Abstract

OC101

Vacuum-Assisted Suction Thrombectomy for Salvage of Failing Arteriovenous and Hemodialysis Reliable Outflow Grafts

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Background: The aim of the study was to determine the safety and feasibility of vacuum-assisted suction thrombectomy for restoring patency to thrombosed hemodialysis reliable outflow (HeRO) and conventional arteriovenous (AV) grafts. **Methods:** Between December 2016 and August 2017, 11 consecutive patients (6 males, average age 63, and range: 39–80 years) with thrombosed HeRO ($n = 7$) or AV ($n = 5$) grafts underwent percutaneous thrombectomy procedures using the Penumbra® CAT 8® or CAT D® (Alameda, CA, USA) suction thrombectomy catheter as the primary device to clear the venous outflow tract or limb before pulling the arterial plug with a compliant balloon. A total of 21 hemodialysis de clot procedures using suction thrombectomy were documented and analyzed. Average procedure length and fluoroscopy time, length of thrombus cleared, blood loss, complications, and primary patency were recorded and compared to the same patient's previous thrombectomy procedures. **Results:** All procedures were technically successful (100%) at restoring graft patency; however, reocclusion within 5 days occurred in 4 (19.0%) cases. Three (14.3%) interventions required additional balloon maceration or sweep to clear the venous outflow following thrombectomy. Average thrombus length treated by suction thrombectomy measured 21.1 cm (range: 12–27 cm). Average blood loss was 162.6 mL (range: 50–250 mL). No procedure-related complications were recorded. The average procedure length and fluoroscopy time using suction thrombectomy were 74.7 and 14.2 min, respectively, compared with 82.0 and 14.0 min, respectively, in the previous thrombectomy procedures using standard methods ($P > 0.05$). **Conclusion:** Vacuum-assisted suction thrombectomy is a safe and feasible method for removing thrombus and restoring patency to thrombosed AV and HeRO grafts.

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Multicenter European Experience in the Use of the Indigo Vacuum-Assisted Thrombectomy System in Acute Limb Ischemia

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Background: Percutaneous thrombectomy in patients with acute critical limb ischemia (CLI) is a challenging task. Several

devices have been approved for this indication, but their effectiveness remains a matter of debate. The aim of this study is to present the first European experience with the Indigo aspiration thrombectomy system. **Methods:** A retrospective case review of all patients treated with the Indigo system between January 2016 and May 2017 in four European centers was conducted. The inclusion criterion was acute (≤ 14 days) lower limb ischemia. No exclusion criteria were used. Primary outcome was defined as technical success with restoration of antegrade blood flow without the need for thrombolysis or alternative revascularization strategies. Secondary outcomes included in-hospital serious adverse events (myocardial infarction, stroke, or death), need for blood transfusion, and in-hospital re-intervention. **Results:** Sixty-five cases of acute CLI were included in this study with 12-month follow-up. Technical success was achieved in all cases and for each treated vessel segment. No blood transfusions were required. No perforations, dissection, or neurovascular damage were encountered. Median in-hospital stay was 2 days. One patient died during in-hospital stay due to heart failure and one patient suffered a myocardial infarction; both cases deemed to be unrelated to the procedure. On follow-up, 30-day reocclusion rate was 4% (from underlying primary causes such as AF). In these cases, repeat thrombectomy with the Indigo device was successfully performed. No episodes of reocclusion were reported on 12-month follow-up. **Conclusion:** In our experience, the Indigo system with its versatile range of catheters provides an easy, safe, robust, and trackable thrombectomy system in acute CLI cases with the capability to extract thrombus down to the pedal arch and without recourse to thrombolysis.

OC103

Ultrasound-Guided Central Venous Access Application in the Neonatal and Early Pediatric Intensive Care Unit (Single-Center Experience in 1000 Patients)

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Background: Central venous (CV) access is mandatory in pediatric and neonatal Intensive Care Unit (ICU) allowing resuscitation for intravascular fluid and various medication injections as well as a mean for hemodynamic monitoring. Jugular vein catheterization is the most common central vein accessed followed by the femoral which is despite being safer carries higher incidence of thromboembolic and infectious complications. The ultrasound guidance can both increase the success rate and decrease the procedure-related complications. **Methods:** From March 2014 to November 2017, ultrasound-guided CV line (CVL) was applied in 1016 patients in the Ain Shams University Hospitals' ICU (median age: 3 months [0–24] months), neonates 0–28 days ($n = 423$), and pediatrics below 24 months ($n = 539$). The sites of cannulation were the right internal jugular vein (IJV) in 65.3% of the patients, left IJV in 23.2%, right femoral vein in 7.9%, and left femoral in 3.5%. Interventional radiology residents on duty applied 3, 4, or 5F double lumen CV catheter according to patient's age and weight under local anesthesia. Under transverse view 10 MHz ultrasound transducer, Doppler was done to identify

the vein from the adjacent artery whether carotid or femoral; after proper sterilization, the transducer center was placed over the center of the vein. Cannulation is then performed using classic Seldinger technique. **Results:** Cannulation was successful in 98.2% of cases. Right IJV was always attempted first followed by left IJV followed by either femoral with no preference. There was no significant difference in technical success between the two groups. Carotid puncture happened in nine cases, eight neonates, and one pediatric patient in whom the catheter was applied to the artery and developed a transient ischemic attack after antibiotic injection to the artery which resolved spontaneously. One case developed hemopneumothorax treated by chest tube application and also resolved. **Conclusion:** Ultrasound-guided CV line is rather safe and feasible compared with published series on blind technique with higher overall success and a lower rate of complications.

OC104

Fistula Access Site Hemostasis: a Sticky Solution to a Bloody Problem

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Background: Histoacryl (glue) is well established as an agent for hemostasis for small subcutaneous lacerations and wounds in the emergency department. We translate this well-established technique into the interventional radiology world, using it for achieving hemostasis of hemodialysis arteriovenous fistula (AVF) access sites after percutaneous interventions. We audit the effectiveness, safety, and patient acceptability of this technique to conventional suturing closure methods. **Methods:** We carried out an audit of the use of skin adhesives (Histoacryl®) to close fistula access sites versus conventional surgical suturing in our large tertiary care center where there is a variety of different preferred techniques on wound closure. Thirty-nine procedures were performed on 33 patients who underwent percutaneous intervention of failing or thrombosed AVFs. In total, there were 39 access sites. Postprocedure hemostasis was achieved using Histoacryl® on 25 access sites, while surgical suturing was used for 14 access sites. Procedure details, including time to hemostasis, size of access sheath, dose and time of heparin administration, immediate complications, and patient self-reporting numeric pain intensity scale (0–10), were all recorded. **Results:** Histoacryl® group had a mean pain rating of 0.4 (standard deviation [SD] 0.7), and the suturing group had a mean pain rating of 2.6 (SD 0.7). Meantime to achieve hemostasis was 92 s in the Histoacryl® group (range: 20–601 s) and 198 s in the suture group (range: 58–361 s). No immediate complications were reported in either group. **Conclusion:** This audit has shown that Histoacryl® offers a fast, technically simple, device/suture-free, and painless technique for acquiring hemostasis after AVF intervention.

OC105

Sandwich Technique for Complex Aortoiliac Aortic Aneurysms

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Background: Common iliac artery (CIA) aneurysm is commonly associated with abdominal aortic aneurysm in about 40% of patients. It is preferable to preserve the internal iliac artery (IIA) whenever feasible. Intentional occlusion of an IIA during endovascular aortic repair (EVAR) results in new-onset buttock claudication and erectile dysfunction in ~28% and 17% of patients, respectively, and bilateral internal iliac occlusion is associated with increased risk of pelvic ischemic complications. Buttock claudication symptoms may improve over time but persist in more than half of affected patients 1 year after EVAR and can have a significant negative effect on patient quality of life. Fortunately, the more serious and potentially life-threatening complications of colon ischemia, pelvic necrosis, and spinal cord injury are less common, affecting ~1% of patients. **Methods:** There are many endovascular techniques to preserve the IIA. The most common one is using iliac branch endoprosthesis. However, in emergency situation, sandwich technique using parallel graft can be done easily. Unfortunately, no sizing formula has been used to determine the size of the parallel graft. Using mathematical calculation, we came up with specific formula to help in the sizing of the chimneys and decrease Type III endoleak. **Results:** Area of CIA graft = Area of EIA + Area of IIA ($\pi r_{cc}^2 = \pi r_{EE}^2 + \pi r_{II}^2$) ($CC = EE + II$) (Radius of CIA: C radius of EIA: E radius of IIA: I). Also we have to add 4 mm the fabric thickness $E = 10/2 = 5$ mm $I = 8/2 = 4$ mm. So, $CC = 25 + 16 = 41$ C = 6.4 mm. CIA graft has to be $6.4 \times 2 + 4 = 16.8$ mm CIA graft has to be $6.4 \times 2 + 4 = 16.8$ mm **Conclusion:** We feel this formula for sizing the chimneys for iliac aneurysms will decrease the Type 1b endoleak.

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Management of the Left Subclavian Artery with Thoracic Endovascular Aortic Repair

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Background: The thoracic endovascular aortic repair (TEVAR) for aortic aneurysm and dissection has shown its superiority to open surgery. In 26%–40% of patients, the proximal sealing zone beyond the left subclavian artery (LSA) had inadequate length that led to LSA coverage. The practice guidelines in this situation to decide about the revascularization are based on low-quality evidence, and there is limited literature that guides us to optimal revascularization techniques. The purpose of this study was to compare outcomes of LSA coverage during TEVAR without and with revascularization using different surgical techniques. **Methods:** We performed a single-center retrospective cohort study of 80 patients who underwent TEVAR from 2008 to 2017. The LSA was covered to obtain an adequate proximal landing zone, and a selective LSA revascularization by subclavian-carotid transposition and chimney technique was employed. Stroke, spinal cord ischemia, upper extremity ischemia, vertebrobasilar insufficiency, primary patency of revascularization, and nerve injury were compared. **Results:** The origin of the LSA was covered in 11/80 patients and revascularization in 10/80 patients. Median follow-up was 46 months in the covered group and 36 months in revascularized group. There were no major complications in LSA covered group and only some local