plasty of the tissues defects in this region.
2. Reconstructive surgeries with this flap if necessary will be carried out bilaterally in one surgical session.

**Keywords:** *island temporo-frontal flap, the pavilion of the ear.*

## FASCIOCUTANEOTENDINOUS FLAP OF THE LEG – A NEW METHOD OF TREATMENT OF SEPTIC DEFECTS OF ACHILIAN TENDON

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**Purpose.** Readjustment of septic hotbed of the Achilles region and vascularized plasty of the tendon defect – performed in one surgical step using a perforator fascio-cutaneo-tendinous flap.

**Materials and method.** In this study we presented the surgical one-stage treatment technique of infected tendocutaneous Achilles area defects. For this purpose, the authors transplanted in 11 patients a sural complex tendocutaneous flap on peroneal perforator vessels with application of “propeller” technique. Operations have been performed with presence of infection and function disorder in all patients.

A complete wound recovery was obtained. During postoperative period at 30<sup>th</sup> day the ultrasonography determined a good blood circulation in flap and tendon transplant with complete fusion features. At 3<sup>rd</sup> month the patients were walking without limping and the aesthetic result was appreciated with 20-28 points on POSAS scale.

**Discussions.** Fascio-cutaneo-tendinous flap is harvested on the sural axis. In this way we could talk about a neurocutaneous flap, but its migration in defect is made using “propeller” technique based on a peroneal perforator vessel. Thus, we consider that this flap is a perforator one. Indications for its use are infected defects of Achilles tendon in association or not with tissues defect. Because the presence of an infected tendon defect with a sufficient coverage of tissue can be treated without a remission for 6 months only by plasty with vascularized tendon.

**Conclusions.** Fascio-cutaneo-tendinous flap of the leg collected on peroneal perforator vessels and migrated using “propeller” technique allows a one step recovery of the infected Achilles tendon defects, showing in the end good functional and aesthetic results.

**Keywords:** *fascio-cutaneo-tendinous flap, perforator, propeller, peroneal.*

## FLEXOR TENDON REPAIR SURGERY, LET'S NOT FORGET THE BASIC!

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Reconstructive surgery of the flexor tendons continues to remain a topic of interest and the attempt to obtain a qualitative result from the point of view of functionality involves complying with exact practical exigencies, which have been verified and confirmed through a very long practice. I consider that a discussion on this topic is very welcome for at least three reasons: the frequency of the lesions in the daily practice, the value of a correct flexion in the global prehension movement of the human hand and last, but not least, the difficulties created by treating the complications resulted from these lesions. For the past 25 years the surgical strategy has continuously evolved and this is strongly related to the understanding of the vascularization, nutrition and healing mechanisms of the tendon in each of the 5 clinical anatomical areas covered from the forearm to the terminal level. More over a long this anatomical way the tendon is an element that transmits the flexion movement, this function can only be recovered through closely monitored movement and this can only be achieved after a correct reconstruction from a technical point of view, followed by a closely monitored post-operative recovery. Thus we can point out the two essential exigencies of qualitative recovery: primary repair and early mobilisation. In conclusion, although modern reconstruction of the flexor tendon has reached real recovery performances, it is still based on a statement of profound practical resonance belonging to one of the forefathers of this type of surgery, Pulvertaf 1948: "It is not difficult to suture a tendon; the problem is to obtain an easily sliding and functional tendon".

**Keywords:** *flexor tendon, recovery, primary repair.*

## RECRUDESCENCE OF THE FACIAL CUTANEOUS TUMORS

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For the last few years we have witnessed an increase in the frequency of facial cutaneous tumours. The interest towards the localisation of these tumours is maintained by two aspects: the removal of the tumour must comply with the radicalness of oncology and the reconstruction of the excisional defect must restore both the functionality and the aesthetic aspect of the targeted anatomical area. Based on the size and characteristics of the excisional defect, we have used, with predilection, local neighbouring solutions in reconstructive surgery. For excisional defects that present great tissue sacrifice, we have taken into consideration different reconstructive solutions using distant grafts, with or without microsurgical techniques. Several clinical cases are presented for both the above-mentioned strategies. We present our clinical recently experience over 259 cutaneous tumours operated in the last 4 yrs. (2011 – 2014) including 146 facial localisation. From this cases the woman have been 146 cases and males 113 cases; the dominant age was 70 – 80 yrs. In our experience, the oncological problem is the one that continues to dominate the evolution of the case, which sometimes leads to a fatal evolution despite the momentary successful reconstructions. In conclusion, we might be able to control this type of pathology by using an adequate oncological treatment, when possible, while monitoring the patient for at least 5 years and by using a correct surgical treatment as early as possible.

**Keywords:** *tumours, aesthetic aspect, oncological treatment.*



## OPEN FRACTURES OF THE PHALANX OF THE HAND

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**Introduction.** The open fractures of the hands are leading in all musculoskeletal traumas. In 25% of cases traumas are accompanied by soft tissue defects requiring complex reconstructive procedures. (Ameziane L.)

**Purpose.** Presenting clinical data on epidemiology, anatomical location, severity classifications according to Duncan and HISS score and methods of treatment used for open fractures of phalanx of the hand, as well as the frequency of their association with soft tissue defects, bone defects, and concomitant tendons and nerves lesions.

**Methods.** Retrospective chart review was conducted in patients who had surgical repair of open fractures of hand's phalanx associated with soft tissue defects, bone defects, and concomitant tendons and nerves lesions in the period of time 2013-2014. During this period, from 1203 patients with urgently surgical intervention, in 172 (14%) cases were with open fractures of hand's phalanx. Data were grouped by gender where the prevalence of male lead with 156 (91%) cases. The average age of traumatized patients was 30-40 years, persisting in 118 (69%) cases. According to the location of the fracture we observed a prevalence of the third finger - 45 (26%) cases, followed by the second finger - 41 (24%) cases, while the fifth finger was affected in 22 (13%) cases. HISS score showed that moderate and severe traumas prevailed - 113 (66%) cases. According to the Duncan's classification we have also observed a prevalence of type II fractures - 43 (25%) cases and IIIA - 46 (27%) cases.

**Results.** All open fractures have been surgically assisted in emergency in the first 24-48 hours after the trauma. In 117 (68%) cases the open fractures of the hand's phalanx were associated with tissues defects, bone defects or with concomitant tendons and nerves lesions. From the methods of osteosynthesis have prevailed the osteosynthesis with Kirschner wires. In cases with open fractures associated with tissues defects the vascularized plasty method was a method of first choice.

**Conclusions.** Moderate, severe and major open fractures of the hand's phalanx, according to HISS score, requires a complex and urgent approach in this type of trauma and correlated to the outcome of injury.

The Duncan classification dictates a tactic of surgical treatment depending on the degree of the fracture, I, II or III.

**Keywords:** *open fracture, hand, defect.*

## ORTHOPLASTIC SURGERY - SUCCESSFULLY TREATMENT OF SEVERE INJURIES USING AN INTERDISCIPLINARY APPROACH

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**Introduction.** Orthoplastic Surgery can be defined as “the principles and practices of both specialties Orthopedic and Plastic Surgery applied to a clinical problem, either by a single provider, or teams of providers working in concert for the benefit of the patient”. Reconstructive microsurgery is vitally important in orthoplastic reconstruction. Traditionally, in Romania, plastic surgeons were those who have done intensively microsurgery. Plastic Surgery is a specialty that mainly concentrates on form, function, soft tissue reconstruction and aesthetics. Orthopedics is a specialty that mainly concentrates on functional biomechanics, bone, and joints. The blending of these two specialties, “orthoplastic surgery”, simultaneous applies the principles and practices of both specialties to clinical problems.

**Material and methods.** We describe our surgical techniques that we used for treatment of different types of injuries of the limbs- trauma, tumor and osteomyelitis. All the patients were treated in the Clinical Emergency Hospital of Bucharest in an orthoplastic manner collaborating with the Plastic Surgery and Reconstructive Microsurgery Department and the results were compared with that from literature or other emergency hospitals (Trauma Hospital of Innsbruck). The cases were represented by high-energy trauma, invading tumors of both limbs (distal femur, distal radius) and cases of chronic osteomyelitis.

**Results and discussions.** The majority of the patients were treated successfully; some of the difficult cases were young patients and our surgical treatment saved them from limb amputation (distal femur GCT, femoral osteomyelitis). Our mainly concept was the “fix and flap” theory that we can adapt in all the anatomical segments of the limbs with an early soft-tissue coverage and a good skeletal stability.

**Conclusions.** We successfully demonstrate that using an interdisciplinary approach of the patients using both Orthopaedics and Plastic Surgery principles we manage very difficult cases giving good chances for the patients, especially the limb salvage situations.

**Keywords:** *orthoplastic microsurgery, limb salvage, “fix and flap”.*

## ORTHOPLASTIC MICROSURGERY

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Levin SL defined Orthoplastic Surgery as “the principles and practices of both specialties Orthopedic and Plastic Surgery applied to a clinical problem, either by a single provider, or teams of providers working in concert for the benefit of the patient”. Reconstructive Microsurgery is vitally important in orthoplastic reconstruction. Traditionally, in Romania, mainly plastic surgeons have done microsurgery. Plastic Surgery is a specialty that mainly concentrates on aesthetics, form, function and soft tissue reconstruction. Orthopedics is a specialty that mainly concentrates on functional biomechanics, bone, and joints. The blending of these two specialties, “orthoplastic surgery”, simultaneous applies the principles and practices of both specialties to clinical problems.

## VASCULARIZED BONE GRAFTS FOR SEGMENTAL BONE DEFECTS AND NON-UNION

D. ZAMFIRESCU<sup>1</sup>, G. POPESCU<sup>2</sup>, OLIVERA LUPESCU<sup>2</sup>, MIHAI NAGEA<sup>2</sup>, D. TANASE<sup>2</sup>, I. CRISTESCU<sup>2</sup>,  
C. ANGHELUTA<sup>2</sup>, I. LASCAR<sup>2</sup>

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**Introduction.** Free vascularized bone grafts were found to be effective where a massive bone defect resulted after a trauma or from wide tumor resection.

**Patients and methods.** We present our experience - a few clinical cases with free vascularized bone grafts for large post-traumatic bone defects, impossible to treat using other methods.

**Results and discussion.** Our experience with microvascular transfer of fibular and radial grafts has shown that massive autogenous bone grafting with an intact vascular pedicle decreases the time to bony union and the duration of immobilization required for functional reconstruction of an extremity. The technique has proven reliable in the reconstruction of bone defects of greater than 6 to 8 cm following defects existing in a fibrotic, avascular bed. More importantly, these techniques have been applied for limb salvage in patients with severely traumatized extremities that were not candidates for more traditional methods of bone grafting. Donor site morbidity was negligible.

**Conclusions.** Those data suggests that vascularized bone grafts represent a valuable procedure for reconstruction of large, previously infected shaft defects.

## MICROSURGICAL FIBULAR FLAP FOR TREATMENT OF AVASCULAR NECROSIS OF THE FEMORAL HEAD

DRAGOS ZAMFIRESCU<sup>1</sup>, C. ANGHELUTA<sup>2</sup>, A. URSACHE<sup>2</sup>, I. CRISTESCU<sup>2</sup>, I. LASCAR<sup>2</sup>

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Avascular necrosis of the femoral head is a potentially disabling disease that usually leads to destruction of the femoral head in patients. Its etiology and pathogenesis are unknown, despite recognition of various associated factors, such as trauma, coagulation abnormality, corticosteroid administration, excessive alcohol intake, and dysbaric phenomena.

Many techniques have been introduced to salvage the femoral head, including core decompression, osteotomy, and bone grafting. Results of these procedures have been inconsistent. Total hip arthroplasty is the treatment with the highest likelihood of providing symptom relief and good functional outcomes, but indications for this method are limited by device failures and prospects of repeated replacement of hardware in patients who undergo arthroplasty at a young age.

The use of microsurgical bone flaps in treating avascular necrosis of the femoral head was initiated in an effort to enhance revascularization and to arrest the progression of the necrosis. Since Meyers first reported on the microsurgical fibular flap as a treatment for osteonecrosis of the femoral head in 1978, many surgeons have performed this procedure for avascular necrosis of the femoral head, and satisfactory results have been reported.

In this work, we will discuss history, indications, techniques, and our results of using microsurgical fibular flaps in the treatment of avascular necrosis of the femoral head.

## LOWER LIMB VS UPPER LIMB REPLANTATIONS

DRAGOS ZAMFIRESCU<sup>1</sup>, A. STEFANESCU, C. POPOVICIU<sup>2</sup>, I. LASCAR<sup>2</sup>

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**General considerations.** Today, upper limb replantation is a common procedure in most plastic surgery units. The need for reconstruction of lower limb amputations is increasing, due to high-energy trauma in road accidents and work-related injuries. The indication for lower limb replantation is still controversial. Compared with upper limb replantations, indications are more select due to the frequent complications in lower limb salvage procedures, such as severe general complications or local complications such as necrosis, infections, nonunions, the need for secondary lengthening, or other reconstructive procedures. The satisfactory results given by artificial prosthesis, such as quicker recovery time and fewer secondary procedures, also contribute to the higher degree of selection for lower limb replantation candidates.

**Patients and methods.** We present our experience with upper and lower limb replantations, compare those procedures and their final outcomes, trying to evaluate the correct indications and establish a therapeutic protocol.

**Results and discussion.** We had a large number of upper limb replantations, so we gain a lot of experience in this field. In comparison with the upper limb, we had a smaller number of lower limbs replanted, but we observed, in some of those cases good functional outcome, that encouraged us to extend our knowledge in this procedure.

**Conclusions.** Upper limb replantation is an established procedure, but lower limb replantation is rarer. Lower limb replantation may have successful outcomes if careful selection of patients takes place. Despite varying outcomes following successful replantation surgery, patients generally prefer to retain their own limbs rather than have a prosthesis and this should be considered as part of the informed decision making process by clinicians.

## MICROSURGICAL RECONSTRUCTION OF THE HEAD AND NECK

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## UROPLASTIC MICROSURGERY

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In 1967 Ota published first paper about experimental microsurgery on male urinary and genital system. There are some applications of microsurgery in Urology: renal microsurgery, Surgery of extrarenal excretory apparatus in pediatric population, reversal vasectomy, penis replantation, reconstruction, and reconstruction. We present our experience in uroplastic Microsurgery.

## ADULT AND OBSTETRICAL BRACHIAL PLEXUS RECONSTRUCTION

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Obstetrical brachial plexus palsy is commonly attributed to excessive traction applied to the baby's neck during a difficult delivery. The majority of infants with brachial plexus palsy recover spontaneously within the first 3 months of life. However, in 10 to 30 percent of cases, the recovery is incomplete. Global palsy and the absence of biceps muscle function at 3 months of age have been adopted as the main indications for early brachial plexus microsurgery. In this presentation, we review the history of obstetrical brachial plexus palsy, the epidemiology and cause, and the indications for and the timing of surgery. Obstetrical brachial plexus injuries may require multistaged reconstructive procedures, including neurolysis, resection of neuromas, identification of intraplexus and extraplexus donor nerves, selective neurotizations, selective nerve transfers, and nerve grafting. Finally, we present our results in microsurgical reconstruction of obstetrical brachial plexus palsy.

## HEPATIC ARTERY ANASTOMOSIS IN LIVING DONOR LIVER TRANSPLANTATION FROM MICROSURGEON'S POINT OF VIEW

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**Background.** In living donor and split liver transplant surgery reconstruction of the hepatic artery is difficult because the graft hepatic artery is too fine to anastomose even using surgical loupes. The incidence of hepatic arterial thrombosis (HAT) was high before the introduction of microsurgical techniques. The results have improved dramatically and microsurgical techniques have become essential. In this presentation, we describe the microsurgical techniques for anastomosis of the hepatic artery and discuss them from the microsurgeon's point of view.

**Materials and methods.** Between 2012-2014, 17 patients with end-stage liver disease underwent LDLTx at the Fundeni Clinical Institut (in 1 case, the transplant surgeon anastomosed the hepatic artery using surgical loupes and checked by the microsurgeon, in 16 cases, the hepatic artery was anastomosed using an operating microscope, in 13 cases, a microsurgeon performed the anastomosis, in 3 cases, a transplant surgeon anastomosed the hepatic artery under the supervision of the microsurgeon).

**Conclusions.** our basic concept is to create the best possible conditions for anastomosis and to perform a simple end-to-end anastomosis. tilting the operating table, placing a surgical towel in the right upper quadrant, retracting the right costal arch, and retracting the graft and the intestines, the parallel direction of the vessels in relation to the surgeon in the horizontal plane facilitated the anastomosis. Because this contributes to the safety of the procedure, we believe a microsurgeon with vast experience in microvascular anastomosis should participate in the LTx operations with HA diameter under 2 mm.

## **LESSONS LEARNED IN 17 YEARS OF MICROSURGERY**

**DRAGOS ZAMFIRESCU**

**Zetta Clinic, Bucharest, Romania**

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Becoming a good doctor and an experienced Reconstructive Microsurgeon can be a long and winding road with a lot of success but also disappointing moments. This presentation is focused on a one surgeon's personal experience in Microsurgery during the last 17 years. It will be presented some lessons learned in that period of time. Micro cases take a long time, are fraught with potential complications and failure, make things inconvenient for everyone involved from our nurses to the OR staff to our very own families. I can't speak for anyone other than myself, but it remains the most challenging part of my practice. The aim of this presentation is to show you the same thing that I was fortunate enough to see in my training - that microsurgical cases demand the most of you as a surgeon, but can also be the most rewarding.

## **VASCULARIZED COMPOSITE TISSUE ALLOGRAFTS – CLINICAL APPLICATIONS AND EXPERIMENTAL MODELS**

**D. ZAMFIRESCU, ELENA PETRAȘCU, A. BULARDA, C. POPOVICIU, MARCO LANZETTA, IOAN LASCĂR**

**Zetta Clinic, Bucharest, Romania**

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In contrast to visceral solid-organ transplants, a vascularized composite tissue allograft (CTA or VCA) is not a single tissue, and is histologically heterogeneous. It is a neurovascularized module of nonvital tissues which include structural, functional and aesthetic units. CTAs are composed of a large spectrum of ectodermal tissues: epidermis and epidermal derivatives such as nails and hair, nerves and mesodermal tissues such as dermis, muscles, bones, articular cartilage, ligaments, tendons and paratenon and other supportive and connective tissues, adipose tissue, vessels. In addition there are hematopoietic tissues and cells from bone marrow and lymph nodes and these latter elements are immunocompetent. Each tissue has differing antigenicity, displays different antigen expression and presentation mechanisms. As a result, CTAs elicit nonsynchronized immune responses, of differing intensity, among their tissue components. So far only 135 CTA transplantations were carried out on human patients: 68 hand transplantations (49 patients), 12 abdominal wall transplantations, 9 bone and vascularized articulations transplantations, 7 peripheral nerves, 2 tendons, 23 larynxes, 1 right abdominal muscle, 1 tongue, a lobe made of the cephalic cervical skin and 2 ears, and 11 faces.

## DELAYED VENOUS REPAIR FOR DISTAL PHALANX REPLANTATION

DRAGOS ZAMFIRESCU, IOAN LASCAR, ANDREI STEFANESCU

**Background.** Vein anastomosis is the most important factor determining the success in the replantation of distal phalanx amputations. It is very difficult to find the collapsed veins and to perform vein anastomosis immediately after arterial repair. We have chosen to delay for at least one hour the veins repair to give time to the veins to expand to a more reasonable diameter for repair.

**Aim.** The purpose of the study was to show that the delayed venous method provides a higher rate success rate in distal phalanx replantations and does not require use of specialized techniques.

**Methods.** The delayed venous method for vein anastomosis was used for the last 2 years. This surgical procedure includes initial arterial anastomosis, delayed expansion of the vein, and subsequent vein anastomosis after at least one hour of waiting.

**Results.** The delayed method was used in 7 cases. Expansion of veins up to 1 mm or more resulted in a high success rate (71%). In contrast, the success rate for distal phalanx replantation is extremely low in other techniques because of the difficulty of vein finding and anastomosis.

**Conclusions.** The delay venous method allows easier anastomosis of the subdermal veins of the distal phalanx. Therefore, it is a useful operative technique for treatment of amputated distal phalanx amputation.

## VASCULARIZED BONE MARROW TRANSPLANTATION MODEL IN RATS AS AN ALTERNATIVE TO CONVENTIONAL CELLULAR BONE MARROW TRANSPLANTATION

D. ZAMFIRESCU<sup>1</sup>, I. ZEGREA<sup>1</sup>, M. POPESCU<sup>1</sup>, A. STEFANESCU<sup>1</sup>, A. LUPU<sup>1</sup>, M. SIMIONESCU<sup>2</sup>, M. LANZATTA<sup>3,4</sup>, I. LASCAR<sup>1</sup>

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<sup>4</sup>University of Canberra, Australia

**Background.** Current protocols for bone marrow transplantation (BMT) involve removing the bone marrow component directly from its donor microenvironment and then injecting such components into the circulatory system of the recipient. Vascularized bone marrow transplantation (VBMT), in comparison with conventional marrow transplants, has the advantage of providing a microenvironment and immediate engraftment of both mature and progenitor hemopoietic cells at the time of transplantation. The aim of the study was to follow the development of microchimerism after allogeneic VBMT vs conventional BMT.

**Methods.** In one group a VBMT model consisted of a donor Brown Norway (BN) rat hind limb heterotopic transplanted on recipient Lewis rats was used. In the second group a VBMT model consisted of a donor Brown Norway (BN) rat femur heterotopic transplanted on recipient Lewis rats was used. An intravenous infusion of donor bone marrow cells in suspension equivalent to that grafted in the vascularized femur limb was administrated i.v. on recipient rats in the third group. Cellular microchimerism was investigated in recipients of VBMT vs BMT.

**Results.** Donor-derived cells could be detected in VBMT recipients at 30 and 60 days but not in recipients of i.v. suspension BMC grafting.

**Conclusions.** VBMT provides a theoretical alternative to conventional cellular bone marrow transplantation by addressing crucial clinical problems such as failure of engraftment or graft versus host disease. It may be possible to develop a new approach for bone marrow transplantation based primarily on a microsurgical procedure (transplantation of vascularized bone marrow flaps).



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