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

Osman Ahmed, Sreekumar Madasser, Patrick Tran, Derek Heussner, Jordan Tasse, Ulku Cenk Turba

Rush University Medical Center, Chicago, US.
E-mail: osman1423@gmail.com

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

Abdulrahman Alvi, Bella Huasen¹, Alexander Massmann², Stephen D'Souza¹, Theodosios Bidas³

Queens Hospital, Romford, ¹Royal Preston Hospital, Preston, UK, ²Saarland University Medical Center, Faculty of medicine, University of Saarland, Hamburg, Germany, ³St. Franziskus-Hospital, Munster, Germany.
E-mail: arjalvi@gmail.com

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.

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

Zeinab Aly Moussa Aly, Karim Abd El Tawab

Ain Shams University Hospital, Cairo, Egypt.
E-mail: zeinabalyoussa26@gmail.com

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