

SWISS  
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## ABSTRACTS AND POSTERS

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**54<sup>th</sup> Congress of SWISS PLASTIC SURGERY**  
**6<sup>th</sup> Congress of SWISS AESTHETIC SURGERY**

- Reconstructive and aesthetic rhinoplasty
- Otoplasty
- Lower limb reconstruction

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## FREE COMMUNICATIONS 1: RESEARCH

(FR 21.09.18 – 09:10 – 10:00)

### The role of lymph nodes transfer and lymphangiogenesis in vascularized composite allotransplantation

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#### Background

The lymphatic system is involved in modulating inflammation, autoimmune disease, and immune-rejection processes. The lymph nodes (LN) play an important role in inducing peripheral tolerance after transplantation. However the role of lymphatic reconstitution after vascularized composite allotransplantation (VCA) has not previously been studied. The aim of this study is to assess the impact of regional donor LN and lymphangiogenesis on graft survival after VCA.

#### Materials and Methods

16 Brown-Norway to Lewis rats hind-limb transplantations were performed; 8 received grafts with popliteal and inguinal LN (LN+) and 8 received grafts depleted of all LN (LN-). Lymphangiogenesis was assessed by daily Indocyanine lymphography. Rejection was graded macroscopically from 1 to 3 (most severe). Blood, LN, skin, spleen, thymus, and bone marrow were collected at endpoint to assess donor/recipient lymphocyte composition.

#### Results

Rats reached grade 3 rejection between 7-10 days. There were no differences in graft survival between the two groups. There was significantly more chimerism in the LN+ group compared to the LN- group, specifically in the regulatory T cell, granulocyte, and monocyte populations ( $p=0.02$ ,  $p=0.03$ ,  $p=0.04$ ). Lymphangiogenesis occurred earlier in the LN+ group compared to the LN- group.

#### Conclusion

Hind-limb transplantations with LNs showed increased regulatory T cells, granulocyte, and monocyte chimerism in the recipient. While LN status did not affect graft survival, lymphangiogenesis occurred earlier when transplants included LNs. These results underline the potential of specifically targeting lymphatic vessels and LN to influence VCA rejection.

## Assessing the role of the hippo signalling pathway in basal cell carcinoma

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### Introduction

BCC is the most common cancer in white population. BCC development is primarily driven by the sonic hedgehog (SHH) pathway. The arrival of hedgehog inhibitors changed radically the treatment of advanced BCC. Resistance to treatment quickly appeared. The hippo pathway, which is often mutated in BCC, may play a pro-oncogenic role in BCC development and resistance, which we investigate in our project.

### Material and methods

We compare the baseline mRNA level of SHH and Hippo pathway in fresh BCC and healthy human skin, we then compare it with two cell line models (HaCaT, UWBCCT2). We analyse the mRNA level in human and cell lines to confirm their similarities. Finally, the mRNA level and proliferation rate of cell line with the adjunction of HH inhibitor (Vismodegib) or Hippo inhibitor (RB1023Z) were evaluated.

### Results

We confirmed a similar baseline level in BCC and healthy skin compared with UWBCCT2 and HaCaT cell line for Patch1 and Gli1 gene expression. The HaCaT cell line and BCC cell line (UWBCCT2) treated with Vismodegib showed similar down regulation of PATCH1 and Gli1 mRNA expression (SHH) and up-regulation of CTGF (Hippo). The reduction in the proliferation rate was much more important in BCC cell line than in keratinocyte cell line. When blocking Hippo pathway, we also observed a down regulation of Hippo mRNA level on both cell lines and similarly an important reduction of the proliferation rate in BCC cell line.

### Conclusion

This work highlights the potential role of Hippo-Pathway as a pro-oncogenic factor. Molecules targeting Hippo-pathway could be an interesting approach to treat BCC.

## Neurogenic evaluation of immunophilin ligands in vitro

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### Introduction

Tacrolimus (FK506), Cyclosporine and Rapamycin are belonging to a class of immunosuppressive drugs (ISD), called immunophilin ligands that are specifically binding to immunophilins. These ligands have already shown neurotrophic effect on nerve regeneration after injuries as well as neuroprotective effects. This study is aiming to compare the effect on neurite outgrowth and cells survival of widely used immunosuppressant immunophilin ligands that are Cyclosporine, FK506 and Rapamycin at different concentrations. Our model targets to assess the isolated outcome of the tested drugs on neurite outgrowth by using a minimalistic growth medium.

### Materials

Dorsal root ganglia (DRG) from D11 chicken embryos were explanted and seeded, one per well, on multi-well plates. These DRG were grown for 48 hours in different serum-free media supplemented with ISD. 1nM, 10nM, 25nM, 50nM, 100nM and 200nM concentrations of FK506, Cyclosporine and Rapamycin have been used. These groups were compared to a control of the basal medium without addition of any ISD. After incubation, we assessed the neurites outgrowth of the seeded DRG with the use of phase-contrast and fluorescence microscopy.

### Results/Conclusion

This study revealed a direct positive dose-dependent neurogenic effect of immunosuppressive drugs on primary neurons. All ISD indicated a significantly higher neurite outgrowth compared to controls. These findings are encouraging us in the process of assessing the effect of systemic and local delivery of immunophilin ligands on nerve survival on an in vivo model of chronic nerve compression.

## Adipose derived stem cells reduce fibrosis and promote nerve regeneration in rats

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Peripheral nerve regeneration is critical and challenging in the adult humans. High level of collagen infiltration (i.e., scar tissue), in the niche of injury, impedes axonal regeneration and path finding. Unfortunately, studies focusing on the modulation of scar tissue in the nerves are scarce. To address part of this problem, we have evaluated the differentiated adipose derived stem cells (dASCs) for their antifibrotic and regenerative effects in a 10 mm nerve gap model in rats. Three different animal groups (N 5) were treated with fibrin nerve conduits (empty), or seeded with dASCs (F 1 dASCs) and autograft, respectively. Histological analysis of regenerated nerves, at 12 weeks postoperatively, revealed the high levels of collagen infiltration (i.e., 21.5%  $\pm$  6.1% and 24.1%  $\pm$  2.9%) in the middle and distal segment of empty conduit groups in comparison with stem cells treated (16.6%  $\pm$  2.1% and 12.1%  $\pm$  2.9%) and auto-graft (15.0%  $\pm$  1.7% and 12.8%  $\pm$  1.0%) animals. Thus, the dASCs treatment resulted in significant reduction of fibrotic tissue formation. Consequently, enhanced axonal regeneration and remyelination was found in the animals treated with dASCs. Interestingly, these effects of dASCs appeared to be equivalent to that of autograft treatment. Thus, the dASCs hold great potential for preventing the scar tissue formation and for promoting nerve regeneration in the adult organisms. Future experiments will focus on the validation of these findings in a critical nerve injury model.

## Evaluation of the vascularization of adipose grafts in the in vivo dorsal skinfold chamber mouse model under normothermic and hyperthermic conditions

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### Introduction

In clinical settings, fat grafting has beneficial effects in augmenting soft tissue. Processes of graft survival and revascularisation, however, remain poorly understood. As previous studies showed improved skin flap survival in pigs after local heat warming, we assessed the thermic impact on revascularisation and fat graft survival in a murine model.

### **Material and methods**

Human fat was transplanted into the Dorsal Skinfold Chamber of control (normothermic) and heat-preconditioned (43°C cage temperature 24h prior to transplantation) SCID mice. Digital images of wound beds and transplants were analysed for functional capillary density, vessel diameter and number of capillaries per region of interest. On day 21 after transplantation, the wound bed tissue was harvested and immunohistochemically stained with antibodies for human and mouse CD31 and Caspase 3.

### **Results and conclusion**

Our data show a tendency towards a delayed angiogenic response in hyperthermic mice as compared to normothermic controls (days 7-10 vs. days 3-5 after transplantation, respectively). Maximal reperfusion was found to occur around day 21 in both groups. At this time point, individual stainings for both human and murine endothelial cells were positive in transplants and wound beds, suggesting the possibility of a shared microvascular network comprised of both graft and host vasculature.

### **Efficacy of OK-432 (Picibanil) in melanoma patients with recurrent seroma formation after lymphatic dissection: the Zurich approach**

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### **Introduction**

Recurrent seroma formation after lymphatic dissection in melanoma patients is a challenging condition and represents the most common complication after inguinal and axillary lymphatic dissection. OK-432 has been shown to prevent seroma formation in extended latissimus dorsi flap donor sites. The aim of this study was to investigate the efficacy of OK-432 in recurrent seroma formation after lymphatic dissection in melanoma patients compared to the repetitive puncture technique.

### **Patients and Methods**

A retrospective cohort study was performed. The first cohort was treated with repetitive percutaneous punctures (n=20). The second cohort received OK-432 sclerotherapy (n=20). End-points were seroma volume reduction over time, duration of treatment, incidence of surgical site infections revisional surgeries.

### **Results**

Mean duration of treatment with OK-432 was 9.4 (+/- 7.2) days and significantly shorter than with repetitive punctures 47.5 (+/- 31.9) days.

## Synergistic effect of growth factors and adipose stem cells enhances neurite outgrowth

Prautsch KM<sup>1,2</sup>, Degrugillier L<sup>1,2</sup>, Schaefer DJ<sup>1,3</sup>, Madduri S<sup>1,2,3</sup>, Kalbermatten DF<sup>1,3</sup>

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Adipose derived stem cells (AdSC) alone are known to enhance axonal regeneration. This in vitro study aimed at investigating the synergistic effect of nerve growth factor (NGF) or vascular endothelial growth factor (VEGF) combined with AdSC on axonal outgrowth, as well as to assess the difference in neurotrophic activity between direct co-culture vs. indirect co-culture of AdSC with dorsal root ganglia (DRG).

In experimental conditions, NGF or VEGF at a concentration of 10ng/ml were added to P2 rat AdSC either at day 0 or at day 3 after splitting the AdSC. At day 3, DRG explants from 10-days old chicken embryos were either co-cultured directly with P2 AdSC, or indirectly in the culture medium taken from P2 AdSC. After 48h of direct or indirect co-culture, the co-cultures were immunostained and analyzed microscopically by measuring the extent of neurite outgrowth and the surface occupied by neurites.

NGF and AdSC in indirect co-cultures with DRG explants showed significant axonal outgrowth. Direct co-cultures of NGF and AdSC with DRG explants resulted in a moderate neurotrophic effect when compared to indirect co-cultures. Significant results were observed for VEGF conditions in direct as well as indirect co-cultures, although less potent than for NGF conditions. When evaluating the area occupied by axons, similar results as for the axonal outgrowth were found.

The analysis confirms the synergistic effect of NGF and AdSC in indirect co-culture on axonal outgrowth in vitro. Direct co-cultures show decreased neurotrophic effect for reasons that are to be investigated. A pilot in vivo study is currently evaluating these findings on a 15 mm sciatic nerve gap model.

## Bioactive nanoparticle formulations promote survival of perforator flaps in a rat model

Lese Ioana<sup>1,2</sup>, Tsai Catherine<sup>2</sup>, Taddeo Adriano<sup>2</sup>, Matter Martin<sup>3</sup>, Hermann Inge<sup>3</sup>, Olariu Radu<sup>1,2</sup>, Constantinescu Mihai<sup>1,2</sup>

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### Introduction

Perforator flaps play an important role in soft tissue reconstruction. Nonetheless, distal flap necrosis is a frequent complication which the medical community is continuously trying to overcome. Bioglass alone or in combination with trace elements such as zinc, strontium and ceria are thought to have anti-inflammatory and neo-angiogenetic properties. The aim of this study was to explore the ability of various nanoparticles to increase flap survival in a rat model.

### Materials and methods

A 9 x 3 cm dorsal flap based on the posterior thigh perforator was raised in 32 Lewis rats. They were divided in 4 groups: I – control, II – Bioglass, III – Bioglass/Ceria and IV – Bioglass/Ceria/Strontium/Zinc. On postoperative day 7, various samples were collected and planimetry and laser Doppler analysis were also performed.

### Results

The survival rate of group IV (77,3%) and II (76%) was significantly higher than group I (69.9%) and III (74%). Laser Doppler analysis also confirmed these results. Moreover, MCP-1 was significantly lower in the flaps` distal part in groups II and IV. While VE-Cadherin didn't record any differences, the expression of CD31 was significantly lower in groups II and IV in immunofluorescence. Histologically, there were significantly more vessels present in group II and III, as well as increased levels of VEGF-A.

### Conclusions

Bioglass nanoparticles, either alone or doped with strontium, zinc and ceria, induce a positive anti-inflammatory and neo-angiogenetic effect in the distal part of a perforator flap, increasing therefore its survival. These first experimental results may prove relevant for the future clinical setting.

## FREE COMMUNICATIONS 2: LOWER LIMB RECONSTRUCTION

(FR 21.09.18 – 11:00 – 12:00, 13:30 – 15:00)

### The use of a tubed pedicle flap for cutaneous coverage of lower extremity wound: an outdated procedure?

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#### Introduction

Chronic wounds of the lower extremity are difficult to treat, especially with an underlying condition of peripheral arterial disease (PAD). Limb salvage is preferably conducted with free tissue transfer. However, when appropriate vessels for anastomosis cannot be found other alternatives must be taken into consideration.

#### Methods

We present the course of treatment of a 66-year-old woman with a pretibial chronic wound. Our patient rejected the amelioration of arterial perfusion through angioplasty or bypass surgery to the leg. We therefore conducted wound coverage in this "single-vessel-leg" with a tubed pedicle flap from the same extremity.

#### Result

The coverage of the wound was established in three separate procedures. The result after six months shows a decent outcome with negligible donor site morbidity.

#### Conclusion

The tubed pedicle flap was first described by Filatov in 1917. In current literature, there is merely one description of this technique in the lower extremity. We state this technique to be a useful and reliable treatment option for defect coverage in patients with PAD. It should therefore be taken into consideration in this patient population.

### A treatment strategy for degloving injuries of the foot

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#### Introduction

Degloving injury is a serious and potentially life-threatening trauma, which often results from industrial or traffic accidents. We present two patients with degloving injuries of the lower limb and our treatment strategy.

### Cases

In a 9-year old boy, the left foot was overrun by a lorry. The soft tissue was fully detached and there were multiple fracture-dislocations. After initial repositioning and K-wire fixation, the soft tissue developed necrosis. After ten days, toes I-V were partially amputated. For definitive defect closure a pedicled Latissimus dorsi flap transfer with split skin graft was performed. After four months the patient was able to mobilize fully weight bearing. Three years later, the foot showed pressure ulcers due to the growing process. These reacted well to non-operative pressure relieving measures. The patient is leading a normal life including sport activities.

In the second case the right forefoot of a 48-year old male was overrun by a forklift. He suffered a degloving injury of the forefoot, metatarsal fractures and an amputation of the second toe. Initially a surgical debridement was performed, followed by soft tissue reconstruction through a Latissimus dorsi flap and split skin graft after six days. After wound healing an orthopedic shoe was applied, which allowed full weight bearing. The therapy showed to be successful, the patient is not restricted in daily life.

### Conclusion

A variety of treatment options are described for degloving injuries of the foot. The appropriate treatment should be decided individually, however in our experience, Latissimus dorsi flap transfer with split skin graft showed good functional and cosmetic results.

## Tri-component chimeric flaps in lower extremity reconstruction

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### Introduction

Complex defects of the lower extremities demand thorough planning of reconstruction: The defect size may be so huge that more than one flap is needed and/or vascular supply can be poor and only one recipient vessel may be available—particularly after Gustillo IIIb/c fractures. Also severe infections or vast tumors can lead to large, occasionally multilocular defects. Chimeric flaps with different tissue components on one common vascular pedicle, which appear to be an option in the described scenarios, were first presented by Hallock in 1991.

### Methods

In the past two years, a few cases with extensive lower leg defects were treated by our department receiving a tri-component chimeric flap of the subscapular system or of the lateral circumflex femoral artery angiosome.

## Results

All cases were saved from limb amputation: the flaps healed uneventfully and good function was achieved.

## Conclusion

In our opinion, notably the true tri-component chimeric flaps represent a valid option in case of vast defects of the lower extremities, as these flaps are large, pliable and adjustable to the different qualities of the defect sites and since only one recipient vessel and hence arterial anastomosis is needed. Few cases of true tri-component chimeric flaps have been published so far.

## Back to the roots: the SCIP flap in lower extremity reconstruction

*Wishart K. T.<sup>1</sup>, Engels P. E.<sup>1</sup>, Grufman V.<sup>1</sup>, Scaglioni M.<sup>1</sup>, Fritsche E.<sup>1</sup>*

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## Introduction

The groin flap was the first flap to be used as a microvascular free tissue transfer in lower extremity reconstruction in 1972. The anatomical description of the groin flap coincided with the very beginning of clinical microvascular surgery. The advantage of the groin flap was its functionally and aesthetically favorable donor site with a consistency of the vessels being present. With more experience the unfavorable characteristics of the flap got manifested. The pedicle is short, the diameter of the artery is very small, the anatomical variability of the artery is unsteady and on the medial aspect lymph nodes thicken the flap. Therefore the failure rate of this flap was very high in these years. With the subsequent description of other cutaneous and myocutaneous flaps the groin flap was almost entirely abandoned.

Only with the better knowledge of the principals of microsurgery, the development of super-microsurgery and the improvement of accurate instruments the SCIP-flap has a renaissance and is used more and more in centers for reconstruction of defects and through the better preoperative imaging with CT angiography and the monitoring with ICG this flap can be harvested safer.

## Methods

We present our clinical results with this flap in reconstruction of the lower extremity for the coverage of defects and present tips and tricks in harvesting and anastomosing this flap. Furthermore we present a case of a chimeric SCIP-flap with two independent skin islands that has not been described in literature so far.

## Subtotal talus reconstruction with free medial femoral condyle flap after oncologic resection

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### Introduction

The adage “replace same with same” governs reconstructive surgery in order to restore form and function. Talus reconstruction is challenging given the complex geometry, perfusion and constant weight bearing pressure. We present a case of oncological subtotal talus reconstruction inspired by posttraumatic reconstructions using a free corticoperiosteal medial femoral condyle flap.

### Patient presentation

A 61-year-old male presented with pain in the right ankle. Diagnostics confirmed a pathological fracture caused by a giant cell tumor of the talus. The patient underwent open tumorectomy and reconstruction with an ipsilateral free medial femoral condyle flap and cancellous bone graft. The femoral defect was filled with a cancellous bone allograft (Tutoplast™) and stabilized with a LISS-Plate. Postoperative care comprised of immobilization in a cast for 3 months with progressive weight bearing. Radiographs were performed monthly until full weight bearing. No complications were noted.

### Discussion

In recent literature, talus reconstruction with free medial femoral condyle was described after trauma. The geometry, size and vascularity of the flap prove useful towards anatomical reconstruction. The size of the flap used motivated prophylactic femur osteosynthesis in order to avoid donor site morbidity.

### Conclusions

To the best of our knowledge, this is the first description of talus reconstruction after tumorectomy using a free medial femoral condyle flap. Clinical and radiographic evaluation show progressive osteointegration and no pain after reaching full weight bearing gait. This reconstructive option is a beneficial addition in oncologic talus reconstruction.

## Free double barrel fibula flap for complex arthrodesis in post-infectious bony defects of the ankle

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### Introduction

Transarticular bony defects of the ankle, mostly after severe infections, present a great challenge for reconstructive orthopedic and plastic surgery. The aim of this report is to describe the free double barrel fibula flap as an option for complex ankle arthrodesis.

### Clinical cases

The two patients presented underwent complex ankle arthrodesis with a free double barrel fibula flap because of a large transarticular bony defects due to severe infection of the ankle and several surgeries:

#### Case 1

A 62-year old patient with an open talus fracture dislocation was initially treated by a free ALT flap coverage 1 month after his accident. The postoperative course was complicated by severe infection leading to a large bony defect after multiple interdisciplinary revision surgeries, extensive antibiotic therapy and removal of the talus. Ankle arthrodesis was achieved with a free double barrel fibula flap.

#### Case 2

A 53-year old patient suffered from an implant-associated infection following failed ankle arthrodesis due to ankle osteoarthritis. A large bony defect remained after a series of interdisciplinary revision surgeries including spacer exchange, ALT flap for wound closure and extensive antibiotic therapy. Ankle arthrodesis was performed with a free double barrel fibula flap.

In both cases, postoperative imaging confirmed a progressive consolidation at the arthrodesis site with a well-integrated fibula flap.

### Conclusion

The free double barrel fibula flap proved to be a safe and viable option to perform ankle arthrodesis in the two complex bony ankle defects.

## Decompression of the lateral sural cutaneous nerve to relief chronic exertional lower leg pain after more than 30 years

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### Introduction

The lateral sural cutaneous nerve (LSCN) supplies the upper lateral aspect of the lower limb below the knee. Isolated LSCN entrapment has been reported rarely.

### Case report

A 65-year old male patient suffered from severe bilateral exertional lower leg pain since more than 30 years, mostly during jogging. Stabbing and burning pain was localized at his lateral calf with irradiation into his lateral foot. A positive Tinel sign was detected over the LSCN, motor function and reflexes were normal. Multiple conservative treatments and bilateral surgical fasciotomies failed, yet 2 test blocks of the LSCN resolved complaints temporarily.

### Results

The LSCN derived from the common peroneal nerve bilaterally. It was decompressed by cutting a tight fibrous band, seemingly an extension of the deep fascia extending into the gastrocnemius and peroneus longus muscle. The patient has been completely painfree since 1 month postoperatively.

### Discussion

Only 4 isolated LSCN entrapments were published in modern literature to date, only 2 progressed to operation and this may be the first bilateral entrapment successfully treated by surgery. Diagnosis may be difficult due to variable innervation patterns and the obscurity of this nerve which may be compressed by local tumors, tendons or fascial structures.

### Conclusion

The LSCN is a little-known cutaneous sensory nerve with high anatomic variability. Mononeuropathy of this nerve should be considered in pure sensory pain symptoms at the lateral calf and may be more common than its rare description in literature. Surgical neurolysis may resolve pain and paraesthesia if conservative measures have failed.

## Botulinum toxin augmented free gracilis flap and local peroneus brevis flap for chronic ulcers in a patient with systemic sclerosis and secondary Raynaud syndrome: a case report

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### Introduction

Raynaud syndrome is a disorder with abnormal vasoconstriction of the distal limb and cutaneous vessels in reaction to cold, stress or other stimuli. The underlying cause in our patient is systemic sclerosis, known as systemic illness of the connective tissue with fibrosis of the skin and inner organs as well as obliterating angiopathy. Several treatment methods had failed, resulting in the need for a complication-susceptible free tissue transfer. Since botulinum toxin effects autonomic and adrenergic nerves, the influence on vasomotor tone could potentially improve vascular patency.

The aim was to achieve wound closure with a microvascular free and local flap reconstruction, preventing flap loss with the help of botulinum toxin.

### Materials and methods

In a 58 year old female patient with Raynaud syndrome due to systemic sclerosis and subsequent chronic ulcers of the lower limbs, we performed a free gracilis and peroneus brevis flap. The donor and recipient site were pretreated with botulinum toxin before surgery in order to prevent postoperative thromboembolic or vasospastic complications. Monitoring, anticoagulation and follow-up were identical to healthy patients.

**Results**

Long-term wound closure was achieved with a free gracilis and peroneus brevis flap after preoperative treatment with botulinum toxin.

**Conclusion**

This report describes the first successful case of a free gracilis flap in a patient with systemic sclerosis and Raynaud syndrome after influencing the microvascular environment with botulinum toxin. Periarterial sympathectomy may prevent complications in high-risk patients, encouraging free and local flap reconstruction despite the underlying disease.

**Microsurgical flap reconstruction of the lower leg in a 115 year-old patient under regional anesthesia: case report and review of the literature**

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**Introduction**

Live expectancy and experience in microsurgical reconstruction have rapidly increased in the last two decades. Depending on the appropriate indication, it is possible to perform individualized, safe and successful microsurgical reconstructions, almost in every patient, even if aged over 100 years.

**Material and Methods**

We report on a 115 year-old man with a soft-tissue defect of 12x8cm at his right heel with exposed bone and biopsies showing chronic osteomyelitis of the calcaneus. A microsurgical reconstruction using a free gracilis-flap and split-skin grafting from the right medial thigh was performed in regional anesthesia, to minimize the perioperative risk.

**Results**

Stable soft tissue coverage was achieved. The postoperative recovery was uneventful and the patient resumed his preoperative activity level.

**Conclusion**

We conclude that despite the medical challenges of performing complex reconstruction in elderly patients, free tissue should be considered as a valuable option for selected patients, even if aged over 100 years. If general anesthesia seems a major risk, local or regional anesthesia can safely be used in this population, which is certain to grow in future.

## Early and delayed flap coverage in the lower extremity: a retrospective single-center review of current practice

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### Introduction

There is a controversy about the ideal moment to cover wounds in the need of soft tissue coverage. In our unit we adhere to a treatment concept which divides the approach into early vs. delayed flap coverage, according to the time of wound persistence until definitive flap closure.

The etiology and primary debridement of the wound affects whether an early or a delayed tissue coverage is favored. Clear objective decision criteria to indicate early or delayed wound coverage are controversially discussed in the literature. This study aimed at outcome-evaluation of our treatment concept.

### Methods

We performed a retrospective data analysis including all cases of patients with an extensive soft tissue defect of the lower extremity due to trauma or infection between 01.01.2013 and 31.12.2017 undergoing early or delayed flap coverage.

### Results

A total of 226 patients could be included in our analysis. Trauma was the leading cause for defect accounting for 65% of the cases. Early coverage was performed in 12% of all Trauma patients.

Free Flap coverage was performed in 77 (53%) of post traumatic cases. In this with a number of 53 Gracilis flap was the most common free flap. Propeller flaps were the most common local flaps (19) among all evaluated cases.

Major complications (surgical revision) were observed in 52 cases (22%), however the majority of cases (85%) healed without any reconstructive failures.

### Conclusion

A clear treatment concept differentiating between early and delayed flap coverage in the lower extremity leads to consistent results and ultimately high rates of reconstructive success.

## Evolution of lower limb reconstruction: the Geneva experience over the past 25 years

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### Introduction

Lower limb defects resulting from acute or chronic trauma, oncologic resections, or infections remain a challenge in reconstructive surgery. For many years, local or regional flaps were the gold standard for the management of such cases. However, the advancement of microsurgical techniques has opened new horizons widening the surgical options.

### Material and methods

Retrospectively the medical charts and photos of 500 patients with lower limb defects reconstructed by flaps techniques from 1993 to 2017 were reviewed. The different types of flaps were assessed as well as their respective complication rate. The decision making evolution of the flap choice was analyzed.

### Results

Since year 2000, we note a dramatic increase of free flap indications. 400 patients were eligible for the study, with 250 loco-regional and 150 free flaps. Complications were wound dehiscence and partial necrosis for pedicle flap whereas free flap ischemia induced pedicle revision and in some cases removal flap for thrombosis. Mean overall complications and healing time were lower in free flap group.

### Conclusion

Loco-regional flaps remain a good option in selective cases but free flaps became the work-horse for reconstruction options. They can offer safe reconstruction of large defects and avoid sometimes amputation. In severe trauma patients, multidisciplinary approach is of paramount importance.

## Free-flap for lower extremity reconstruction: Lausanne experience

Müller Camillo<sup>1</sup>, Lucas Dominique<sup>1</sup>, Mahmoud Ramzy<sup>1</sup>, Rotunno Teresa<sup>1</sup>, Raffoul Wassim<sup>1</sup>

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### Introduction

Free-flap outcomes in lower extremity reconstruction carry the lowest success rates compared with other anatomical sites. It is therefore important to analyze complications and to compare the outcomes of pedicled and free flaps.

### Methods

We performed a cohort study and retrospectively analyzed all free flap lower limb reconstruction. Data includes all flaps from 01.01.2011 to 31.03.2017. Exclusion criteria were flaps with a follow-up shorter than 30 days. We assessed preoperative parameters like comorbidities, age of the patient and etiology of the tissue defect. Perioperative parameters like size of the tissue defect, type of free flap and anastomoses chosen, microbiological analysis of biopsies as well as postoperative parameters. Further, we analyzed the different types and severities of complications and correlated patient related parameters to overall flap complication rates.

### Results

Our center managed 702 flap reconstructions, of which 69 patients underwent lower extremity reconstruction by means of a pedicled flap with a follow up of at least 30 days. This cohort suffered from 14 complications. On the other hand, 43 patient underwent lower extremity reconstruction by means of a free flap with 14 complications reaching from wound dehiscence to two total free flap failure. Due to the small sample.

### Free flap reconstruction of lower extremity soft tissue defects: a 12-year single-center retrospective evaluation

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### Introduction

Reconstruction of the lower extremity is an essential part of plastic surgery and focuses on wound coverage and functional recovery. The use of free flaps has become a reliable approach. The aim of this study was to analyse the data in free flap procedures in reconstruction of the lower extremity soft tissue defects performed during a 12-year period at our institution.

### Materials and methods

Data from 315 patients undergoing free flap reconstruction for lower extremity soft tissue defects were retrospectively analyzed (age, sex, smoking status, comorbidities, defect etiology, defect location, flap type and complications). Univariate and multivariate statistical analysis were performed to determine the impact of each factor on postoperative complications.

### Results

315 patients were included in this study. The most frequent etiology was trauma (59.1%), followed by infection (10,5%) and cancer (5,7%).The antero-lateral thigh flap was performed in 39.1% of the cases, followed by the gracilis flap (33,3%), latissimus dorsi flap (17.5%) and scapula flap (5.7%).The overall flap survival rate was 95.9%. Flap revisions were necessary in 28.9% of cases, with distal partial flap necrosis as the most frequent indication (11.4%), followed by infection (9.2%), and hematoma (6.9%).

## Conclusions

Microvascular free tissue transfer for soft tissue lower extremity defects has proven to be reliable and safe with a low flap failure rate even in complex situations and despite a high revision rate.

## Bone reconstruction with vascularized bone flaps in the lower extremity: a critical, retrospective, single-center review.

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## Introduction

Vascularized bone flaps for long bone defect reconstructions in the lower extremity are among the most complex orthopedic reconstructions, however a number of large case series have reported excellent long-term outcomes. There is however some uncertainty regarding the complication profile in these highly demanding surgeries. The aim of our investigation was to retrospectively assess our center's experience in lower extremity vascularized bone reconstruction, focusing on the analysis of outcomes and complications.

## Patients and methods

We performed a retrospective chart review of all vascularized bone reconstructions of the lower extremity performed between 2006 and 2017 and analyzed demographic, surgical and follow-up data. Reconstructive success was defined as complete bone healing under full unrestricted mobility and complications were specifically analyzed regarding their impact on bone healing.

## Results

A total of 27 patients could be included in the analysis. The fibular free flap was most frequently used (81% of cases). Tumor and trauma were the most frequent etiologies for the defects (40% and 37% respectively). Reconstructive success was achieved in 89% of cases, however in 40% of these successful reconstructions a secondary bone healing related procedure was necessary.

## Conclusions

Vascularized bone transfer is a rewarding procedure for reconstruction of bone defects in the lower extremity despite the high rate of secondary bone procedures required to achieve full unrestricted mobility.

## Vascular risk modifiers and vascular status as a predictive value in the success of free flaps to the lower extremity

Mahmoud Ramzy<sup>1</sup>, Muller Camillo<sup>1</sup>, Lucas Dominique<sup>1</sup>, Rotunno Teresa<sup>1</sup>, Raffoul Wassim<sup>1</sup>

<sup>1</sup> Hand and plastic surgery department, CHUV, UNIL; Lausanne

### Introduction

Vascular patency in the recipient site is the sine qua non condition to consider free flap defect coverage. Therefore, we decided to correlate vascular risk modifiers to vascular study results and to plot those against free flap success rate.

### Methods

We performed a single center study analyzing all the lower limb free flap reconstructions. Our data included the patients operated between 01.01.2011 and 31.03.2017 who had a lower limb angiography before the operation. Exclusion criteria were a follow up of less than 30 days. We assessed the presence of partial or total major vascular axis occlusion and compared their frequencies. Then we calculated the incidence of each risk modifier (gender, age, smoking and diabetes mellitus) and correlated those to the occlusion rate. Following, we correlated the presence of any territory occlusion to the success rate of the flap.

### Results

During this period, 43 free flaps fit our inclusion criteria. 14 flaps suffered from complications varying from wound dehiscence to total flap loss. The rate of vascular occlusion in our series was not correlated to gender, age nor diabetes. Smoking was higher in the population which had one or more occlusions. Furthermore, the occlusion in a vessel that is not responsible of feeding the flap did not raise the rate of complications.

### Conclusion

We recommend not to consider diabetes, age or male gender a relative contra-indication to free flaps. On the other hand, smoking patients to whom the operation is irreplaceable should be informed that they have a higher risk of complications. Further, the results emphasized the importance of arteriography in the choice of the recipient vessel.

## Patient height, weight, BMI and age as predictors of gracilis muscle free-flap mass in lower extremity reconstruction

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## Background

Gracilis muscle flap is commonly used for the reconstruction of defects of the lower extremities. Preoperative evaluation of gracilis muscle dimension is a key aspect in surgical planning. This study aimed to determine whether patient height, weight, body mass index (BMI) and age are reliable proxy measurements of the mass of gracilis muscle flap.

## Patients and methods

Twenty-two patients treated for lower extremity reconstruction with free gracilis flap between December 2010 and December 2014 were considered. The relationships between the mass of gracilis muscle and patient height, weight, BMI and age were assessed with Pearson's product moment correlation coefficient. Defect size, mass of gracilis muscle resected and surgical outcomes were also evaluated.

## Results

There was a moderate correlation between the mass of the gracilis muscle and patient height ( $r=0.4$ ), weight ( $r=0.4$ ), and BMI ( $r=0.3$ ), and moderate inverse correlation with age ( $r=-0.04$ ). Lower extremities defects ranged in size from  $3\times 4$  cm ( $12$  cm<sup>2</sup>) to  $26\times 11$  cm ( $286$  cm<sup>2</sup>) with a mean of  $81.6$  cm<sup>2</sup>. All defects were reconstructed with the gracilis muscle, which required a resection ranging between  $3$  g and  $105$  g (mean= $37.4$  g) to adapt the flap to the recipient site. Complete flap loss was observed in one case.

## Conclusion

In our series, the mass of the gracilis muscle flap was predictable in relation to height, weight, BMI, and age, which can be considered reliable proxy measurements. This will contribute to adequate flap selection for microsurgical reconstruction of lower extremity defects.

## Pedicle perforator-based flaps for lower extremity reconstruction: a single surgeon experience

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## Introduction

Reconstruction of the lower extremity is challenging, and local perforator flaps have emerged as valuable options for small to medium size defect coverage. Here, we present a single surgeon experience using local perforator flaps in different areas of the lower extremity, outcomes and complications were reported.

### **Patients and methods**

A total of 64 local perforator flaps were used in 62 patients (38 males and 24 females, aged 16 to 89 years). The etiologies included 32 tumor, 10 motor vehicle accidents, 13 chronic wounds, 9 donor site defects after free flap harvesting. The defects were localized to the medial thigh(6), lateral thigh(4), mid-leg(32), ankle(2), calcaneus(5), and plantar foot(15). Perforator flaps based on the lateral circumflex femoral artery(LCFA), profunda femoris artery(PFA), peroneal artery(PA), posterior tibial artery(PTA), anterior tibial artery(ATA) and medial plantar artery (MPA) were employed. In all cases, the flap was harvested as a perforator-based island flap, while the mechanism of flap transfer varied between V-Y advancement(11), interpolation(14), or different degrees of axial pivoting around the skeletonized perforator (propeller flap design)(39).

### **Results**

The flap dimensions ranged from 3×4 cm to 16×5 cm. All flaps survived, 2 flaps experienced distal congestion, which was treated conservatively. Follow-up observations were conducted for 3 to 12 months, and all patients had good functional recovery with satisfactory cosmetic results.

### **Conclusion**

When characteristics of the defect are suitable for treatment with a perforator-based local flap, this technique should be considered as one of reasonable options of reconstruction.

## **Treatment outcome of infected total knee arthroplasty with severe soft-tissue damage**

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### **Introduction**

Periprosthetic Implant-associated joint infections (PJI) are a feared complication after total knee arthroplasty (TKA). The management of periprosthetic soft-tissue defects requires rapid assessment of the infection and consequent application of a valid treatment algorithm. All infected TKA at the University Hospital Basel between 2000 and 2018 in need for a combined ortho-plastic procedure were analysed.

### **Material and methods**

All patient charts from 2000 to 2018 were scrutinized for the keywords 'implant', 'prosthesis', 'infection' and 'flap'. Furthermore, all charts were screened for orthopaedic, plastic surgical, infectiological and patient-specific parameters.

## Results

175 patients suffered from an infected TKA of which 36 needed a total of 44 plastic-surgical soft-tissue reconstruction procedures. Six flap complications were seen. 9 Patients had a debridement, antibiotics and implant retention procedure due to early wound breakdown, 8 had a one-stage and 21 a two-stage procedure. Six patients ended in knee arthrodesis, one in above knee amputation and one with knee pseudarthrosis after implant removal.

## Conclusion

(i) immediate plastic-surgical reconstruction of a periprosthetic soft-tissue defect can prevent the exchange of the prosthesis. (ii) in case of severely damaged periprosthetic soft tissue, removal of the prosthesis, insertion of a spacer or fixateur externe is indicated followed by soft-tissue reconstruction. At the earliest, re-implantation of the prosthesis is performed 6-8 weeks later. (iii) possibly critical soft-tissue should be replaced by well vascularized soft-tissue before implantation of the prosthesis.

## The anatomical reliability of the thin superficial circumflex Iliac perforator-flap in the western population

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## Introduction

In order to achieve a satisfactory functional and aesthetic result a thin skin flap is often required in surgical reconstruction of various body regions. Perforator flaps based on either the superficial or deep branch of the superficial circumflex iliac artery (SCIP-Flaps) have been used for this purpose but have not yet gained broad acceptance due to variability in their vascular anatomy. Recently the superficial plane has been established as a new technique of elevation, providing an even thinner flap from this appealing donor site.

## Material and methods

Wide areas were harvested subfascially from the groin of Thiel-fixated cadavers in order to ensure the inclusion of all relevant vessels. Both deep and superficial branches of the superficial circumflex iliac artery were carefully dissected and individually injected with µAngiofil. After CT-imaging the flaps were raised on the superficial plane, perforators were marked and the flaps subsequently rescanned. High-resolution images of regions of interest were taken using micro-CT.

## Results

12 flaps have been harvested and analyzed. Both deep and superficial branches provide on average 3.5 perforators per branch. Detailed maps of the perfused area, locations of perforators and different layer thicknesses allow for a more differentiated approach to planning of SCIP-flaps.

## Conclusion

Although significant anatomical variations have been noted, main vessel perforators in the superficial plane appear constant and well-assignable. Decisions about the plane of elevation should not only be based on the desired thickness but also take into account location and size of the planned flap.

## Arterio-venous loops enable free tissue transfer to lower limbs with otherwise inadequate local donor and recipient vessels

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## Background

Free flaps to lower extremities with damaged or diseased vessels is a challenge to the reconstructive surgeon. We describe our case series using an arterio-venous loop and defect reconstruction in a one-stage or two-stage procedure.

## Patients and methods

Between June 2016 and May 2018, six consecutive patients (mean age 72 years, range 54-84 years, four male and two female patients) with a soft-tissue defect on the lower extremity with poor local donor or recipient vessels were included. In one patient defect reconstruction was performed in a one-stage procedure, whereas in the remaining patients defect reconstruction was performed two weeks later. In four cases free gracilis flaps were used, whereas in the other two patients a free latissimus dorsi flap or chimeric scapular flap was used, respectively. Indocyanine green (ICG)-enhanced fluorescence was applied during surgery to assess flap perfusion.

## Results

The mean loop length was 32cm (range 12-60cm). In one patient partial loss of the free latissimus dorsi flap occurred, requiring debridement and reconstruction using a permanent skin substitute (Integra) and skin graft three months later. One patient died three weeks after a free gracilis flap due to pneumonia. After a mean follow-up of 8.8 months (range 1-23 months) there was stable soft tissue coverage in the remaining patients. ICG-enhanced fluorescence was useful in assessing arterial perfusion of flaps during surgery.

## Conclusions

We successfully reconstructed lower extremity defects with poor local donor and recipient vessels using arterio-venous loops. ICG-enhanced fluorescence was beneficial for intraoperative perfusion assessment.

## Propeller flap reconstruction of the lower leg in the polymorbid patient: is the complication rate acceptable?

Papanikolaou A<sup>1</sup>, Lese J<sup>1</sup>, Leckenby J<sup>1</sup>, Rothenberger J<sup>1</sup>, Constantinescu M<sup>1</sup>, Olariu R<sup>1</sup>

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## Purpose

Propeller flaps are considered a possible alternative to free flap transfer in lower leg defect coverage. Especially in polymorbid patients, complication rates of free flap transfer are higher and the often long, complex surgery leads to increased morbidity. In these cases, the propeller flap may be a valuable alternative, however the complication rates and the outcome of this technique especially in polymorbid patients are unclear.

## Patients and Methods

All patients receiving defect coverage with a propeller flap in the lower leg in our unit between 01.05.2014 and 30.09.2016 were prospectively included and demographic, pathological and follow-up data was recorded. Patients were divided into two groups: polymorbid and non-polymorbid.

## Results

A total of 17 patients were treated with a propeller flap in the lower leg during observation time, 6 of these were polymorbid. All patients in this group had a postoperative complication, however only one complication required revision surgery. In the non-polymorbid group, 2 of 11 patients had a postoperative complication, both requiring surgical treatment. Hospitalisation time did not differ between groups, however the time to complete wound healing was significantly longer for polymorbid patients.

### **Conclusion**

Propeller flap reconstruction for lower leg defects in polymorbid patients has a significantly higher overall minor complication rate, however this does not lead to increased number of surgical revisions or increased hospitalisation time when compared to the non-polymorbid control group. The propeller flap reconstruction in the lower leg appears appropriate in polymorbid patients after careful preoperative assessment.

### **Comparison gracilis versus anterolateral thigh flap in microsurgical lower limb reconstruction: is there still a place for the gracilis flap?**

*Lucas Dominique<sup>1</sup>, Muller Camillo<sup>1</sup>, Mahmoud Ramzy<sup>1</sup>, Rotunno Teresa<sup>1</sup>, Raffoul Wassim<sup>1</sup>*

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### **Introduction**

Free tissue transfers are routinely performed for lower limb reconstruction. This study is comparing microsurgical reconstruction of the lower limb using antero-lateral thigh- (ALT) or gracilis (GRA) flaps in CHUV.

### **Methods**

33 patients underwent 34 free flaps: ALT- (24) or GRA (10) for lower limb defect reconstruction after trauma, infection or malignancies at our institution (2011-2016). Bedsores and perineum reconstruction cases were excluded. All cases were retrospectively reviewed for patients' demographics, perioperative details, surgical complications, and overall flap survival, divided into two groups ALT versus GRA.

### **Results**

No significant difference existed between the two groups regarding preoperative comorbidities, operative time and hospital length of stay. However, a significant difference was found concerning revision surgery rates and total as well as partial flap loss, in favor of ALT.

### **Conclusion**

We found no advantage for GRA compared to ALT regarding surgery duration and hospital length of stay for lower limb reconstruction, but need for revision surgery or complications rates was lower in ALT group. We will detail and analyze post-operative complications. Although our sample was small, we are convinced that ALT can replace gracilis for numerous indications in the lower limb reconstruction. ALT can be harvested as fasciocutaneous flap for thin flap, muscular, musculocutaneous or composite flap with tensor fasciae latae for tendon repair. Moreover, post-operative surveillance is more simple and reliable for ALT, because its skin paddle can be visually monitored. However, GRA flap is a simpler solution for small size defects.

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## FREE COMMUNICATIONS 3: RECONSTRUCTIVE RHINOPLASTY

(FR 21.09.18 – 16:00 – 16:45)

### Rintala and converse flap for the reconstruction of nasal tip defects

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#### Introduction

The nose is one of the most common sites for nonmelanotic skin cancers and multiple options exist to restore functional and aesthetic integrity. Reconstructing cutaneous and soft tissue defects can be challenging for plastic surgeons. We present our experience in surgical treatment using Rintala and Converse flap, also a review from different flaps to cover this area.

#### Material and methods

We presented a retrospective study in 5 patients (4 Rintala flaps and 1 Converse flap) with nose skin cancer. The operation was done under local or general anesthesia considering the size of the defect, type of histologie and the amount of residual tissue.

#### Results

After tumor free margins, all defects were covered with Rintala or Converse flap. The discussion will focus on our experience and review of the current literature for reconstruction of nasal tip defects that require different types of reconstruction including Rintala flap, Converse flap, Washio flap, Orticochea flap, Galvao flap and Barsky flap.

#### Conclusion

Reconstructing cutaneous and soft tissue defects of the tip of the nose can be a challenge depending type, localization, size, and surgeon's experience. The most important factor is the complete oncologic resection using the subunit nose anatomy in order to achieve the best possible results. Rintala and Converse flaps are still a good alternative to cover nasal tip defects.

### Outcome of nasal tip reconstruction using frontonasal flaps compared to other local and regional flaps

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#### Introduction

The frontonasal flap is frequently used in nasal tip reconstruction. However, potential drawbacks are contour deformities, tip and alar retraction and scars that do not respect nasal subunits. The outcome of nasal tip reconstruction using frontonasal flaps was compared to other flaps.

### **Material and methods**

Consecutive nasal tip reconstructions using different flaps performed by a single surgeon during a 6-year period (2009-2015) were reviewed for flap type, defect size, comorbidities, complications and secondary surgery. Digital photographs were obtained in standard projections before surgery and at 6 months follow-up. Aesthetic outcome was evaluated by 3 independent observers considering nasal contour, symmetry, scar formation and skin color match.

### **Results**

57 nasal tip reconstructions were performed with 29 nasolabial flaps (group I) and 28 other flaps (group II) including 11 paramedian forehead flaps, 11 Rintala flaps and 6 bilobed flaps. Defect size was comparable in reconstructions with frontonasal and Rintala flaps, smaller in bilobed flaps and larger in forehead flaps. Comorbidities were evenly distributed between groups with no impact on outcome. Complication rates were similar between groups I and II. Secondary surgery was performed in 54 percent of cases in group II and 17 percent of cases in group I. When corrected for planned secondary surgery in two-stage forehead flaps, the incidence of secondary corrective surgery was similar in both groups. Aesthetic outcomes were rated slightly better in group I than group II.

### **Conclusion**

The frontonasal flap performs favorable in reconstruction of the nasal tip compared to other local and regional flaps.

## **Single-stage reconstruction of the nasal tip: the cascade flap revisited**

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### **Introduction**

Reconstruction of the lower dorsum of the nose and especially the tip can be challenging. One option for nasal tip reconstruction is the cascade flap. We want to demonstrate and discuss the advantages and disadvantages of this flap and our experience with it in selected cases.

### **Methods**

The cascade flap was originally described by Emmett in 1991. Essentially it is a two-flap repair of the nasal tip and/or lower nasal dorsum. The first flap is a nasal bridge flap transposed down over the nasal tip while the second flap, a lower forehead or glabella flap is hinged to the upper dorsum of the nose. Both flaps are random pattern myocutaneous flaps. It is possible to use the cascade flap design in combination with nasolabial or cheek flaps, nasal tip cartilage reconstruction with composite grafts has been described too.

## Results

We present a case series of 11 patients treated with the cascade flap at our department. All patients presented a nasal soft tissue defect after removal of a malignant skin tumor. There were no perioperative complications and follow-up was without incident.

## Conclusion

Patient selection and defect assessment is important when considering this flap for repair. The ideal defect is typically too large to be closed with a bilobed flap or other local flaps but not extending into the subunits of the soft triangle, the columella or the ala. An even inset of the flap is essential and it is important to avoid lifting the nasal tip. In conclusion, the cascade flap is a feasible and fairly easy method for soft tissue reconstruction of the nasal tip especially in older patients. This flap should be considered and compared to other techniques more frequently.

## Nasal reconstruction in noma patients

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## Introduction

Large centofacial and especially nasal destruction has dramatic functional and social consequences for patients. Partial or total destruction of the nose often occurs in survivors of noma disease as sequela after large necrosis. We report our surgical strategy for total nasal reconstruction and long-term outcome.

## Patients and methods

This retrospective study includes a review of the medical charts and photographs of 30 patients with total destruction of the nose due to noma sequelae, operated between 1993 and 2016. The different surgical steps were assessed as well as complication and reoperation rate.

## Results

Mean age at first surgery was 15.2 years (range, 4-37 years). Surgery was adapted to the defect and included soft tissue reconstruction of the midface by free flaps 8 patients and 10 patients with bony reconstruction by a vascularized calvarium flap. Nasal reconstruction included frontal skin expansion for all patients and 0-2 procedures for delay of hinge flaps. Bony framework was reconstructed by rib grafts or calvarial bone graft. Surgery was performed after age 12 years in 25 patients. Infections occurred in 7 patients. Secondary reconstructions were performed in 5 patients. Two of them had their first reconstruction before age 12 years. Follow-up ranged between 2 and 20 years. Aesthetic results were mostly satisfying and allowing social integration.

### **Conclusion**

A solid reconstruction of the lining is of paramount importance to prevent infection in this challenging reconstruction. Nasal reconstruction should be postponed to the end of facial growth. The quality of nasal reconstruction is of great importance in complex facial reconstruction.

### **Microvascular reconstruction of large alar defects with free composite helical rim grafts: aesthetic challenges and refinements**

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### **Introduction**

Large full thickness alar defects remain a challenge for reconstructive surgeons. Different reconstructive options such as locoregional flaps, non-vascularised and vascularised free composite grafts are available and they all have their valuable place in the reconstructive ladder. Since its first description, a number of reports of free microvascular composite grafts from the pinna for different defects of the lower third of the nose have been published with usually good results and survival rates. Nevertheless, the esthetically pleasing restoration of a smooth contour of the alar rim, avoiding unsightly step-offs at both sides of the graft, recreation of an adequate bow of the alar rim and well-defined subunits remain challenging.

### **Material and method**

We retrospectively reviewed all cases having undergone microvascular reconstruction of large alar defects with free composite helical rim grafts performed by the senior author.

### **Results**

We present our experience gained from a series of six patients with long-term follow-up. These technical refinements aim to respond to the specific technical tasks and to suggest practical solutions to improve the esthetic outcome.

### **Conclusion**

Free composite helical rim graft reconstruction of large alar defects can be a safe and elegant procedure to reconstruct large alar defects in suitable cases. The final esthetic result can be significantly improved by a number of technical refinements at the time of the primary reconstruction. Small secondary procedures can further optimize the esthetic outcome.

## The subcutaneous forehead flap: a simple solution for defect reconstruction around the forehead

Grufman V<sup>1,2</sup>, Scaglioni M<sup>1,2</sup>, Engels P<sup>1,2</sup>, Wishart K<sup>1,2</sup>, Fritsche E<sup>1,2</sup>

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<sup>2</sup> Department of Hand and Plastic Surgery

### Introduction

The forehead flap has been described in ancient history. It is today still seen upon as the gold standard for nasal reconstruction. Naturally it has undergone some development and improvement over time. The two-stage method constitutes a major disadvantage. Converse and Wood-Smith described a subcutaneous forehead island flap in 1963, presenting a single-stage procedure. The flap was tunneled under the glabellar skin and used as coverage for nasal defects. We therefore posed the question: Why not use it for defect coverage in various defects around the forehead?

### Methods

We present 3 cases of defect coverage to the forehead with a subcutaneous forehead flap in a single stage procedure.

### Results

The results postoperatively show a decent outcome with negligible donor site morbidity. In one patient, a minor corrective procedure was performed after two months under local anesthesia.

### Conclusion

In our opinion the forehead flap represents a very versatile flap, highly suitable for defect coverage around the forehead.

## The combined auricular graft: a new technique for mestizo nasal tip surgery

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<sup>2</sup> Escobar MD, Facial Plastic Surgery, Bogota, Colombia

### Background

In literature there is a lack of a single cartilage graft to address problems in projection, rotation and/or definition in mestizo patients that takes into account the characteristics of this population in terms of alar cartilage structure, length and shape.

### **Methods**

A retrospective cohort study of consecutive patients who underwent primary rhinoplasty using the combined auricular graft between January 2015 and June 2017 was performed. The minimum duration of follow-up was 6 months. Main outcomes were nasal tip projection and tip rotation angle.

### **Results**

Among the 61 patients (38 women [62,2%] and 23 men [37,8%], mean age  $29.3 \pm 10.8$  years) the mean differences in projection were statistically significant between T0 and T1, T0 and T2, and T0 and T3 (1.63, 1.39, and 1.32mm, respectively). Thus, 80,9% of the increase in projection that had been achieved at T1 was maintained at T3 ( $p < 0.001$ ). The relapse ratio measured 19,1% (mean difference T1-T3,  $0.31 \pm 0.10$ mm). The mean tip rotation angle at T0 ( $111.69 \pm 3.59^\circ$ ) significantly increased by  $2.37 \pm 3.13^\circ$  (T3,  $114.06 \pm 2.50^\circ$ ,  $p < 0.001$ ).

### **Conclusions**

One single auricular cartilage graft can significantly improve projection and/or rotation by simultaneously addressing structure, length and shape of lower lateral cartilages. Misbalance between the medial and lateral crura is avoided and retraction risks are prevented. Consequently, a more natural, precise and accurate tip position is obtained.

## FREE COMMUNICATIONS 4: MISCELLANEOUS

(SA 22.09.18 – 08:00 – 09:10)

### Managing chronic knee pain using selective denervation guided by high-resolution nerve ultrasound: treatment algorithm and typical clinical cases

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<sup>3</sup> Private Ultrasound Center, Vienna, Austria

<sup>4</sup> Radiology, University Hospital, Basel

#### Background

A considerable group of patients after knee trauma and surgery remains with chronic pain, e.g. up to 20% after total knee arthroplasty (TKA). Potential causes include neuroma or scar traction of sensory branches innervating the knee, mostly from the femoral and saphenous nerve which yet can be detected accurately by high-resolution ultrasound (HRUS). This paper presents results of HRUS-supported knee denervation.

#### Methods

More than 40 selective knee denervations were performed at 2 hospitals of which 4 cases were chosen to demonstrate typical scenarios. All underwent preoperative HRUS-guided nerve blocks, pain levels were determined on a visual analogue scale (vas) from 0 to 10.

#### Case 1

After blunt trauma, chronic knee pain for over 3 years was reduced by a medial knee denervation (vas 8 to 2/10) in a police-officer (62 y). She fully resumed her work and leisure activity as soccer trainer.

#### Case 2

After a fall, a social worker (27 y) had knee chronic pain (8/10) and residual pain of 4/10 remained after saphenous neurectomy. Following further HRUS and additional neurectomy of the medial femoral cutaneous nerve, her pain completely resolved.

#### Case 3

After TKA, a pensioner (66 y) suffered from chronic pain during 7 years until HRUS-guided medial and lateral knee denervation decreased her pain from 7-8 to 1-2/10.

#### Case 4

After 3 previous knee operations, medial and lateral knee denervation markedly reduced chronic knee pain from 8 to 2/10 in a worker (41 y).

### **Conclusion**

Our experience suggests that selective denervation based on HRUS-guided preoperative nerve blocks provides an effective option to decrease chronic knee pain of various origin with success rates of ca. 80%.

### **Posttraumatic enterobacter cloacae infections in upper extremity: a case series**

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<sup>1</sup> *Department of Plastic and Handsurgery, University Hospital Bern*

### **Introduction**

Posttraumatic infection with enterobacter cloacae (EC) as an only pathogen is a rare entity. We retrospectively analyzed a recent accumulation of cases with severe complications, treatment strategy and outcome of posttraumatic EC infection in upper extremity.

### **Methods**

Patient charts for EC infections that were treated from 2008-2017 were reviewed. Trauma, location, injured structures, time from trauma to surgery, pathogens, number of surgical treatment, antimicrobial therapy, complications and outcome were assessed.

### **Results**

In 10 years, 11 patients, 6 of which with isolated EC infection were identified. All patients were male, the age ranged from 29-42 years. Hands were affected in 67% cases, the forearm in 33%. Additional to the soft tissue injury, tendons/muscles, neurovascular structures and fractured bones were involved. Severe cases were surgically treated at the day of trauma, milder cases with a delay of 3 days. The infection presented after 3-120 days after trauma. Infection was successfully controlled with one intervention in 67%. 67% patients developed 1-3 complications with 1-8 subsequent surgeries. There were tendon adhesions, re-ruptures of tendon repairs, nerve scarring and CRPS. All patients had preoperative antimicrobial therapy with amoxicillin/clavulante. The median duration of correct antibiotic treatment with Cefepime/Ciprofloxacin was 30 days (IQR 23-78).

### **Conclusion**

Posttraumatic EC infections in upper extremity are rare but may result in several interventions with a certain loss of hand function. Initial samples at time of trauma to detect EC and thus possible early treatment with the correct antibiotic therapy is recommended.

## Criteria for successful insurance coverage for correction of contour deformities in postbariatric patients: a retrospective single center review

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### Background

A marked increase in bariatric surgery has led to higher numbers of patients with contour deformities after massive weight loss seeking plastic surgical correction. Insurance coverage for these postbariatric interventions is highly subjective and a common set of objective criteria is not established.

### Aim

We aimed to evaluate the factors influencing insurance coverage for postbariatric surgery focusing on finding objective, reproducible criteria

### Methods

A retrospective single center chart review of all patients after bariatric surgery and with redundant skin requesting body contouring surgery from Jan 2013 to Dec 2016 was performed and demographic, bariatric and surgical as well as insurance information was collected. A logistic regression model was used to assess the influence of various factors on successful insurance coverage.

### Results

A total of 116 Patients could be included in our analysis. The average age was 47 years and the female/male ratio was 81 : 19%. Insurance approval for postbariatric body contouring surgery was obtained in only 46 patients (39%). On multivariate analysis no objective patient characteristics were predictive of successful insurance coverage.

### Conclusions

We could not determine any predictive objective criteria for insurance coverage of post-bariatric surgery. It appears that the decisions of insurance companies for this condition are randomly taken. The establishment of adequate criteria for insurance coverage may allow a fair treatment for this growing patient population.

## Kostengutsprache für Abdominoplastik und Mammareduktionsplastik abhängig vom Versicherungsanbieter?

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### **Einleitung**

Bis heute fehlen objektive Kriterien, die eine Kostengutsprache für eine Abdominoplastik bzw. Mammareduktionsplastik garantieren würden. Entsprechend soll in dieser Arbeit untersucht werden anhand welcher Kriterien Kostengutsprachen gewährt werden und, ob sich diese je nach Versicherungsanbieter unterscheiden.

### **Material und Methoden**

Von Januar 2015 bis Mai 2018 haben sich 228 PatientInnen in unserer Sprechstunde für postbariatrische bzw. konturverbessernde Eingriffe vorgestellt. Bei 149 lag ein Krankheitswert vor und ein Antrag auf Kostenübernahme wurde gestellt. Die PatientInnen wurden in Anbetracht der Therapie (Abdominoplastik und Mammareduktionsplastik) in 2 Gruppen aufgeteilt. Wir evaluieren die PatientInnen unter anderem hinsichtlich folgender Parameter: Geschlecht, Alter, BMI (prä-/postbariatrisch), Gewichtsverlust, konservative Therapie, Mammillen-Jugulum-Abstand, reseziertes Gewicht und Krankenversicherer.

### **Ergebnisse**

Von den 137 Gesuchten wurden unter anderem durch die Versicherungen Visana 1/9 (11%), CSS 2/11 (18%), Swica 9/25 (36%), Helsana 9/15 (60%), Sanitas 11/18 (61%) und Concordia 6/7 (85%) akzeptiert. Es konnte in beiden Gruppen ein signifikanter ( $p < 0.05$ ) Zusammenhang zwischen Kostengutsprache und Versicherung festgestellt werden. Zudem konnte eine grosse Effektstärke (Cramers  $V > 0.5$ ) beobachtet werden.

### **Schlussfolgerung**

Anhand unserer Ergebnisse lässt sich eine statistisch signifikante Korrelation zwischen Kostengutsprache und Versicherungsanbieter nachweisen. Die Zugehörigkeit zu einer bestimmten Krankenversicherung sollte keinen Einfluss auf die Genehmigung der Kostenübernahme solcher medizinisch indizierten Korrekturen haben.

## **A comprehensive review on genital lymphoedema surgery: is microsurgery the goal to pursue?**

Guiotto M<sup>1,2</sup>, Bramhall RJ<sup>3</sup>, Raffoul W<sup>1</sup>, Di Summa PG<sup>1</sup>

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### **Introduction**

Genital lymphoedema (GL) surgery can be either palliative or functional. Palliative procedures consist involve excision of the affected tissue and reconstruction by either local flaps or skin grafts. Reconstructive procedures aim to restore lymphatic flow through microsurgical lymphatico-venous anastomoses (LVAs). This systematic analysis of outcomes and complication rates aims to compare outcomes between these surgical treatment options for genital lymphoedema.

## Materials and methods

A comprehensive review of the PubMed database was performed with the following search algorithm: (lymphorrhea OR lymphoedema) AND (genital OR scrotal OR vulvar) AND (microsurgery OR "surgical treatment"), evaluating outcomes and complications after surgical treatment of GL.

## Results

20 studies published between 1980 and 2016 met the inclusion criteria (total 151 patients). Three main surgical treatments for GL were identified. Surgical resection and primary closure or skin graft was the most common procedure (46.4%) with a total complication rate of 10%. Surgical resection and flap reconstruction accounted for 39.1% of the procedures with an overall complication rate of 54.2%. LVA procedures (14.5%) had a total complication rate of 9%.

## Conclusion

This review demonstrates a lack of consensus in both the preoperative assessment and surgical management of GL. Patients receiving excisional procedures tended to be later stage lymphoedema. Patients in the excision and flap reconstruction group seemed to have the highest complication rates. Microsurgical LVAs may represent an alternative approach to genital lymphoedema, either alone or in combination with other procedures.

## Safety of long-term subcutaneous free flap skin banking after skin-sparing mastectomy

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Die Wiederherstellung von Hautdefekten durch Nekrosen oder onkologischen Nachresektionen nach hautsparender Mastektomie im Rahmen einer autologen Brustrekonstruktion stellt für die Plastische Chirurgie immer noch ein grosses Problem dar. Zur Gewährleistung einer einfachen Rekonstruktion ohne weitere Morbidität wurde das skin banking introduziert. In unserer Arbeit stellen wir die aktuell grösste Fallserie dieser Methode vor und untersuchen die Machbarkeit und Sicherheit des langfristigen, subkutanen, in situ Hautbankens auf Lappenplastiken.

Alle Patientinnen mit hautsparender Mastektomie und sofortiger autologer Brustrekonstruktion im Zeitraum Dezember 2009 bis Juni 2013 der Universitätsklinik für Plastische, Rekonstruktive und Ästhetische Chirurgie am Universitätskrankenhaus Innsbruck wurden analysiert.

Insgesamt wurde bei 31 Patientinnen mit 33 freien Lappenplastiken das skin banking Verfahren angewendet. Dabei zeigte sich eine mediane Bankdauer von 7 Tagen mit einer maximalen Dauer von 171 Tagen. Bei 22,5% der Patientinnen wurde die gebankte Haut zur Rekonstruktion darüber entstandener Hautdefekte verwendet. Der Mamillen-Areola-Komplex wurde in 9,6% der Fälle mit der gebankten Haut wiederhergestellt. Mikrobiologische und histologische Untersuchungen der gebankten Haut zeigten weder klinische Infektionen noch maligne Entartungen.

Das langfristige in situ skin banking bei autologen Brustrekonstruktionen nach hautsparenden Mastektomien ist eine sichere und kosteneffektive Methode, um die Wiederherstellung von sekundär entstandenen Hautdefekten zu gewährleisten.

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## Decision between contralateral and ipsilateral DIEP flap harvesting for unilateral breast reconstruction

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### Introduction

Deep inferior epigastric artery perforator flap (DIEP) procedure is a common method for breast reconstruction after mastectomy. For unilateral breast reconstruction, harvesting of the flap can be done contralaterally or ipsilaterally. The aim of this study is to demonstrate a side difference in quality of abdominal skin perfusion from left to right which could have implications on selection of flap harvesting side.

### Methods

We performed an ultrasonographic evaluation of the deep inferior epigastric artery regarding diameter, time averaged mean velocity (TAMV) and volume flow followed by thermography of the abdominal skin after induced hypothermia in 17 healthy female subjects-

### Results

We discovered a side difference between left and right diameter of the deep inferior epigastric artery in each patient (0.2 mm mean difference;  $p=.000$ ). The rewarming process of the abdominal skin was faster (16 out of 17 subjects; 94.1%) (greater area of rewarming after set time) on the side with the greater diameter deep inferior epigastric artery. Equally, TAMV showed significant higher values on the faster rewarming half of the abdominal skin ( $p=.042$ ). Comparable results could be obtained from volume flow ( $p=.067$ ).

**Discussion**

An ultrasonographic examination of both deep inferior epigastric artery can reveal a dominant side of perfusion which is responsible for a faster rewarming of the superficial skin after induced hypothermia. The presented method should be considered to have implications on the decision between ipsilateral or contralateral flap harvesting regarding unilateral breast reconstruction with DIEPflaps to avoid complications like partial flap necrosis.

**Long term functional outcomes and abdominal wall stability after abdominal wall reconstructions using free versus pedicled ALT-VL composite flaps**

*di Summa PG<sup>1</sup>, Watfa W<sup>1</sup>, Bauquis O<sup>1</sup>, Raffoul W<sup>1</sup>, Raussi L<sup>1</sup>*

*<sup>1</sup> Department of Plastic Reconstructive and Aesthetic Surgery, Department of Thoracic Surgery, CHUV, Lausanne, Switzerland*

**Introduction**

Reconstruction of three-dimensional abdominal wall defects by transposition of autologous tissue is the most effective to repair large composite abdominal defects. The use of free versus pedicled composite anterolateral thigh (ALT) + vastus lateralis flap was analyzed.

**Patients and methods**

12 patients underwent abdominal wall reconstruction between May 2003 and June 2017, all presenting three-dimensional abdominal wall defects, not suitable for component release or inlay/outlay mesh reconstruction only, limiting reconstructive possibilities to autologous flap reconstruction. Reconstructions were performed after either tumour resection or surgical debridement involving the rectus abdomini muscle layers. ALT were associated with vastus lateralis (VL) muscle and fascia lata (FL). Volumetric flap analysis on post-operative CT scans was used to assess flap atrophy over time. Operative time, complications, time to complete healing, duration of hospital stay, abdominal wall stability and flap stability in the long term were assessed.

**Results**

All flaps successfully covered the defects. One patient where no mesh was associated with flap surgery, developed hernia recurrence. Flap atrophy was significantly higher in reinnervated free flaps vs pedicled flap but no differences in hospital stay, time to healing and functional outcomes were noticed.

**Conclusions**

Pedicled composite ALT flaps could efficiently cover abdominal wall defects up to the umbilicus level, while free flaps were more suitable for total or supraumbilical defect, with no added morbidity and equal functional outcomes despite flap atrophy. Combination of ALT with mesh should be adopted for the best functional outcomes.

## Differences in aesthetic and functional outcomes between penile skin and rectosigmoidal graft in neovaginoplasty for transgender surgery

Schaffer C<sup>1</sup>, di Summa PG<sup>1</sup>, Watfa W<sup>1</sup>, Krähenbühl S<sup>1</sup>, Raffoul W<sup>1</sup>, Bauquis O<sup>1</sup>

<sup>1</sup> Department of Plastic, Reconstructive and Hand Surgery, Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, Switzerland

### Introduction

The 'traditional' method for vaginoplasty in transgender surgery realised by inversion of peno-scrotal skin into a cavity in the perineum and pelvis creating a neovagina. To overcome some associated disadvantages and complications, the use of a rectosigmoid graft is being preferred over the penile skin inversion. Some patients benefit from a primary sigmoid-neovagina, whereas those who had a previous penile-neovagina can convert to a sigmoid-neovagina. This study aims to compare long-term functional and cosmetic outcomes of two different techniques for neovagina transformation.

### Methods

This is a retrospective survey on 31 transgender patients who underwent neovaginoplasty by the same senior surgeon, between 2007 and 2017. Twenty patients had penile skin neovagina; 8 of them benefited from a secondary sigmoidal conversion. The remaining 3 had a primary sigmoid-neovagina. Patients were evaluated by a questionnaire to assess aesthetic and functional (penetration, orgasm and pain) outcomes. Statistical analysis was used to compare results between groups.

### Results

Our findings showed that the use of a rectosigmoid graft for neovagina creation, whether primarily or after conversion, decreased sexual pain during intercourse and that orgasm was reached more easily, than after penile skin inversion. Both techniques had similar aesthetic outcome, with mostly satisfied patients (no statistical significance).

### Conclusion

This study reports long-term outcomes in transgender surgery using two different techniques for neovagina creation. The use of sigmoid vaginoplasty showed better functional outcomes than penile skin inversion, whereas cosmetic results were similar.

## Chest wall resections and reconstructions: a single center review of 177 cases

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### Introduction

Surgical management of chest wall tumors or infections is challenging as their resection should be complete and the reconstruction should ensure chest wall stability and function.

### Material and methods

We reviewed 177 resections/reconstructions operated in our institution between 2003 and 2018. For all patients, extent of resection, use of prosthetic material and flap coverage were assessed. Surgical complications and hospital morbidity/mortality were recorded.

### Results

Chest wall resection consisted in ribs (64%), sternum (2%), clavicle (2%), rib±sternum±clavicle combined (24%) and soft tissue alone (8%) to manage lung cancer (28%), primary chest wall tumors (30%), breast cancer (14%), metastasis (18%) and chest wall infections (10%). Complete resection of the disease was achieved in 80% of patients. Reconstruction consisted in pedicled muscles (18%), prosthetic material (mesh 24%, osteosynthesis 10%) or combinations (mesh+flap 42%, osteosynthesis+flap 1%, other 5%). Flaps used were latissimus dorsi (82%), pectoralis major (4%) serratus anterior (3%) and others (11%). Postoperative reconstruction morbidity included hematomas (5%), seromas (6%), wound dehiscence (3%), flap ischemia (5%) and deep wound infection (1%) which required re-intervention in 14% of patients. Patient morbidity was pneumonia (20%), arrhythmia (10%), effusion (9%) and pulmonary embolism (2%) while postoperative death occurred in 5 patients (2 cardiac events, 2 septic shocks and 1 reconstruction related massive hemorrhage).

### Conclusion

Chest wall resections/reconstructions are complex surgeries that allow complete disease resection in the majority of patients with moderate morbidity/mortality.

## Hyperbaric oxygen therapy in plastic surgery: from bench to clinic

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Hyperbaric oxygen therapy (HBOT) is a promising method to improve wound repair and tissue recovery in ischemic conditions with many potential applications in plastic surgery. Over the last years we have studied in animal models which type of wound benefits most from HBOT. Based on our findings, we have progressively introduced HBOT in the management of complicated wounds and of postoperative ischemic complications.

### Experimental study

We studied the effect of HBOT on wound repair in four different conditions: nonischemic/ischemic limbs in normoglycemic/hyperglycemic rats.

### Results

Our results show that HBOT significantly increases blood flow and wound repair in ischemia and hyperglycemia, especially when the two conditions are combined (30.9 vs 46.2 days until complete closure).

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## FREE COMMUNICATIONS 5: AESTHETIC RHINOPLASTY

(SA 22.09.18 – 10:30 – 12:00)

### Basics of cartilage grafting and suturing in primary esthetic open rhinoplasties

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The essential cartilage grafting and suturing of easy primary rhinoplasties will be showed step by step in a chronological sequence. The focus is on standards in dorsum and tip refinements to get a save predictibal result in a common rhinoplasty. The outcomes of several clinical examples will be disussed. The goal is to show these save techniques to younger colleagues to get quickly in an operative comfort zone.

### The role of diced cartilage in primary and revision rhinoplasty

*Rezaeian F<sup>1</sup>*

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#### Introduction

In modern rhinoplasty the need for suitable graft material for restoration of the nasal contour has always been a challenge. According to an increasing number of revision rhinoplasties, the problem has even become more challenging. Ideal grafting material includes availability, biocompatibility, minimal donor site morbidity and cost, as well as low risk of extrusion or infection. Autografts, including bone and cartilage, are considered the gold standard. In this review of several cases the author shows his concept for restoration of nasal contour using specially prepared diced cartilage.

#### Methods

Cartilage harvested from the septum, ear or rib is cut, not crushed bruised or morselized, to small pieces less than 0.5mm in size using a dermatome blade, ensuring viability of the chondrocytes. Using a syringe it can be applied to the nose for restoration. Depending on the composition, there are three possible combinations: DC (diced cartilage) only, DC covered with fascia (DC + F), and DC-F (fascia pocket filled with DC).

#### Results

Several cases are reviewed to demonstrate successful restoration of the nose using different combinations of diced cartilage as described above.

### **Conclusion**

DC seems to be an interesting option for nasal restoration, however overgrafting should be avoided due to a lack of postoperative absorption. Nevertheless, detailed preoperative evaluation and clinical judgment are the most important to determine the best material required for correction of nasal dorsal deformities. In this regard, DC can be thought of as a “permanent autogenous filler” for limited concealment. However, it is not a substitute for structural grafting in major cases.

### **Psychological aspects in rhinoplasty patients**

*Patricia Roggero*

*Lausanne*

The nose represents an important somatic aspect of the personality which plays an important role in self esteem. The operation of the nose, in the middle of the face, has always been considered a difficult operation for plastic surgeons. This requires a management of the patient at both somatic and psychological levels as well before, during and after the operation. With some clinical examples, the profile type of the patient is analyzed to try to reach a paradigm.

## FREE COMMUNICATIONS 6: OTOPLASTY

(SA 22.09.18 – 14:00 – 14:30)

### Otoplasties: technique utilisée et satisfaction des patients

*Mermod Tessa<sup>1</sup>, Monnier Sandra<sup>1</sup>, Raffoul Wassim<sup>1</sup>*

<sup>1</sup> *Service de chirurgie plastique et de la main, CHUV, 1011 Lausanne, Suisse*

#### But de l'étude

L'indication opératoire d'une otoplastie se base essentiellement sur la demande du patient. Les malformations des oreilles concernent soit un défaut de plicature de l'anthélix, soit un angle céphaloconchal supérieur à 90° ou une hypertrophie de la conche ; souvent associées. Le diagnostic reste cependant subjectif selon l'appréciation du patient et de l'impact psychologique induit par ses oreilles. L'objectif de cette étude est d'une part de présenter une des techniques d'otoplastie utilisée au CHUV et d'autre part de rapporter la satisfaction postopératoire des patients.

#### Méthodes

C'est une étude rétrospective incluant les patients opérés d'une otoplastie bilatérale par le même opérateur entre octobre 2014 et décembre 2017 dans le Service de chirurgie plastique du CHUV. La technique chirurgicale débute par une incision rétro-auriculaire avec résection conchale en ellipse suivi d'une suture du cartilage conchal. Dans un second temps, au niveau antérieur, une incision mini-invasive est réalisée dans le pavillon, afin d'introduire la râpe de Stenström et réalisation d'un affaiblissement du cartilage permettant un bendaway afin de marquer l'anthélix.

Les patients ont bénéficié d'un suivi ambulatoire post-opératoire puis contactés téléphoniquement en 2018 afin de répondre à un questionnaire de satisfaction.

#### Résultats

Quatre patients ont été inclus dans cette étude. La technique chirurgicale utilisée n'a pas induit d'effet indésirable notable. Les patients se décrivent comme heureux du résultat esthétique.

#### Conclusion

Bien qu'avec un nombre de cas restreint, notre technique semble efficace et facilement reproductible avec des patients satisfaits.

## Otoplasty with anterior scoring technique: my experience with 154 patients

Brühlmann Yves<sup>1</sup>

<sup>1</sup> ZPC

For otoplasty many techniques were published, some using permanent sutures to maintain the cartilage folding, whereas other techniques rely on cartilage incisions and or excisions. The technique described in this presentation use a cartilage cutting in the scapha region and anterior scoring. The advantages and disadvantages will be exposed based on the experience with 154 patients treated with this method between 1999 and 2018. The average age was 23.9 years, 65 men and 89 women were operated. One infection was noted, while no hematoma was reported. Seven superficial skin erosions were described . Reoperations were done in 2 cases for minor corrections. One keloid was reported.

The cartilage cutting and anterior technique scoring otoplasty is a safe and reliable procedure with high satisfaction rate.

### The cartilage-sculpting-only otoplasty

Lehmann-Jaccard Catherine<sup>1,2</sup>, Modarressi Ali<sup>1</sup>, Pittet-Cuénod Brigitte<sup>1</sup>, Rüegg Eva<sup>1</sup>

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<sup>2</sup> Cabinet Dre Lehmann, 10 rue du conseil général, 1205 Genève

### Introduction

Various surgical techniques of otoplasty are known to correct congenital prominent ears. They all aim to reshape the ear as well correct its projection from the mastoid. A majority of them include permanent sutures and cartilage resection. The presented surgical technique is based only on cartilage sculpting, without the use of sculpting sutures. This study analyses the safety of the procedure and the quality of the aesthetic results.

### Patients and methods

This retrospective study includes patients operated between 1987 and 2017 at a University Hospital in Switzerland and in private practice by the first author working at both places. Exclusively patients operated by cartilage-sculpting-only otoplasty were included in this series. Reoperation rate for complication or aesthetic considerations as well as follow-up were assessed.

### Results

The series includes 71 patients with a follow-up of at least 1 year. Patients were generally satisfied of the aesthetic result and gave up their preoperative camouflage-habits. Surgical revisions were performed in 2 patients for hematoma. Neither infections nor skin necrosis occurred. Reoperations due to insufficient aesthetic result were performed in 3 patients.

**Conclusion**

Contrary to other otoplasty techniques the presented one avoids implantation of foreign bodies and cartilage resections. The risk for classic complications such as infection, exposure of sutures and secondary deformation is thus drastically reduced. The cartilage-sculpting-only otoplasty is a safe procedure with a low complication rate and stable results. However, it requires good understanding of the technique.

## FREE COMMUNICATIONS 7: AESTETIC

(SA 22.09.18 – 14:30 – 15:30)

### Trials and tribulations with broken breast implants

Lüdi S<sup>1</sup>, Kampmann M<sup>1</sup>, Meuli-Simmen C<sup>1</sup>, Eyer D<sup>1</sup>

<sup>1</sup> Clinic for Plastic, Reconstructive and Hand Surgery, Kantonsspital Aarau

#### Introduction

Rupture is one of the most frequent long-term complications after breast implant. Potential leakage of silicone into the body gives cause for an ongoing concern. In about 33% of symptomatic women and 8% of asymptomatic women rupture of silicone implants was reported, whereupon the risk for rupture increases with the age of the implant.

Breast MRI is assumed to be the gold standard for diagnosis of implant rupture and considered most sensitive for detection, but there is a reported high rate of false positive results. Ultrasound imaging demonstrates an alternative, but is highly examiner-dependent.

#### Case report

We present a case of an asymptomatic 64-year old patient with incidental finding of a suspected right implant rupture on MRI with salad oil sign and sonographic stepladder sign. No macroscopic lesion of the implant shell was detected after implant removal. Ultrasound and MRI of the removed implant confirmed the preoperative pathology showing liquid within the silicone gel.

#### Conclusion

Until now there are no reliable specific signs in MRI and ultrasound confirming implant rupture. The lesson learned from this case is the necessity to re-establish sound guidelines for diagnosis of breast implant rupture, indications for implant removal and contributions of the health insurance.

### Reoperations in patients with breast implants: medical and non-medical indications

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<sup>1</sup> Division of Plastic and Hand Surgery, Department of Surgery, University Hospital of Zurich, Switzerland

#### Introduction

This study describes the indications of reoperations in patients who have previously undergone breast augmentation or reconstruction with implants (index operation), and explores associations with patient characteristics, period since and attributes of the index surgery.

**Methods**

Retrospective case-series of patients with breast implants undergoing reoperations at the University Hospital of Zurich from 2011 through 2015.

**Results**

177 women with breast implants aged 44 years on average underwent revision, 108 with medical (e.g. capsular contracture, infection, hematoma), 35 with aesthetic (e.g. unsatisfactory result, asymmetry) and 34 with combined indications. The median period between index and revision surgery was 5.1 years in patients with medical and 2.8 years in patients with aesthetic indication for reoperation. The average revision implant weight was higher by 37 g than the index implant. Patient characteristics such as age, citizenship and BMI did not vary notably across the revision indication groups, although 37.1% of patients with aesthetic indication had previous unrelated surgery. In patients with aesthetic initial operation, median time from index to reoperation was 2.4 in younger and 7.7 years in older patients.

**Conclusions**

61% of the breast implant reoperations had medical and 20% aesthetic indications, while 69% of patients had initially undergone breast implant surgery for aesthetic reasons. In patients with aesthetic initial operation, those younger than 42 years (median) had a higher probability of reoperation than older patients.

## Why are we removing ruptured breast implants? a review of the literature

Dr. Derder Sabri<sup>1</sup>

<sup>1</sup>*Clinique Cécil, Lausanne*

**Background**

In most developed countries, current trends in medical and surgical handling of breast implant rupture suspicion go towards MRI scanning and recommending that patients have their implants removed, when a rupture is diagnosed.

We investigated whether this practice is supported by relevant scientific evidence.

**Methods**

A review of the literature was done, using Pubmed research, aiming at identifying all complications which might arise following rupture of a silicone gel filled breast implant.

**Results**

246 studies were found, searching with key words "implant or prosthesis rupture and complications", of which 36 were considered relevant to the question asked.

No threat to patient health or increased morbidity or mortality was identified, related to implant rupture, regardless of silicone gel filled implant generation.

### Conclusions

Contrary to current FDA recommendations and practice of plastic surgeons, radiologists and gynaecologists, we have no scientific grounds to recommend removal or change of ruptured breast implants, in an asymptomatic patient.

In cases of symptomatic ruptured implants, each case should be discussed with the patient, with an aim at reassuring, and only changing them when a real benefit can be expected from the procedure

### Medizintourismus: Komplikationen und ungewöhnliches Keimspektrum bei Wundinfektionen nach ästhetischen Eingriffen im Ausland

Thiel L<sup>1</sup>, Leitsch S<sup>1</sup>, Krug C<sup>1</sup>, Linder S<sup>1</sup>, Holzbach T<sup>1</sup>

<sup>1</sup> Hand- und Plastische Chirurgie, Spital Thurgau AG, Frauenfeld

### Introcution

Der Medizintourismus in der plastischen Chirurgie ist weit verbreitet und stark zunehmend, vor allem von Deutschland/Schweiz aus ins Ausland. Die Patienten werden durch billige Preise und hohen Versprechungen zB nach Tschechien oder in die Türkei gelockt. Dort wird oftmals an Qualität gespart, die zu Komplikationen führen, die bei uns nachversorgt werden müssen. Die favorisierten Prozeduren im Ausland sind Brust- und Straffungseingriffe sowie Fettabsaugung. Wir haben in den letzten Monaten zunehmend Patienten mit Komplikationen nach plastisch-chirurgischen Eingriffen in Osteuropa behandelt.

### Objective

Analyse der Komplikationen und Keimspektrum bei Wundinfektionen und deren Konsequenz.

### Methods

Retrospektiv alle Patienten mit Komplikationen nach ästhetischen Operation im Ausland, die zwischen 2016 und 2018 bei uns behandelt worden. Die Krankengeschichte wurde bezüglich demografischer Daten, Operation, Komplikation, Keimspektrum und Therapie reviewed.

### Results

Grossteil der Patienten, die sich in dem Zeitraum vorstellten, präsentierten sich mit ausgeprägten Wundinfektionen durch Mischinfektionen. Bei allen zeigte sich in der mikrobiologischen Untersuchung ein für uns eher ungewöhnliches Keimspektrum mit teilweise anaeroben Bakterien, sowie einer Reihe von gram-positiven und gram-negativen Problemkeimen. Alle Patienten benötigten Revisionseingriffe teilweise mit Vac Therapie, sowie eine antibiotische Therapie. Diese Keimspektren mit teils hoher Anzahl an Resistenzen zogen häufigere Antibiotikawechsel und antibiotische Kombinationstherapien mit sich. Weitere Komplikationen waren z.B. frühzeitige Kapsel-fibrose.

Trotz Warnungen nimmt der Trend des Medizintourismus rapide zu.

## Outcomeanalyse nach Mastektomie bei Gynäkomastie mittels modifiziertem Breast Q: Form vs. Narbe

Burger A<sup>1</sup>, Sattler A<sup>2</sup>, Kühn S<sup>2</sup>, Wellenbrock S<sup>2</sup>, Hüttinger S<sup>2</sup>, Giovanoli P<sup>1</sup>, Lindenblatt N<sup>1</sup>, Rieger UM<sup>2</sup>

<sup>1</sup> Klinik für Plastische Chirurgie und Handchirurgie Universitätsspital Zürich

<sup>2</sup> Klinik für Plastische Chirurgie und Handchirurgie, AGAPLESION Markus Krankenhaus

### Hintergrund

Ziel dieser Studie war es herauszufinden, wie zufrieden Patienten mit dem postoperativen Erscheinungsbild nach einer Gynäkomastie Operation, in Abhängigkeit von dem gewählten operativen Zugangsweg, sind. Das Augenmerk liegt auf Brustform und Erscheinungsbild der Narben.

### Material und Methoden

Die Akten von 59 Patienten, die sich bei Gynäkomastie zwischen 01/2014 und 12/2016 am AGAPLESION Markus Krankenhaus unterzogen wurden retrospektiv aufgearbeitet. Hierzu wurden die Patienten postoperativ mit einer modifizierten Version des für Patientinnen etablierten und wissenschaftlich validierten Fragebogen Breast Q<sup>®</sup> befragt und deren Ergebnisse analysiert. Einschluss in die Studie fanden alle Patienten, die den Bogen vollständig beantworteten.

### Ergebnisse

Es fanden 31 Patienten Einschluss in die Studie. Am häufigsten erfolgte die Entfernung der Brustdrüse über einen periareolären Zugang (n=27, 84,4%). Davon 22 mal (68,8%) ohne und 5 mal (15,6%) mit periarolärer Straffung.

Sieben mal (21,8%) wurde der submammäre Zugangsweg gewählt. Hiervon erfolgte einmal (3,1%) eine freie MAK Transplantation, 4 mal (12,5%) eine gestielte MAK Transplantation. Das operative Ergebnis wurde in der periareolären Gruppe mit 81,9% der möglichen Zufriedenheitspunkte bewertet, in der Gruppe mit submammären Zugangsweg mit 75,5%.

Narbenkorrekturen fanden drei von vier mal (75%) bei Patienten statt, die sich einer periareolären Straffung unterzogen.

### Schlussfolgerungen

Die Auswertung zeigt, dass die narbensparende Technik mit einer höheren Patientenzufriedenheit einhergeht. Häufig ist keine Hautstraffung notwendig. Ein ästhetisches Problem bleibt die häufig breite periareoläre Narbenbildung.

## Local heat preconditioning to prevent wound breakdown and skin necrosis in plastic surgery: a randomized study in bilateral reduction mammaplasty

Weinzierl A.<sup>1,2</sup>, Schmauss D.<sup>1,2</sup>, Finck T.<sup>1</sup>, Alfonso Coto J.C.<sup>2</sup>, Hopfner U.<sup>1</sup>, Egaña T.<sup>1,3</sup>, Machens H.-G.<sup>1</sup>, Harder Y.<sup>1,2</sup>

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<sup>3</sup> Institute for Biological and Medical Engineering, Pontificia Universidad Católica de Chile, Santiago, Chile

### Introduction

Soft tissue dissections or flap transfers depend on sufficient tissue perfusion. Inadequate perfusion is associated with a rate of wound breakdown and skin necrosis of up to 68% respectively 45%. Tissue preconditioning (PC) has been shown to mimic "surgical delay", an effective yet invasive and time consuming approach to reduce ischemia-induced flap-morbidity. This translational study aims at analysing the efficacy of local heat PC in reduction mammoplasty (RMP).

### Materials

Prospective randomised trial including 36 patients (mean age: 45 years; mean BMI: 27 kg/m<sup>2</sup>) undergoing bilateral RMP. Local heat PC initiated ~16hrs prior to surgery, using a water-cuff heated up to 43°C and moulded to the breast for three 30min cycles, interrupted by 30min cooling periods at room temperature. The contralateral breast was kept un-heated to serve as a control. Tissue perfusion (Laser Doppler), rate of wound breakdown, total healing time and expression of Heat Shock Protein (HSP)-70 (ELISA) were assessed.

### Results

No burns were induced. Mean resection weight of both breasts was comparable (left: 495g; right: 520g). Local heat PC resulted in reduction of wound breakdown from 35% to 10%.

## Inferior dermal triangular flaps to prevent pseudoptosis in mastopexy surgery: the inferior hammock technique

di Summa PG<sup>1</sup>, Watfa W<sup>1</sup>, Bramhall R<sup>2</sup>, Baudoin J<sup>1</sup>, Zaugg P<sup>1</sup>, Raffoul W<sup>1</sup>

<sup>1</sup> Department of Plastic, Reconstructive and Aesthetic Surgery, CHUV, Lausanne

<sup>2</sup> Canniesburn Plastic Surgery Unir, Glasgow Royal Infirmary, Glasgow, UK

### Introduction

This paper describes a new mastopexy technique developed for moderate to severe ptosis/pseudoptosis associated with upper pole deflation. Considering some of the most common risk factors generally considered predictive of worse outcomes (massive weight loss, multiple pregnancies, skin quality, smoking, age), we aimed to assess whether this technique could be beneficial in the support of the desired shape over time.

## Methods

Twelve patients were operated with the hammock mastopexy technique using inferior dermal flaps as a support for the glandular reshaping. Smoking, weight loss or multiparity with consequent inelastic skin, age, and lengthy nipple-areola complex lift were considered as independent risk factors for ptosis recurrence and bottoming out. Aesthetics results and changes in breast profile were assessed at 12 months postoperatively. Changes in post-op breast measurements were assessed for each patient by breast measurements and a superposition of the standardized breast photographs.

## Results

Satisfactory maintenance of shape and stable NAC position were seen at 12 month regardless of the number of risk factors. However, statistically significant difference was found in lower pole lengthening between patients with more than 3 risk factors compared to other groups. Aesthetic measurement matched satisfying cosmetic result, regardless of the number of risk factors.

## Conclusions

This mastopexy technique improves projection and reinforces the lower pole support with lateral and medial dermal flaps. The technique is safe, reliable and provides easily reproducible results for patients with risk factors for post-operative pseudoptosis.

## Foreign body-associated infection with nontuberculous mycobacterium (NTM) abscessus subtype massilense 10 years after aesthetic bilateral breast augmentation using silicone implants

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<sup>1</sup> Department of Plastic, Reconstructive, Aesthetic and Hand Surgery, University Hospital Basel, Switzerland

<sup>2</sup> Division of Infectious Diseases and Hospital Epidemiology, University Hospital Basel, Switzerland

## Background

Mycobacterium abscessus complex is a group of nontuberculous mycobacteria species that has been reported to cause foreign body-associated infections.

We herein describe a case of a 46-year-old woman presenting with an outbreak of M. abscessus 10 years after breast augmentation using silicone implants.

## Methods

Our patient presented with clinical evidence of an infected left breast 10 years after augmentation using silicone implants in South East Asia. She has a history of systemic lupus erythematosus (SLE) and is currently under steroid treatment for 6 weeks.

Left sided implant removal and capsulectomy was performed. After surgery, an empirical antibiotic therapy was started.

Less than one week later, our patient required the same revision surgery on the right side because of an infection of the right breast prosthesis.

The bacteriological results were negative for bacterial organisms.

### **Results**

Further microbiological analyses in order to detect atypical organisms revealed *Mycobacterium abscessus*, subspecies *massilense*. As we modified the antibiotic treatment according to antibiotic susceptibility patterns, local signs of infection gradually disappeared, and the antibiotic treatment was switched to oral treatment for one more year. After a follow-up of 10 months, the patient presented without any signs of infection.

### **Conclusion**

Early investigations with mycobacterial-specific diagnostics and an interdisciplinary approach is crucial in cases with persistent signs of infection. Treatment of *M. abscessus* subsp. *massilense* foreign body infection includes removal of the implants, capsulectomy and antimicrobial therapy according to antibiotic susceptibility patterns.

## POSTERS

(FR 21.09.18 – 12:30 – 13.30)

### Augmentation of the insertion site of a functional muscle flap using a partially resorbable mesh

Bauer MR<sup>1</sup>, Sproedt J<sup>1</sup>, Jung F<sup>1</sup>, Jandali AR<sup>1</sup>

<sup>1</sup> Kantonsspital Winterthur, Klinik für Hand- und Plastische Chirurgie

#### Introduction

When attaching a functional muscle flap there is a risk of insufficient fixation at the insertion site due to the weak properties of the muscle tissue of the flap. We present a method to strengthen the insertion by using a partially resorbable mesh (Vypro®).

#### Material and methods

We report on two patients with muscle flaps for functional reconstruction. In one patient elbow flexion was restored with a functional latissimus dorsi transfer. Another patient needed a functional restoration of plantar flexion and soft tissue covering of the calf after resection of a sarcoma. In both patients the insertion was augmented according to this technique.

#### Results

Both patients achieved good to excellent strength for elbow flexion and plantar flexion with mesh stabilization of the distal insertion. The functional results can be demonstrated by videos. No adverse effects of the mesh occurred.

#### Conclusion

When a strong attachment of the muscle flap to tendon or bone is needed in functional restoration, mesh augmentation might be a viable option.

### Much air about nothing: hand surgeons under pressure (edited)

Boucke Philipp<sup>1</sup>, Wirtz Christian<sup>1</sup>, Schibli Silvia<sup>1</sup>, Häfeli Mathias<sup>1</sup>

<sup>1</sup> Handchirurgie Kantonsspital Graubünden

#### Introduction

Spreading subcutaneous emphysema after trauma is one symptom of soft tissue infection caused by *Clostridium perfringens*. The clinical course of a gas gangrene is fulminant and associated with mortality up to 80%. Only early and extended surgical debridement in combination with high dose antibiotic therapy can decrease lethality to 20%. However not every subcutaneous emphysema is infection related. High pressure injuries and stab wounds can cause benign forms of emphysema. We present one case of subcutaneous emphysema. and highlight the importance of distinguishing from gas gangrene.

### **Methods**

A healthy 56-year-old carpenter sustained a cut on the dorsum of his right index finger. He continued work for 7 hours and presented at his family doctor complaining of a swollen hand. A crepitation at the dorsum of the hand up to the elbow was detected. After cleaning of the wound, the patient was sent to our emergency ward with question of gas gangrene. He was afebrile, non-tachycardic and in good condition. There was minor redness at the wound site but an impressive crepitus palpable throughout the dorsal compartments of the hand extending to the elbow. We treated the patient conservatively with immobilization and oral antibiotics.

### **Results**

The patient was reevaluated the next day and remained well. Incorporation of air caused by a bellows mechanism broadening along the extensor tendons was the explanation for this phenomenon.

### **Discussion**

Benign causes of subcutaneous emphysema should be considered in patients presenting without any signs and symptoms of an infectious process or systemic illness. This will avoid the unnecessary aggressive surgical exploration for a benign condition which is reserved for gas gangrene.

## **Postoperative wool pads instead of forced-air warming blankets post microsurgical procedures**

*Keijzer Welmoed<sup>1</sup>, Farhadi Jian<sup>1</sup>*

*<sup>1</sup> Plastic Surgery Group by Prof. J. Farhadi*

### **Introduction**

Over the past decades, microvascular free flap surgery has become an increasingly popular method in reconstructive surgery. Postoperatively, cooling of the flap needs to be prevented to avoid complications. In our practice, we introduced small pads made of lambswool to replace the forced-air warming blankets for postoperative management in free flap surgery. Our objective was to evaluate the results of the introduction of these pads.

### **Material and Methods**

All patients who underwent free flap surgery in our practice between December 2017 and April 2018 were managed postoperatively with lambswool pads on top of the flap. All these patients were asked to fill out a paper questionnaire about their experience with these pads.

### **Results**

A total of 39 patients underwent a free flap reconstruction between December 2017 and April 2018. All of these patients completed the questionnaire. 100% of the patients reported that, overall, they were positive about the warming pads. No flap loss was recorded.

## Conclusion

Wool pads appear to be a good replacement for warming blankets. There is no non-selective heating of the patient or the requirement of a noisy machine, which you get with the warming blanket. Therefore, we would recommend the use of the pads in the postoperative management of free flap surgery.

## Schwannomas mimicking melanoma metastasis: a rare diagnostic challenge in PET-CT

*Hirsiger Stefanie<sup>1</sup>, Mihai Constantinescu<sup>1</sup>, Radu Olariu<sup>1</sup>*

*<sup>1</sup> Plastic and Hand Surgery, Inselspital, University Hospital of Bern, Switzerland*

## Introduction

Schwannoma can mimick a variety of neoplasias in imaging. Although Positron-Emission-Tomography using variable tracers can help to distinguish malignant from benign lesions in other tumors, this is not the case in schwannomas. The current diagnostic standard is excisional biopsy. Schwannoma have been mistaken for a multitude of primary tumors and metastasis in the literature. There is no description of cases of schwannoma that were excised for the suspicion of metastasis of malignant skin tumours to the best of our knowledge.

## Patients and Methods

In our unit two known melanoma patients were treated for high-intensity lesions in PET that were suspected to be melanoma metastases.

## Results

### Case 1

A 66 year old patient was diagnosed with a malignant melanoma over his right scapula, which was excised in toto. Three years later a lumbar cutaneous melanoma metastasis was excised. PET-CT at that time showed a lesion suspect for metastasis in his right axilla. Excision showed schwannoma. Partial nervous injury occurred during surgery with persisting motor deficit and neuropathic pain.

## Ultrasound (US) in carpal tunnel syndrome (CTS): the inlet and outlet ratio

*Hirsiger Stefanie<sup>1</sup>, Vögelin Esther<sup>1</sup>*

*<sup>1</sup> Hand and Plastic Surgery, Inselspital Bern, University Hospital Bern, Switzerland*

Although, the cross-sectional area at the inlet of the carpal tunnel (CSAI) is used as a diagnostic marker in CTS, there is no standard to diagnose CTS with US. Because values can vary between subjects, ratios of multiple measurements along the median nerve have been proposed. The goal of this study was to retrospectively evaluate CSA measurements at 3 levels with associate ratios.

### Methods

20 (28 wrists) patients diagnosed with CTS were included in the study. Diagnosis was confirmed by clinical symptoms, nerve conduction studies and surgery in 25 wrists between 06/2016 and 01/2018. Measurements of CSA were performed using a 17-18.5 Mhz Linear Array Transducer (Philips iU22 or Philips 70 Affinity, Bothell, WA, USA). The absolute values of CSAInlet, CSATunnel and CSAOutlet and the ratios CSAI/CSAT (Rpre) and CSAO/CSAT (Rpost) were compared. Data were analyzed using Excel (descriptive) and GraphPad for unpaired student t-test.

### Results

Mean CSAInlet was 14.111mm<sup>2</sup> (SD 3.420), CSATunnel was 9.254mm<sup>2</sup> (SD 2.686) and CSAOutlet 13.279mm<sup>2</sup> (SD 2.981). CSAI and CSAO were significantly higher than CSAT ( $p < 0.0001$ ). The Rpre was in mean 1.634 (range 0.095-2.940) and Rpost was in mean 1.518 (range 0.778-2.304). When referring to published cut-off values ( $>12.6$  mm<sup>2</sup> for CSAInlet and  $>13.2$  for CSAOutlet) only 16 respectively 13 of 28 pathologic CSA values were identified. When using both criteria combined, this number rose to 20.

### Conclusion

In these 21 patients, CSA values before and after the carpal tunnel were significantly higher than under the retinaculum. A double ratio using absolute values could increase sensitivity for diagnosing CTS. Powered by TCPDF ([www.tcpdf.org](http://www.tcpdf.org))

## Girdlestone & vastus lateralis pedicle flap: a single step procedure for chronic recurrent hip infection

Lucas Dominique<sup>1</sup>, Muller Camillo<sup>1</sup>, Mahmoud Ramzy<sup>1</sup>, Rotunno Teresa<sup>1</sup>, Raffoul Wassim<sup>1</sup>

<sup>1</sup>Service de chirurgie plastique et de la main, CHUV, Rue Bugnon 46, 1011 Lausanne

### Introduction

Girdlestone arthroplasty is a procedure that consists of excision of affected proximal femur to treat recurrent chronic osteomyelitis of the hip joint. However, this resection results in a sizeable defect. The vastus lateralis (VL) flap is considered as a soft tissue filler option to fill this void.

### Methods

Eight consecutive cases operated at our department using the VL muscle flap after Girdlestone arthroplasty as a single step procedure were reviewed. Complications at the donor or the recipient site were defined as minor (dehiscence with local treatment) or major (requiring other operative procedures) and evaluated.

### Results

7 patients had a history of spinal cord injuries. 3 patients had minor dehiscence at the recipient site and 3, having recurrent osteitis, required an additional operative procedure to close the

defect. One patient's wound was from multiple prior failed hip replacements. He finally became ambulatory using a walker after the reconstruction. Ultimately, 5 flaps healed satisfactorily without the need for further operative intervention. The donor site showed good healing.

### Conclusion

In the management of chronic persistent infection of the hip, the use of a transposition flap can be combined reliably and easily with a Girdlestone arthroplasty in a single step procedure. We will detail the different steps of surgical technique.

## Synoviallappenplastik nach Wulle zur Deckung des Nervus medianus: wieder entdeckt

*Fischer Vera<sup>1</sup>, Hirsiger Stefanie<sup>1</sup>, Haug Luzian<sup>1</sup>, Vögelin Esther<sup>1</sup>*

<sup>1</sup> *Klinik für Hand- und Plastische Chirurgie, Inselspital Bern*

### Einleitung

Die von Wulle (1980) beschriebene Synoviallappenplastik ist eine ideale Alternative zur Umhüllung des N. medianus, welche dünnes, vaskularisiertes Gleitgewebe aus der Umgebung ohne Volumenvermehrung im Karpalkanal verwendet. Ziel dieser retrospektiven Fallserie ist es die Resultate in unserem Patientengut zu untersuchen.

### Methoden

Von 2015-2018 wurden 7 Patienten im Alter von 47-78 Jahren mit insgesamt 8 Synoviallappen versorgt. Bei den teils mehrfach voroperierten Karpaltunnelrezidiven wurden die Adhäsionen präoperativ sonographisch bestätigt. Die Patienten wurden bezüglich (VAS) Schmerzskala, Kraft und Sensibilität untersucht.

### Resultate

Follow-up war 7-26 Monate. In 4 Fällen kam es zur postoperativen Verbesserung der 2-Punkte-diskrimination. Ausnahmslos sistierten Kribbelparästhesien und es war eine subjektiv deutliche Besserung der Schmerz-Symptomatik von durchschnittlich VAS 7 auf VAS 3 zu verzeichnen. Zudem zeigte sich, insbesondere bei den traumatisch bedingten Rezidiven, eine deutliche Besserung der Faustschluss- und

## Improvement of severe burn patient care at 17 years interval: two extreme cases

*Monnier Sandra<sup>1</sup>, Haselbach Daniel<sup>1</sup>, Hirt-Burri Nathalie<sup>1</sup>, Applegate Lee Ann<sup>1</sup>, Raffoul Wassim<sup>1</sup>*

<sup>1</sup> *service de chirurgie plastique et reconstructive, CHUV, centre hospitalier universitaire vaudois, Lausanne*

We report two young, healthy patients (22 and 39 yr) who suffered a 90%TBSA burn, both managed in the CHUV burn center at a 17 years interval. Major differences were observed: length of stay (162 d vs 76 d for ICU and 24 mo vs 9.5 mo for total hospitalization), time to wound closure (7.5mo vs 4mo) and time to first ambulation (4mo vs 2mo) were significantly different, for Patient 1 and 2 respectively.

Medical and surgical management parameters were analyzed.

Main differences are that Patient 1 has suffered inhalation injury and presented a slightly higher deep burn surface (85% vs 75% respectively).

Patient 1 presented some major complications, mainly ARDS, abdominal compartment syndrome and multiple infections. Number of surgeries was 31 vs 15, and additional general anesthesia were 81 vs 14 respectively.

On the medical side, fluid resuscitation management evolved towards a more conservative protocol, preventing some secondary complications.

Main surgical management change between the two patients was the evolution of cellular therapy techniques (93% vs 279%) and the use of cadaver skin (100% vs 7%).

Autologous cell therapy using keratinocytes is being used for more than 30 years in our center with the same technical specifications. We have integrated allogenic cell therapies and routinely use these for severe burn patients since 2013 that replaced cadaver skin. Patient 1 has therefore benefited an equivalent of 93% vs 90% TBSA of autologous cultured cells and 0% vs 189% of allogenic fetal cells biologic dressings.

Despite some inherent differences between patients upon arrival as well as medical management improvement, cell therapies might have an impact in patient outcome.

### **Ein Chordom im Handgelenk? Behandlungsalgorithmus für extra axiale Chordome der oberen Extremität**

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Chordome sind sehr seltene, langsam wachsende Tumore aus Überresten der Chorda dorsalis. Daher treten Chordome auch hauptsächlich im Bereich der Wirbelsäule auf. Extra axiale Chordome, also Manifestationen ausserhalb der Körperachse, werden je nach Literatur mit einer Inzidenz von 0,08/100000 angegeben. Für Chordome der oberen Extremität existieren sogar nur Fallberichte.

Die Behandlung axialer Chordome erfordert nach aktuellen Richtlinien eine weite Resektion. Dies stellt den Chirurgen im Bereich der Hand und des Handgelenks jedoch vor eine Herausforderung. Zusätzlich etablieren sich aber auch noch andere Modalitäten zur Behandlung dieses metastasierenden Tumors.

Wir möchten den ersten beschriebenen Fall zwei primärer extra axialer Chordome im Handgelenk vorstellen und gleichzeitig einen Behandlungsalgorithmus für diese seltene Erkrankung, an einer komplexen Lokalisation diskutieren.

### Is the bilateral use of the superficial temporal vessels as donor vessels safe for the circulation of the forehead? literature and case study

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#### Introduction

The blood supply of the forehead is covered by various arteries. The upper third of the face is subdivided in to the central forehead, the hair-bearing scalp and the temporal regions. The arteries supplying these regions raise from the external carotid artery and also from the internal carotid artery raising branches such as the superficial temporal artery, supratrochlear artery, supraorbital artery, transverse frontal artery and nasal artery.

#### Methods

We present a case report of an 58 year old patient with an adenocarcinoma of the sinonasal tract infiltrating the frontal sinuses, both orbits and the crista galli as the initial diagnosis in 2014. The first signs were recurrent epistaxis and he was working as a floorer. The patient was operated on but the tumour could only be resected partially. The frontal bone lesion was covered with a plate. Subsequently a radiotherapy was initiated. This lead to an ulceration of the frontal skin and revision was performed. Unfortunately the ulceration was recurrent and progressive which lead to a large open wound with visible material of the osteosynthesis and a revision was indicated. We performed a bicoronal incision to remove the osteosynthesis and covered the defect with a free radial forearm flap anastomosed to the superficial temporal artery. Because of further progression of the tumour another free flap was anastomosed to the opposite side to cover the open, ulcerated defect.

#### Results

Even after breaking down the main supplying arteries of the forehead and nose we never had a circulatory disorder of the skin in this region. The compensation of the blood supply was, astonishingly, never insufficient.



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