Frequency of venous port explantation due to early infection or malfunction

(Abstract ID: 224)

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Background:

Totally implanted venous port systems are frequently necessary in patients with malignant disease for the administration of chemotherapy. Ports are explanted due to malfunction or clinical signs of infection in the early post-operative period or no longer need in the late period. Early need for explant may be attributed to technical failure or contamination during the implantation. In this study we investigated the early explantation rate of venous ports.

Materials and methods:

In a retrospective analysis of our clinically database we looked after the explantation rate and the time interval of venous port systems implanted and explanted at our institution between 2007-2016. We looked after early infection rate, malfunction and early thrombosis as cause for explantation in the first 30 days.

Results:

From a series of 2549 ports implanted at our institution 492 were also explanted.

54 ports (2%) were explanted during the first 30 days and of those 15 (0.6%) in the first two weeks postoperatively.

In 66% (36/54) of cases suspected infection of the port system (e.g. fever, positive blood culture, high inflammation parameters, local signs of infection) was the indication for explantation. Interestingly in only 20/36 (55%) of explanted devices microbiological testing was positive.

In the other 33% of cases, dislocation of the port system was the reason in 15 patients, port dysfunction in 2 patients and 1 patient suffered from an early line thrombosis.

Conclusion:

Due to standardised technique and careful implantation technique early explantation of port systems is rare. Only in a minority of patients infection can be proven by positive tests on the explanted device. Since patients are usually in need of port systems for chemotherapy, the indication for explantation for suspected infection has to be balanced carefully.
Twiddler’s syndrome: well-known in pacemakers, but new in port systems

(Abstract ID: 433)

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Background:

The aim of this study was to assess the incidence and clinical relevance of the subcutaneous dislodgement of totally implantable venous access ports (TIVAPs). This complication leads to inopportune device removal during ongoing therapy.

To our knowledge, there is no study, which investigated the incidence and clinical relevance of port subcutaneous dislodgement. So far, there are only a several case reports about this complication after TIVAP implantation.

Materials and methods:

For the period between 01.01.2013 and 16.09.2016, 523 TIVAD explantations were registered at our Department of Surgery. The data of 468 eligible Patients were analyzed descriptively.

Results:

Overall, 394 patients were included in this study. 178 (45,2%) patients underwent TIVAP explantation after the end of therapy, while in 216 (54,8%) the device was explanted due to the following complications: infection 142 (65,7% of all complications), mechanical malfunction 33 (15,28%), subcutaneous port dislodgement 20 (9,3%), thrombosis 16 (7,41%) and other reasons 5(5,31%) patients.

Table:

| Row Labels            | Count of Value |
|-----------------------|----------------|
| Infection             | 65.74%         |
| Thrombosis            | 7.41%          |
| Dislocation           | 4.63%          |
| Dislodgement          | 9.26%          |
| (blank)               | 9.26%          |
| Dislodgement Total    | 9.26%          |
| Dysfunction           |                |
| Catheter kinking      | 2.78%          |
| Flipped port          | 2.31%          |
| Leakage               | 4.17%          |
| Loop in VCS           | 0.46%          |
| Suture over the muff  | 0.46%          |
| Twisting port         | 0.46%          |
| Dysfunction Total     | 10.65%         |
| Others                |                |
| (blank)               | 2.31%          |
| Others Total          | 2.31%          |
| 1 Total               | 100.00%        |
Conclusion:

The reported rates of mechanical malfunction, according to papers based on the absolute count of explanted devices, are usually between 5.5% and 6.5% [4,6]. In our study, 9.3% of all complications that led to inopportune TIVAP explantation were indicated by port subcutaneous dislodgement. Device dislodgement was the most common mechanical complication. The incidence of this complication seems to be underestimated and requires further assessment. Besides being a reason for additional medical costs and reduction of patient’s satisfaction, the high incidence of port dislodgment should be considered when using vesicant chemotherapeutics. The subcutaneous extravasation of the letter can cause soft tissue injury [7].

Subcutaneous leads dislodgement is a rare, but well-known complication after permanent pacemaker implantation. Since the first description of this complication, as Twiddler’s syndrome, by Bayliss C. et al., many authors reported about it after pacemaker or defibrillator implantation [8]. Twiddler’s syndrome is a pacemaker malfunction due to leads dislodgement from their initial position in the heart caused by self-conscious or unconscious twiddling/manipulation of the pulse generator. The symptoms depend on the dislodged position of the leads and variate from loss of pulse generator function to abdominal pulsing (phrenic nerve stimulation) or rhythmic arm twitching (plexus brachialis stimulation).

The reasons for leads/catheter dislodgement are neither for pacemakers nor for TIVAPs known, but some predisposing factors for Pacemaker Twiddler’s syndrome are already defined (active manipulation/twiddling of the device, excessive movement of the upper limbs, obesity, large sized pockets for the generator) [9,10,11]. In our estimation, it is reasonable to consider the same factors predisposing to pacemaker Twiddler’s syndrome in port subcutaneous dislodgement.

In this series, mechanical malfunction was the second most common reason for device-explantation. Port subcutaneous dislodgement (Twiddler’s like syndrome) was a common complication, interestingly, so far only for pacemakers electrodes described but not for port catheters. The high incidence of this underestimated complication leads to additional medical costs and lower patient’s satisfaction. The factors predisposing to this complication must be further analyzed.
Port_Twiddler_Sydrom
Immunohistochemistry - Selective staining and software supplied quantification of antigenes in paraffin sections as a method for analysing expression of proteins

(Abstract ID: 413)

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Background:

The visualization and quantification of proteins and their distribution patterns in histological sections using immunohistochemistry (IHC) is a major challenge in histology.

The IHC is based on the immunological reaction between epitopes of an antigen and specific primary antibodies. The formed antigen-antibody complex is then detected in further steps.

In the present study, we investigated the expression of proteins in IHC staining that play a role in the "Unfolded Protein Response" triggered by stress on the endoplasmic reticulum.

The question covers the methodology for making paraffin sections and their objective quantification via IHC.

Materials and methods:

The IHC is performed on mouse spinal cord in paraffin sections of 4mm thickness.

First of all, dehydration is carried out in xylene, dehydration in descending alcohol series and neutralization of the endogenous peroxidase via H2O2. Antigen unmasking and blocking of non-specific antigens improve the signal-to-background staining ratio. This is followed by incubation of the specific primary antibody as well as a biotinylated secondary antibody directed against the primary antibody and treatment with streptavidin HRP. Streptavidin binds to the biotinylation of the secondary antibody and is associated with horseradish peroxidases (HRP). When incubated with a kit for colour development, such as the AEC kit or DAB kit, the HRP triggers a colour reaction.

This colour reaction maps the presence of antigens in the preparation. Finally, the remaining tissue is counterstained with haematoxyline. The specimens are photographed on a Leica photomicroscope (brightfield) and the photos are saved in tif-format.

The software "Fiji" is used for quantification. First, the region to be analyzed (ROI) is defined in the image and its area determined. The images are then processed in several steps in such a way that the IHC peaks can be selected and counted within the ROI. The counts are applied against the area of the ROI.

Results:

The disadvantages of manual analyses are the great amount of time and subjectivity of the process. An analysis via software shows a higher objectivity. Software programs cannot always detect all IHC single peaks or counts false positive peaks. This can happen, for example, in the case of fusioned single peaks or also in the case of too high non-specific background coloring.

Conclusion:

IHC staining is an important method in histological research to analyze tissue at the molecular level in the expression of proteins.

The correct application of IHC staining is essential to produce reliable and comparable preparations. In addition, the evaluation and counting of the stainings is decisive. Sections can be analyzed manually or by software. Both methods have advantages and disadvantages. Nevertheless, digital analysis has great potential and increases objectivity in generating data from IHC staining for the statistical description of protein expressions in tissues.
Surgical treatment of venous popliteal aneurysms

(Abstract ID: 516)

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Background:
Venous aneurysms are rare. They are usually published as case reports or case series. Their surgical treatment is various. The goal of this study is to develop a decision making support for surgical treatment of venous popliteal aneurysms.

Materials and methods:
Between 1993 and 2017 we diagnosed popliteal vein aneurysm in 35 patients, 28/35 (80%) received surgical treatment. The indication for operative treatment was based on duplex ultrasound. Patients received postoperative 3 months anticoagulation. All patients received clinical exam and duplex sonography after one week, 6 months and annually during follow up (2 - 282 months).

Results:
The most frequently performed operative procedure was tangential resection and direct suturing of the popliteal vein (25/28, 89%), in three patients with additional aneurysmorrhaphy. One patient received resection and patch-plasty and 2/28 (7%) received resection of the popliteal vein and end-to-end anastomosis. Postoperatively, 2/28 (7%) developed haematoma with indication for surgical evacuation. One permanent paresis after haematoma evacuation occurred. During follow up, only the patient with patch-plasty had restenosis with indication for reintervention (p=0.001).

Conclusion:
Surgical treatment of venous popliteal aneurysms is safe. In our series, patients treated with tangential resection and direct suturing had no restenosis.
Use of the STAT (Sutureless Telescoping Anastomosis Technique) to Facilitate Supraaortic Revascularization: Mid-Term Results

(Abstract ID: 678)

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Background:
We report the mid-term results of use of a sutureless telescoping anastomosis technique (STAT), the modification of technique initially described as VORTEC, for revascularization of supra-aortic vessels.

Materials and methods:
Between January 2009 and December 2004, 55 patients (37 males) with an aortic arch lesion underwent trans-sternal debranching with sutureless telescoping anastomosis. The underlying aortic pathologies were: isolated aortic arch aneurysm (10 patients), aortic arch aneurysm extending to ascending or descending aorta (26), subclavian artery aneurysm (3), traumatic aortic rupture (1), aortic dissection (10), and other arch pathologies as aortic ulcer of floating thrombus (5). Follow-up included computed tomography angiography at 1, 3, and 6 months postoperatively, and then annually.

Results:
Overall, 148 supra-aortic vessels in the 55 patients were revascularized: 127 by STAT and 21 by sutured surgical anastomosis. Immediate technical success was 100%. There was no early graft occlusion and late graft occlusion was detected in two patients. Perioperative mortality was 7.3% (one postoperative bleeding, one retrograde dissection, one MOF (multi-organ failure) and one cerebral bleeding). Mean follow-up (FU) was 45.12 months: 45 patients with FU more than 2 years, 36 more than 3 years and 23 more than 4 years. Patients’ cumulative survival at 4 years was 84%. There were no difference in patency rate between STAT and sutured anastomosis.

Conclusion:
Sutureless telescoping anastomosis technique (STAT) reduces technical difficulties and invasiveness of aortic surgery (reduces ischemia time, no clamping or circumferential dissection). This technique allows performing anastomosis where sutured anastomosis is challenging (dissection, intramural hematoma). Mid-term results confirm that sutureless anastomosis is safe and reliable alternative to sutured one.
Endovascular management of an iatrogenic subclavian arteriovenous Fistula after central line insertion

(Abstract ID: 698)

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Background:

Acquired arteriovenous (AV) Fistulas occur mostly after medical venous catheterization (e.g. central line insertion) or traumatic injuries and can present with a variety of symptoms, depending on their location and the magnitude of the collateral flow. Though its superiority is still disputable, endovascular therapy has been increasingly replacing the classical open surgical approach in the management of these complications.

Materials and methods:

We report a case of a 40 years old male who was presented to us with recurrent attacks of syncope and a suspicion of subclavian steal syndrome. Other than gallbladder surgery 20 years before, for which a central venous line was inserted into the right subclavian vein, the patient was completely healthy with no significant medical, family or social history.

Color Doppler imaging of the supraaortic vessels revealed a bruit artifact with an arterialized flow in the proximal segment of the right subclavian vein, suggestive of an arteriovenous Fistula. Further demonstration using CT-Angiography of the Thorax confirmed an AV-Fistula between the superior Vena cava und the right subclavian artery, with formation of a false Aneurysm from both sides.

Following an interdisciplinary discussion of the findings, the patient was consented for an endovascular treatment.

The right subclavian artery was cannulated using a retrograde brachial access, followed by a simultaneous cannulation of the superior Vena cava through the right common femoral vein. After blocking the venous part of the Fistula, the arteriovenous connection was occluded using embolisation spirals and Onyx® liquid embolic system. The spirals were then secured in place with an implantation of a self-expanding stent into the right subclavian artery.

The results of follow-up angiography were normal with no further signs of arteriovenous shunting. The Patient was then discharged with lifelong antiplatelet therapy with Aspirin.

Results:

The clinical and sonographic follow up showed a regular flow through the subclavian artery and a normal perfusion of the right arm. The complaints of the patient resolved completely. No vascular complications were observed in the access vessels.

Conclusion:

Despite their rarity, subclavian arteriovenous Fistulas remain a challenging pathology to treat. Due to its very invasive nature and the need for a thoracotomy in most of the cases, surgical repair is becoming increasingly obsolete and is being replaced by the less invasive endovascular approaches, which are themselves very rapidly developing. Nevertheless, further prospective studies and meta-analyses are required to establish the superiority of endovascular treatment.
Picture:

Pre-Intervention  Post Intervention
TrackCath System will revolutionize cannulation during endovascular procedures

(Abstract ID: 494)

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Background:
Cannulation is a challenging step in endovascular procedure, in particular in cases of contralateral gate of a modular stent graft, or target artery. A quick, effective but also safe manoeuvre, contributes to success of the procedure by reducing the irradiation and contrast medium volume. To this day, cannulation remains the challenge that limits the use of advanced endovascular techniques (parallel grafts, FEVAR, or BEVAR), which is why interventionist needs tool to facilitate cannulation.

Materials and methods:
The TrackCath System is a smart catheter system with two important technical characteristics. The first and unique part of catheter is a flow velocity sensor that measures the change of blood flow velocity within the aorta. This helps the internationalists to identify side branches ostia (high velocity at origin) with millimetre level accuracy (Figure 1). The second technical characteristic is side port, which enables cannulation the side branch with standard used catheter or guidewires. The catheter provides support for the cannulation and stability with the aorta.

The TrackCath System (developed by Mediria AG®, Winterthur) has gone through different design iterations and preclinical testing in tight collaboration with vascular surgeons at the University Hospital of Zürich. It went through animal trials as part of the NoCaTS project (E8212 Eureka-Eurostarts), and has now reached full technological maturity.

Results:
The TrackCath system has shown excellent feasibility, applicability, and accuracy to identify and cannulate arterial ostia in the animal model. The cannulation of renal and superior mesenteric arteries as well as of celiac trunk is straightforward under the guidance of the flow measurement of the TrackCath System. Standard angiography has confirmed for each cannulation the success.

The quantitative analysis of the images acquired during the trials confirmed an accuracy of identification of the side branches upper margin of 1 mm (± 2.19 mm), which is better than the accuracy achieved by current fusion imaging techniques.

Conclusion:
The TrackCath System is a highly accurate tool for the identification and cannulation of aortic side branches. The next steps will be the first use of the device in clinical practice. A request for approval has been submitted to the German authority.
Smoking is a significant risk-factor for postoperative cerebral events in CABG and simultaneous internal carotid endarterectomy

(Abstract ID: 313)

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Background:

Until 2008 all patients with significant stenosis of the internal carotid artery and scheduled heart surgery underwent simultaneous operation at the Medical University of Graz. Though by now simultaneous operations are restricted to neurologically symptomatic patients according to actual guidelines, the goal of this study was to determine factors that influence postoperative neurological outcome.

Materials and methods:

The study includes operations between January 1986 and April 2008. Final stroke classification at the time of discharge from neurological rehabilitation used the modified Rankin scale. Minor stroke was defined as Rankin 0-2, whereas disabling stroke for Ranking 3-6. The following parameters were tested for influence on perioperative central neurological deficits: gender, height, weight, BMI, grade of coronary heart disease, history of STEMI, NSTEMI, CPR or PTCA, grade of mitral, tricuspidal or aortic insufficiency, cardiomyopathy, grade of aortic stenosis, stable or unstable angina pectoris, history of cerebral events (TIA, stroke), hypertonia, NYHA classification, grade of carotid stenosis (by ultrasound and/or angiography), cardiac rhythm prior to and past surgery, ejection fraction prior to and past surgery, type of coronary bypass, count of coronary bypasses, simultaneous valve surgery, endarterectomy technique, carotid side, performing cardiac surgeon, performing vascular surgeon, length of stay, cardiopulmonary bypass time, smoking habits, cholesterol and triglyceride levels, blood glucosis, fibrinogen, renal function, type of diabetes, use of heart-lung machine.

The influence of the listed parameters on perioperative stroke rates was calculated with student-t-test, Fishers´s exact test or Wilcoxon rank sum test as suitable using SPSS23.0.0.0. P-values below 0.05 were considered significant.

Results:

273 patients underwent CABG with internal carotid endarterectomy. Mean age was 67.11 years (range 43.3 - 82.1), immediate postoperative central neurological deficits were detected in 7.0% (comp. table). Rankin values were 0 in 1.5% (4/273), 1 in 2.6% (7/273), 2 in 1.1% (3/273), 4 in 0.7% (2/273) and 5 in 1.1% (3/273). Thus minor stroke appeared in 5.1% (14/273) of cases whereas disabling stroke in 1.8% (5/273) of cases whereas smokers presented a 13.3% (14/273) event rate.

| Central neurological deficits                  | %    | n (of 273) |
|-----------------------------------------------|------|------------|
| total                                         | 7.0% | 19         |
| ipsilateral                                   | 5.5% | 15         |
| contralateral                                 | 1.1% | 3          |
| both sides                                    | 0.4% | 1          |

Conclusion:

Actual smoking habits before combined coronary revascularization and simultaneous internal carotid artery endarterectomy influence postoperative neurological outcome. Further studies are necessare to assess whether combined CABG and internal carotid endarterectomy are feasible in non-smokers.
Chronic mesenteric ischemia – treatment modalities and outcomes over a 13-year period

(Abbreviated ID: 705)

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Background:
Chronic mesenteric ischemia (CMI) is a rare cause of abdominal pain and therefore usually diagnosed at an advanced stage. We report on treatment modalities and outcomes of CMI patients, treated conservatively, by open-surgical repair (OR) and endovascular therapy (ER) of chronic lesions of the visceral arteries over a 13-year period.

Materials and methods:
Retrospective analysis of a clinical series of 82 consecutive patients with a clinical main diagnosis of CMI (ICD-10 K55.1, 76% ♀, mean age 67 ± 13 years), treated between January 2004 and May 2017. We evaluated clinical parameters, therapy and outcome. A follow-up (FU) took place after 6 weeks and then annual thereafter. Statistical tests included student-t-, Fisher EXACT- and Chi-square test.

Results:
Abdominal angina, weight loss and diarrhea were present in 64%, 46% and 18% of patients, respectively. The average time between first symptom onset and the beginning of therapy took 14.5 ± 7.3 months. 86% had no surgical or endovascular abdominal intervention in the past. 80% were already treated for a different vascular pathology. Comorbidities and risk factors consisted of coronary artery disease (38%), peripheral vascular disease (33%), arterial hypertension (60%), nicotine abuse (41%), hyperlipidemia (39%) and diabetes mellitus (26%).

The clinical diagnosis was confirmed by CT-Angiography(CTA) in 85% and intraarterial angiography or MR-Angiography in 15%. 59% of the patients suffered from a multiple vessel disease, whereas 41% had isolated lesions of the SMA or CA.

18 patients (23.2%, 69 ± 9 years) were treated conservatively, 39 patients (47.5%, 70 ± 12 years) underwent ER and 24 patients (29.3%, 61 ± 15 years) received OR. Essential decision criteria for treatment modalities were hemodynamic relevance, age, comorbidities and morphology of the lesion. From 2009 onwards, the ER rate increased from 50% to 83% (p=0.24).

The overall in-hospital mortality was less than 1% (1 Patient after OR). The overall length of stay on ICU and overall length of hospital stay was <1 day and 9 ± 13 days, respectively. The technical success rate was 90% after ER (96% after OR). In 62 patients (95%) clinical symptoms improved immediately. 1 patient at OR (4%) failed and 2 at ER (5%).

Comparing the treatment modalities, patients treated by OR stayed significantly longer (14.9 ± 17.6d vs 6.0 ± 6.7d, p <0.05) and had more complications (25% vs. 7.5%, p=.053) than patients with ER. Stenoses were treated primarily with ER (65%) There was no difference in treatment for multivessel disease (number of vessel ER 1,61 vs. OR 1,75) or occlusions (ER 50% vs OR 50%).

The FU (19.5 ± 32 months) showed similar PPR (OR 83%, ER. 77%, p=0.55) and SPR (OR 91,7% vs ER 92,3%) respectively.

Conclusion:
This study showed, that patients with chronic mesenteric ischemia can be treated successfully by a multimodal therapeutic approach. Proper patients selection for conservative, endovascular or open therapy is mandatory. ER was used more often in the last years and was associated with fewer complications, shorter stay in hospital and no in-hospital mortality. Primary and secondary patencies were similar, during FU of endovascular and open repair.
Open surgical repair for AAA - Will it ever be obsolete?

(Abstract ID: 681)

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Background:
Most AAA (abdominal aortic aneurysm) are treated by EVAR (endovascular aortic repair) today, especially in the elective setting. Nevertheless, the ability to perform OSR (open surgical repair) remains a much needed skill of a vascular surgeon for emergency procedures and re-interventions (e.g. for the explantation of infected stent-grafts). Since OSR intervention numbers are dropping, especially outside of high-volume centres, this study reviews if it is necessary to further provide the ability to perform OSR at smaller hospitals or will competence in EVAR be enough for emergency care of (ruptured) AAA’s in the future?

Materials and methods:
From 12/2007 to 1/2017 this retrospective, single-centre study at a regional hospital in Northern Germany (WKK Heide, SH) enrolled a total of 165 patients (w=16, m=149; mean age 71.4± 9.9 years) that were treated for AAA. The mean follow-up period was 32 months. Primary endpoints of this study were: in-hospital mortality and complication rate. Three cohorts were created: elective EVAR (eEVAR), emergency EVAR (emEVAR) and OSR.

Results:
N=128 patients were treated by eEVAR, n=37 patients were treated for a ruptured AAA with 25 of those by OSR and 12 by emEVAR. There was no elective OSR performed during the period. Annual numbers of OSR fluctuate over the years with no significant drop over time (on average 2.8/a). First results show that in-hospital mortality and complication rate. Three cohorts were created: elective EVAR (eEVAR), emergency EVAR (emEVAR) and OSR.

Results:
N=128 patients were treated by eEVAR, n=37 patients were treated for a ruptured AAA with 25 of those by OSR and 12 by emEVAR. There was no elective OSR performed during the period. Annual numbers of OSR fluctuate over the years with no significant drop over time (on average 2.8/a). First results show that in-hospital mortality of the groups is comparable to results/statistics from other German hospitals: eEVAR= 2.3%, emEVAR=25% and OSR=20%. In the eEVAR group single most minor complication was an Aneurysma spurium at the puncture location (groin/arm) with a total of n=19. Endoleakage as a procedure-associated complication occurred in 33.3% of emEVAR and 15.9% of eEVAR cases. Most endoleaks were closely monitored without the need for re-intervention. Kaplan-Meier analysis shows an early survival advantage of OSR vs. emEVAR in the first 2.5 years, afterwards survival time converges.

Conclusion:
OSR is an intervention every vascular surgeon needs to be able to perform in an emergency because referral and transport to the nearest specialized centre or emEVAR is not always possible. Open surgery is an indispensable alternative to emergency EVAR with an early survival advantage. Currently emergency treatment for AAA’s at this regional hospital holds no higher risk of in-hospital mortality compared to other studies, most likely due to the knowledge of the employed staff, but this is about to change due to pressure on the current health care system. Measures to ensure proper hospital funding and skill-teaching to perform OSR have to be put in place to guarantee emergency capabilities in the future.
Successful interfaculty cooperation in teaching

(Abstract ID: 862)

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Background:
Against the background of the steadily decreasing interest in a specialist training in a surgical subject, the early motivation of the students during the studies is eminent. The design of the surgical block practice in the fourth year of studies is a very good platform for inspiring students for surgical subjects. As a result, many medical faculties already have tried-and-tested concepts for imparting practical skills, with the help of which students can be enthusiastic about surgery early on. Little is known about how and how such existing concepts can be transferred to other faculties.

Against this background, we have evaluated and further developed a concept for training practical skills (TpS), developed at the Goethe University in Frankfurt, regarding the transferability to the local possibilities at the Guericke University Magdeburg.

Materials and methods:
In addition to the teaching of the lessons, which now only takes one week after the restructuring, all students now complete a one-week training of practical skills in SkillsLab. A total of 10 modules were developed or adapted for the Magdeburger SkillsLab. In this way, the students learn important surgical basic skills as well as communication in the surgical context in accordance with the Frankfurt SkillsLab-Week. The training in SkillsLab is carried out in a realistic manner in green surgical clothing and interdisciplinary with the OTA students at the technical school.

Uniform mandatory lecturer manuals and annual lecturer training ensure a uniform training for all students at a high level.

Finally, the skills learned are finally tested by an OSCE, and stations between the locations have also been exchanged. Overall, the implementation of an existing, complex course is possible at a different location, but the fine-tuning of the individual modules requires adaptations to the learning objectives of the respective faculty-based learning target catalog and coordination with the contents of already existing courses.

Results:
This new surgical block study consisting of a TpS week followed by a clinical week is evaluated by the students. The first consistently positive resonances are very promising. The overall evaluation of the surgery in the faculty salary rose in Magdeburg from the grade 3,6 to 1,9 within 2 years after the implementation of the new block practical.

Conclusion:
This strengthens us in our time-consuming commitment to improving the teaching of surgery despite the extremely tense staff and financial situation.