

## The Surgical Diamond Initiative (SDI) in symptomatic Cysts of Carpal Bones

(Abstract ID: 604)

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### Background:

The advantage of this method in the treatment of symptomatic carpal cysts is the early revascularization of the transplanted bone graft. This allows reconstruction procedures, even when a cortical destruction exists.

### Materials and methods:

The SDI procedure uses (water cooled) diamond tools, coated with natural diamonds. By this method, the only artifact visible is a slight demineralization of 20 µm along the cutting line, the trabeculae and cells remain intact. For taking these graft cylinders out, a sharp extractor is used. The set of instruments is based on the "twins principle": the outer diameter of the smaller tools are 1/10 to 15/100 of a mm within the larger tools, respectively, smaller than the inner diameter of the next following size, thus yielding a press-fit seat of the graft. This press-fit seat of the graft allows an early revascularization of the transplanted graft cylinders: after one week a bony ingrowth of 1500 µm could be shown in histological examinations using the tetracycline labels. Tips and tricks of this rarely used innovative treatment procedure are explained in detail.

### Results:

Incorporation of these bone grafts could be achieved in all patients with symptomatic cysts. The pain relief displayed on VAS reached 2.1. According to the Mayo Wrist Score Chart a good result (83 points) was achieved.

### Conclusion:

This procedure is a promising alternative procedure in treating symptomatic cysts of carpal bones, even if they show destruction of their cortical border. Tips and tricks that have emerged from the development of this method, are crucial to the success of surgery.

## Characteristics and management of penetrating abdominal injuries in a German level I trauma center

(Abstract ID: 792)

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### Background:

Penetrating abdominal traumas caused by stabbing or firearms are rare in Germany, thus there is lack of descriptive studies on this patient cohort. However, penetrating abdominal injuries might increase in their incidence, but the management, especially of hemodynamically stable patients, is still under dispute. The aim of this study was to review our experience and further evaluate and improve our management of penetrating abdominal injuries in a level I trauma center in Germany.

### Materials and methods:

All patients with penetrating abdominal injury admitted to our level I trauma center between January 2006 and December 2015 were included to retrospective study. Patients were identified from patient records using ICD-10 codes. The data of all patients regarding demographics, surgical management, clinical and outcome parameters were examined. Further, charts were reviewed for FAST and CT results and correlated with intraoperative or follow-up findings.

### Results:

A total of 115 patients with penetrating abdominal trauma with a mean age of  $36,2 \pm 14$  years (87,8 % men) were analyzed. In 69 patients the penetrating injuries were caused by interpersonal violence and included 88 stab wounds and 4 firearm wounds. 76,5 % of the patients were admitted to our trauma room and 8 patients (6,9 %) presented in shock. 52 patients (44,8 %) suffered additional extraabdominal injuries. Almost two-thirds of all patients (61,7 %) underwent surgical treatment (45 laparoscopy with 11 converted to laparotomy, 26 laparotomy) and 38 were managed nonoperatively. Hereof, 25 laparoscopies and 3 laparotomies were nontherapeutic. There were 2 missed injuries, but no patient experienced morbidity or mortality related to delay in treatment. The majority of abdominal injuries affected hollow organs and the liver. 9 patients (7,8 %) developed complications and 2 patients (1,7 %) died. Mean length of hospital stay was 7,9 days.

There were 107 (92,2 %) FAST and 92 (79,3 %) CT scans performed. Sensitivity and specificity of FAST were 57,5 % and 95,5%, respectively, while those of CT were 89,7 % and 86,5%, respectively.

### Conclusion:

In this evaluation of penetrating abdominal trauma, the majority of injuries affect young men and are due to stabbing. In hemodynamically stable patients without signs of peritonitis a CT scan is indicated. In case of no pathological findings, these patients may benefit from nonoperative management with serial clinical assessments and intensive observation. If surgical treatment is required, diagnostic laparoscopy for stable patients is feasible and may be considered as a tool to evaluate peritoneal penetration in an effort to avoid nontherapeutic laparotomy.

## **One-stage bilateral total hip arthroplasty through a minimally invasive anterior approach (AMIS): Functional outcomes and complications in 45 patients with 2-year follow-up**

(Abstract ID: 49)

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### **Background:**

One-stage bilateral total hip arthroplasty (THA) has many advantages such as a single hospital stay, a shorter rehabilitation time and decreased management costs per patient. The use of this strategy is limited however cause a possible increase in the perioperative complication rate. In this study our objectives were to evaluate functional outcomes and complications in patients managed with one-stage bilateral total hip arthroplasty performed by a minimally invasive anterior approach. Hypothesis: The complication rate after one-stage bilateral total hip arthroplasty is not significantly different from that after unilateral THA.

### **Materials and methods:**

Two German surgical centres participated in a retrospective observation study of patients managed with one-stage bilateral minimally invasive THA performed by one surgeon. The 45 included patients (31 female, 14 male) had a mean age 56 years (range, 35-77) and a follow-up of 24 months.

### **Results:**

Mean hospital stay length were 9,2 days (range, 6-18), mean operative time was 165 minutes (range, 92-185), mean bloodloss intraoperatively was 548,9ml, and mean haemoglobin levels were 14,3 g/dl preoperatively and 11,1 g/dl postoperatively. No perioperative complications or deaths were recorded. The Harris hip score (HHS) improved from 40,87±16,45 preoperatively to 98,89±1,13 at last follow-up. The High Activity Arthroplasty Score (HAAS) improved from 7,47±2,90 preoperatively to 14,52±1,36 after 24 months postoperatively. The general quality of life questionnaire (FLZ) improved from 59,62±8,56 to 71,11±6,04 and the health quality of life questionnaire (FLZ) improved from 60,00±7,05 to 72,86±5,29.

### **Conclusion:**

The results of this multicentre retrospective study indicate that one-stage bilateral THA through a minimally invasive anterior approach is a valid alternative to two-stage bilateral THA in American society of anaesthesiologists score (ASA) 1, 2 and 3 patients with a preoperative haemoglobin level of about 14 g/dL. No complications were recorded.

## Revision surgery after proximal femoral nail implantation – what are the challenges? Can general risk factors be identified?

(Abstract ID: 69)

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### Background:

The demographic development will cause a significant increase of proximal femoral fractures. Approx. 4.5 million hip fractures worldwide are expected in the year 2050. Revision surgeries are increasingly expected with ever-older patients with multiple comorbidities. How high is this number? What are the challenges? Can primary internistic diseases be identified as risk factors?

### Materials and methods:

In the context of a retrospective study, we analyzed all patients (n = 613) who were treated with a gamma or ZNN nail at our clinic from 2007 to 2015 due to the presence of a pertrochanteric fracture. 53 patients (on average 78 years old, 24♂, 29♀) had implant-related complications (8.6%), 6 cases (1%) of which even during the primary hospitalization. Within the first postoperative year, one or more revision surgeries were performed on 41 patients. The AO classification of the 53 cases showed initially 6 A1 (14%), 30 A2 (57%) and 17 A3 (29%) fractures. 31 short, respectively 22 long nails were implanted.

### Results:

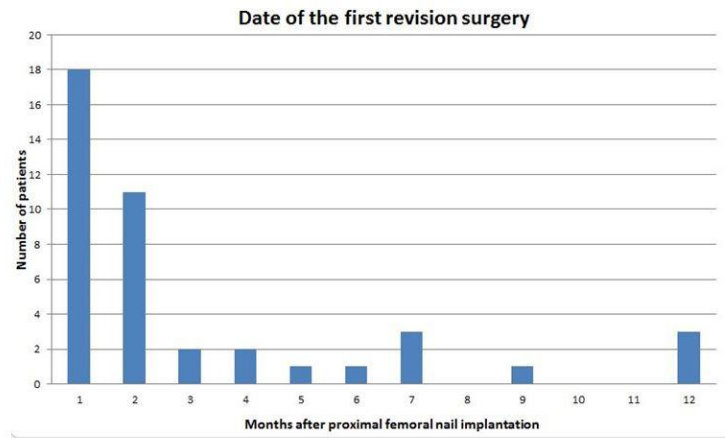
On average, the first revision surgery was performed after 8.3 months (2 days to 78 months). Indications were cut-out (38%), osteoarthritis (6%), loss of reduction (13%), trochanteric pain (11%) or implant failure (6%). Individual cases were pseudarthrosis, malrotation, infection (2 cases) or failure of the distal locking screw. In total, there were 82 re-hospitalizations with 86 operations. As part of the first revision, 20 patients were treated with a total hip arthroplasty (THA) and 8 with an endoprosthesis. In 5 patients, the femoral lag screw was replaced and in 9 cases a nail extraction was carried out. Individual patients were treated with additional cerclage or de-rotation. Approx. two-thirds (35 of 53) of the patients were cured after the first revision surgery. In the remaining 18 patients, an additional 34 surgeries took place. Out of these, 20 surgeries were performed due to infections in 4 cases. Other follow-up interventions were: 2 evacuations of hematomas, one change of the femoral lag screw, conversion to a THA (4x) or to an endoprosthesis (3x) and one nail extraction. After the conversion to a prosthesis 10 dislocations occurred in 4 patients, all of them could be treated by closed reduction. In 3 of these 4 cases an acetabular cup re-positioning was necessary.

### Conclusion:

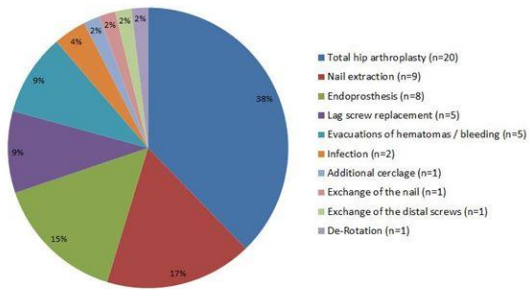
Implant-related complications in 8.6% of the cases treated with proximal femoral nailing are in line with the current literature. No study of the revision surgeries with their complications per se and possible risk factors has been published yet. The evaluation of the revision timing showed a biphasic course. Thus 77% of all revision surgeries were carried out within the first year, 53% even within the first 2 months and were primarily due to cut-out, early infections or loss of reduction. The remaining 23% were on average revised after 28.3 months. The main causes here were secondary coxarthrosis, trochanteric pain or implant failure. Loss of reduction (13%) together with the cut-outs (38%) were the reason for revision in more than half of the cases. A careful nail implantation may prevent re-operations. 66% of our patients in question were cured after one revision surgery. However, 18 patients required follow-up interventions and belonged almost exclusively (13 of 18) to the aforementioned early revision group. In addition to the infection treatment, an early conversion to a prosthesis is often demanding from a technical point of view. The analysis of the systemic diseases did

not demonstrate any significant risk factors. In our patients with implant-related complications we found a diabetes mellitus in 23%, oral anticoagulants in 8% and steroid use in 4% of the cases.

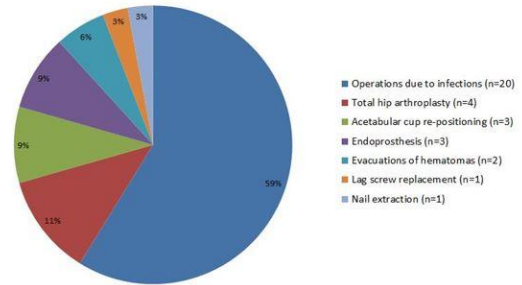
**Picture:**



**First revision surgery - treatment**



**Follow-up interventions after first revision surgery**



## **Reconstructive Procedures for Management of Cold Cases of Acetabular and Proximal Femur Fractures**

(Abstract ID: 689)

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### **Background:**

In cases of pseudarthrosis or malunited fractures of the acetabulum or proximal femur the therapeutic challenge is to decide, whether a reconstructive procedure is possible or an implantation of an prosthesis is necessary.

### **Materials and methods:**

In the treatment of pseudarthroses of femoral neck fractures, the corrective osteotomie is in young patients an alternative procedure to the total hip implantation, if the femoral head is viable and the patient has high demanding activities. In the treatment of deformities of the proximal femur after malunited fractures, the corrective osteotomie is the method of choice. In these cases the surgeon has to be aware of the preoperative range of motion of the particular joint. A preoperative planning is mandatory. After acetabular fractures necrosis and arthrosis could be the problems. The treatment plan and the type of the prosthesis to be choosen is depending upon the bony defect of the acetabular. In cases of pseudarthrosis additionally stabilisation procedures are mandatory. The treatment possibilities in special cases (Osteonecrosis, pseuarthrosis or malunited fractures of the pelvis) are challenging. Depending on the situation special prosthetic implants are necessary.

### **Results:**

In these difficult cases, depending on the age and activitiy level of the patient, corrective procedures are a method of choice. If reconstructive procedures are not possible, depending on the bony defect and the age of the patient special implants are necessary.

### **Conclusion:**

The most important factor remains the "number of years" of practice of an experienced surgeon.

## **Bone and Soft Tissue Reconstruction: The Concept of a Reconstructive Elevator**

(Abstract ID: 701)

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### **Background:**

The management of compound fractures of the lower leg has changed since it has been possible to use free and pedicled flaps when reconstructing the lost soft tissue. In case of bony defects cancellous bone graft is a well-established procedure; the Ilizarov method allows to reconstruct even greater bony defects.

### **Materials and methods:**

The basic principle in the treatment of these severe injuries remains the radical debridement. In case of infection surgical clearance of the focus of infection is mandatory. Bone and soft tissue defects need combined reconstructive procedures, which had to be chosen according to the defect. It is mandatory that these reconstructive procedures of the bony defect as well as the soft tissue defect have to be combined according to the need of the injured patient. The development in surgical techniques with more complex methods of reconstructive procedures had changed the old reconstructive ladder. The New Reconstructive Ladder includes the increasing levels of complex reconstructive procedures and allows achieving the required level needed for reconstruction of the injured limb. A multitude of factors has to be considered to choose the right procedure. Concerning the soft tissue reconstruction, the reconstruction of the soft tissue layer is one goal which has to be achieved. The other objective is to use the soft tissue reconstructive procedures as well as a functioning flap to increase the functional results of the injured extremity. To choose the right method, the concept of a ladder is no longer appropriate, this concept of an elevator is faster, more variable and up-to-date.

### **Results:**

Combined reconstructive procedures in these severe injuries must be chosen according to the extend of the soft tissue and bony defect, according to this concept. But nevertheless in case of need, also the more simple procedures have to be included in this concept of the Reconstructive Elevator just in case these complex procedures fail or are not practicable.

### **Conclusion:**

In the decision-making process the model of a reconstructive ladder has to be changed to the concept of an reconstructive elevator according to the demand of the extend of the injury as well as the situation demands. This concept of an Reconstructive Elevator is mandatory for the decision making process.

## **Femur Fracture in Patients with Hip Arthroplasty: all problems solved?**

(Abstract ID: 705)

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### **Background:**

Periprosthetic fractures will be an increasing problem, regarding the age pyramid of our society. Specific problems are the implant instability and the bone loss.

### **Materials and methods:**

55 patients (male 22, female 33), treated between 2004 and 2014, could be included in this study. 53 patients had a total hip arthroplasty, 2 patients had a total hip and knee arthroplasty. There had been, according to the Vancouver classification, 16 type B1, 8 type B2, 10 type B3 and 21 type C1 fractures.

A revision stem was used in 19 cases, a LISS plate alone was implanted in 9 cases, in 17 cases in a LISS plate in combination with a cerclage wire was used. In 8 cases the fracture was stabilised using a cerclage wire. In two patients the fracture was stabilised primarily with external fixateur..

### **Results:**

There had been 4 complications in 3 patients. A detached LISS plate as well as a delayed healing occurred each twice. A revision stem was necessary in one case, a refixation of the LISS plate was used in two cases, a corticocancellous bone graft was additionally implanted. All these complications healed after these procedures.

### **Conclusion:**

1. Surgery should be performed within 2 days of accident to decrease the mortality.
2. Attention has to be done for differentiating B1 and B2 type. A revision arthroplasty has to be performed perform, when in doubt.
3. The more simple the fracture, the more anatomic the reduction should be.
4. Cerclages should be used in every case (LISS plate).



## **A double-barrelled fibula graft to treat a late posterior ring instability related to a surgical treated symphysis pubis**

(Abstract ID: 712)

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### **Background:**

Symphysis pubis is a rare (non-) infectious inflammation of the symphysis and the surrounding tissue including the adjacent pubic bones. Surgically treated, the symphysis and involved parts of the pubic bone are resected. This resection might contribute to an anterior instability affecting the posterior arch and the sacroiliac joints.

### **Materials and methods:**

We report about a 50-year-old women sustaining from symphysis pubis treated by resection of the symphysis pubis and parts of the pubic bones. For stabilization and local antibiotic treatment a cement spacer was implanted. Due to clinical inconspicuous findings and the patient's desire, no additional surgery was performed. After two years the spacer dislocated, the patient complained about pain in the posterior arch and impaired mobility.

### **Results:**

Reconstruction surgery was planned comprising the accrued space bridging with a vascularized double-barrelled fibula graft, plate osteosynthesis and rectus abdominis flap coverage. Surgery led to pain relief and enhanced mobility.

### **Conclusion:**

The surgical treatment of a symphysis pubis might lead to an anterior arch instability, involving also the posterior arch, decreasing pelvic ring stability and patient mobility. The vascularized double-barrelled fibula graft is an opportunity to treat this complication or other etiologies of anterior pelvic ring stability with large bone defects using.

The abstract was already published as Case Report in below mentioned journal:

Arch Orthop Trauma Surg.<<https://www.ncbi.nlm.nih.gov/pubmed/26506827#>> 2016 Jan;136(1):47-53.  
doi: 10.1007/s00402-015-2355-y. Epub 2015 Oct 27.

## Reliability of venous blood gas analysis and radionuclide angiography in posttraumatic dystrophy

(Abstract ID: 742)

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### Background:

The diagnosis "posttraumatic dystrophy" (PTD) first was defined with clinical and paraclinical criteria by Scola et al. 2013. The objectivity and reliability of the paraclinical criteria (venous blood gas analysis [vBGA], radionuclide angiography [RNA]) and recommendations for therapy should be proofed in a prospective analysis.

### Materials and methods:

Five patients were treated with clinical signs of posttraumatic nonbacterial inflammation of the hand. The diagnostic and therapeutic procedures were performed as published before. The primary traumata (four fractures and one soft tissue injury) were located either in the region of the hand or forearm. The reason for admission was always an unsuccessful outpatient treatment. One patient with remarkable amount of bone loss in the hand skeleton was treated with bisphosphonates for six months.

### Results:

All patients fulfilled the clinical and paraclinical criteria for the diagnosis PTD. On admission an elevated venous partial pressure of oxygen was found by vBGA in the affected hand ( $\Delta pO_2$  mean  $22 \pm 4$  mmHg, tab. 1) and furthermore a hyperperfusion by arteriovenous anastomoses (fig. 1) was measured using RNA (mean  $75 \pm 47$  %, tab.1). The recommended symptomatic treatment for three weeks showed very good results. Until discharge all patients reached a full function of the hand with minor loss of strength (venous  $\Delta pO_2$  mean  $5 \pm 3$  mmHg, tab. 1). In the one patient treated with bisphosphonates radiographs showed a good recalcification after 6 months. A rebound phenomenon was not observed.

**Table:**

Nr.	age, m/f	weeks after trauma	injury and therapy	$\Delta pO_2$ venous (A) mmHg	RNA (A) av shunt $\Delta vol\%$	$\Delta pO_2$ venous (D) mmHg
1	72/f	8	distal radius fracture left, op.	23	54	2
2	65/f	8	distal radius fracture left, op.	18	151	2
3	59/f	10	cut of ulnar artery left, patch	26	56	10
4	59/f	8	radial head fracture right, op.	26	86	4
5	60/f	7	distal radius fracture left, op.	19	27	5
			mean standard deviation	22 4	75 47	5 3

Tab. 1. Data of patients with posttraumatic dystrophy (PTD) of the hand: differences of partial pressure of oxygen found in venous blood gas analysis (vBGA) of both cubital veins and perfusion using radionuclide angiography (RNA) of the hands (A: admission, D: discharge).

**Conclusion:**

The reliability of clinical and paraclinical criteria for PTD could be approved. RNA and vBGA seem to be characteristic parameters to confirm this diagnosis. The discrepancy between "rubor", a symptom of inflammation that is normally interpreted as "hyperemia", and paraclinical findings in PTD focuses the cause for this posttraumatic syndrome on a microvascular dysfunction (MVD).

**Picture:**

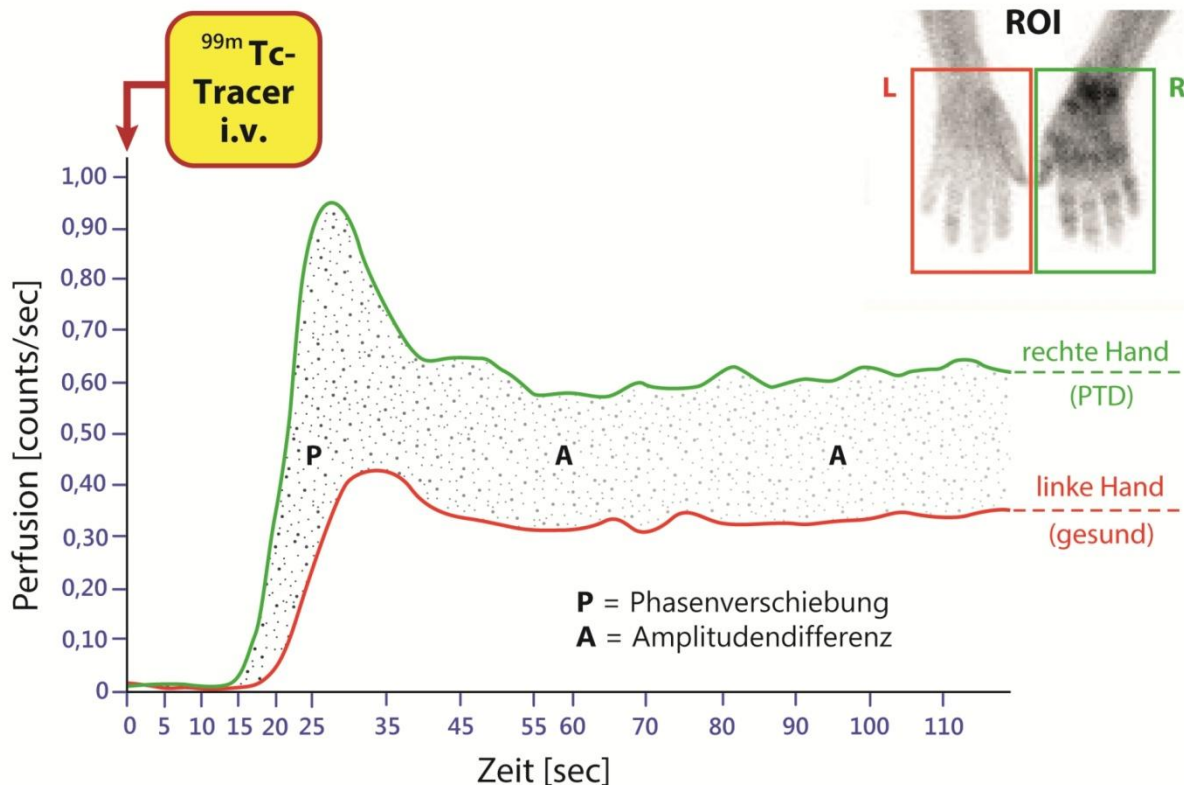


Fig. 1. Radionuclide angiography (RNA) of the hands (ROI: region of interest) of patient Nr. 4 on admission with 99m technetium (further details see Scola et al. 2013). The shift of the phases (P) and earlier slope (invasion of nuclides) in the right hand indicate the reduced microvascular resistance, the difference of the amplitude (A) the hyperperfusion of the right hand (shunt volume 86%). Together with the elevated partial pressure of oxygen in the venous blood gas analysis in the affected side ( $\Delta pO_2$  26 mmHg) these are the characteristic signs for open arteriovenous shunts. They are responsive for microvascular dysfunction (MVD) and capillary hypoxemia, i.e. reduced partial pressure of oxygen in spite of normal systemic oxygen saturation.

## Tourniquet-induced ischaemia during total knee arthroplasty results in higher proteolytic activities within vastus medialis cells: a randomized clinical trial

(Abstract ID: 745)

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### Background:

Recent data suggest diminished post-operative quadriceps muscle strength after tourniquet application during total knee arthroplasty (TKA). The metabolic effects of the commonly utilized intraoperative tourniquet with consecutive ischaemia on the skeletal muscle cells were unknown. Ubiquitin proteasome system represents one of the main pathways involved in muscle protein breakdown contributing to muscle atrophy. Therefore, the purpose of the present study was to quantify the acute effects of the tourniquet application during TKA on the (1) concentrations of free/conjugated ubiquitin, (2) total ubiquitinprotein ligase activity, (3) proteasome-dependent and (4) proteasome-independent peptidase activities in the cells of vastus medialis.

### Materials and methods:

As part of the randomized, controlled, monocentric trial (Clinical-Trials.gov NCT02475603) 30 patients scheduled to undergo primary TKA. Each patient was randomly assigned to the tourniquet (n = 15) or non-tourniquet group (n = 15) after receiving a written consent. Muscle biopsies of (5 × 5 × 5 mm) 125 mm<sup>3</sup> were obtained from vastus medialis immediately after performing the surgical approach and exactly 60 min later. After preparation of the muscle tissue specimen, the concentrations of the free/conjugated ubiquitin (Ub) were measured by western blot analyses. The ubiquitination was determined as biotinylated Ub incorporated into the sum of the cytosolic proteins and expressed as total ubiquitin-protein ligase activity (tUbPL). The quantification of the proteasome-dependent and proteasome-independent peptidase activities was performed with peptidase assays. The effect size was 0.4 with a statistical power of 0.8. The study was approved by our Institutional Ethics Committee (2012334N-MA).

### Results:

Tourniquet application did not influence the concentration of the free/conjugated Ub. There were no differences in tUbPL activities between groups and time points. Tourniquet-induced ischaemia resulted in statistically significant higher proteasome-dependent (caspase-like p = 0.0034; chymotryptic-like p = 0.0013; tryptic-like p = 0.0036) and proteasome-independent (caspase-like p = 0.03; chymotryptic-like p = 0.0001; tryptic-like p = 0.0062) peptidase activities.

### Table:

	non-tourniquet	tourniquet
age (y) mean ± SD	70.6 ± 7	70.6 ± 6
gender (n)		
male	7	7
female	8	8
side (n)		
right	10	6
left	5	9
body mass index (kg/m <sup>2</sup> ) mean ± SD	33.8 ± 5	32.1 ± 5

Comparison between the groups concerning demographics and body mass index

**Conclusion:**

Tourniquet application did not affect the free/conjugated Ub as well as tUbPL significantly, emphasizing the sophisticated regulation of ubiquitination.

The proteasome-dependent and proteasome-independent peptidase activities were significantly upregulated during tourniquet application, suggesting an increase in protein degradation, which in turn might explain the skeletal muscle atrophy occurring after TKA.

These findings add further knowledge and should raise the awareness of surgeons about the effects of tourniquet-induced ischaemia at the molecular level.

Additional high-quality research should clarify the short- and longterm clinical significance of the present data.

## CCL-2 as possible early marker for remission after traumatic spinal cord injury

(Abstract ID: 862)

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### Background:

Subsequent to traumatic spinal cord injuries (TSCI) the associated various pathophysiological processes are still poorly understood. In this study we sought to determine the mechanisms of chemotaxis as an integral part of the neuroinflammatory processes after TSCI.

### Materials and methods:

Samples and clinical data of 141 patients affected by a TSCI were collected. We examined the serum levels of CCL-2, CCL-3, CCL-4 and CXCL-5 over a 12-week period; in particular, at admission and 4, 9, 12 hours, 1 and 3 days and 1, 2, 4, 8, 12 weeks after trauma. According to our study design, we matched 10 patients with TSCI and neurological remission with 10 patients with an initial ASIA A grade and no neurological remission. Ten patients with vertebral fracture without neurological deficits served as control. Our analysis was performed using a Luminex Cytokine Panel. Multivariate logistic regression models were used to examine the predictive value with respect to neurological remission vs. no neurological remission.

### Results:

The results of our study showed differences in the serum expression patterns of CCL-2 in association with the neurological remission (CCL-2 at admission  $p=0.013$ ). Serum levels of CCL-2 and CCL-4 were significantly different in patients with and without neurological remission. The favoured predictive model resulted in an AUC of 93.1% in the ROC analysis.

### Conclusion:

Our results indicate that peripheral serum analysis is a suitable concept for predicting the patient's potential for neurological remission after TSCI. Furthermore, the initial CCL-2 concentration provides an additional predictive value compared to the NLI (neurological level of injury). Therefore the present study introduces a promising approach for future monitoring concepts and tracking techniques for current therapies. The results indicate that future investigations with an enlarged sample size are needed in order to develop monitoring, prognostic and scoring systems.

## Significance of altered IL-5 serum-levels after traumatic spinal cord injury

(Abstract ID: 865)

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### Background:

The various pathophysiological processes are still poorly understood after traumatic spinal cord injury. The study is designed as a clinical prospective observational study measuring cytokine serum concentrations of patients suffering from acute traumatic spinal cord injury.

### Materials and methods:

Datasets from 138 patients affected by a TSCI were collected. We examined the serum levels of GM-CSF, IL-12p70, IL-2, IL-4 and IL-5 over a 12-week period, i.e., at admission and 4, 9, 12 hours, 1 and 3 days and 1, 2, 4, 8, 12 weeks after trauma. In our matched pairs design, 10 patients with SCI and neurological remission were matched with 10 patients with an initial ASIA A grade and no neurological remission. Ten patients with vertebral fracture without neurological deficits served as controls. Our analysis was performed using a Luminex Cytokine Panel. Multivariate logistic regression models were used to examine the predictive value with respect to neurological remission vs. no neurological remission.

### Results:

GM-CSF, IL-12p70, IL-2 and IL-4 were not detectable in peripheral serum. One week after injury IL-5 serum concentrations differ significantly regarding the criterion presence and absence of neurological remission ( $p=0.034$ ). The favoured predictive model resulted in an AUC of 88.9%. in the ROC analysis.

### Conclusion:

IL-5 examination provides predictive value for the remission after tSCI. Further studies with an elevated sample size should address this cytokine as a relevant covariate in predictive modelling for the criterion neurological remission. Thus IL-5 might provide additional information for future prognostic and monitoring techniques.



## **Initial serum selenium levels as possible protective factor for remission after traumatic spinal cord injury**

(Abstract ID: 868)

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### **Background:**

Selenium is reported to be a potential protective factor after acute traumatic spinal cord injury. The study is designed as a clinical prospective observational study measuring Selenium in the serum of patients suffering from acute traumatic spinal cord injury.

### **Materials and methods:**

The serum is examined right after the admission, four, hours, nine, 12 hours, as well as one, three days, one, two weeks, and one, two and three months after the injury. Interventions: Surgical decompression of the spinal cord was performed in all patients within two hours after the injury. Serum concentrations of selenium were measured with atomic absorption spectroscopy and multivariate logistic regression models were used to examine the predictive value of Selenium with respect to neurological remission vs. no neurological remission.

### **Results:**

The data present significant elevations of selenium in the remission group (G1) compared to the no-remission group (G0) at admission (0 hours) and 3 days after admission, as well as an elevated exposure during the first week after the injury.

### **Conclusion:**

The results strongly indicate selenium to be possibly an important neuroprotective factor in the spinal cord after injury.