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Single Centre Experience Using Ekos-Catheter-Directed Thrombolysis in the Management of Acute Sub-Massive Pulmonary Embolus

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Background: Acute pulmonary embolism (PE) results in approximately 150,000 deaths per year in the United States. Massive PE results in haemodynamic instability. Patients with a sub-massive PE have a large embolus burden with evidence of right ventricular dysfunction (RV/LV ratio >0.9) but are haemodynamically stable. A Lancet review estimates the 3-month mortality rate for sub-massive PE is 21%. The treatment for massive PE is systemic intravenous tissue plasminogen activator (tPA) therapy. A beneficial reduction in all-cause mortality in these patients is attenuated by the 3-5% risk of catastrophic intracerebral haemorrhage. For haemodynamically stable patients with sub-massive PE, the current standard of care is anticoagulation. Our institution presents three patients with acute sub-massive PE managed with EkoSonic (EKOS) acoustic pulse thrombolysis, a form of ultrasound-enhanced catheter-directed thrombolysis (UE-CDTR). This combines conventional catheter directed tPA thrombolysis with high-frequency ultrasound, which increases thrombus permeability via acoustic cavitation for increased tPa efficacy. **Methods:** Three patients with CT pulmonary angiography (CTPA) confirmed sub-massive PE with RV dysfunction and a positive biomarker of cardiac strain (BNP/Troponin) underwent EKOS. Under local anaesthetic and via common femoral vein approach, EKOS endovascular systems were placed in either one or both lower lobe pulmonary arteries. A tPA bolus followed by infusion (0.5 mg/hr tPA) was commenced according to protocol. **Results:** At 4 hours, all patients had a reduction in resting heart rate and a reciprocal improvement in oxygen requirements. Repeat CTPA at 24 hours following initiation of EKOS-directed thrombolysis demonstrated significantly decreased thrombus burden (up to 75%) and radiographic resolution of RV dysfunction with no episodes of major haemorrhage. **Conclusions:** Our institution has successfully employed EKOS-directed thrombolysis in three patients with sub-massive PE. All patients had clinical and radiological improvement with reduced inpatient stay compared to patients treated with anticoagulation alone.

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Role of Interventional Radiology in Challenging Vascular Access for Pediatric Patients

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Background: The purpose of this study is to determine the technical and functional aspects concerning image guided peripherally inserted central catheter (PICC) and central venous catheters for challenging vascular access in pediatric patients. **Methods:** This prospective study done including 20 pediatric patients, 10 patients of them undergo peripheral inserted central catheters while, the other 10 patients undergo traditional CVCs using ultrasound and/or fluoroscopy guidance for different indications. **Results:** Venous access devices were successfully provided for 20 patients. There were 12 males (60%) and 8 females (40%) with a mean age of 4.91 years (range, 0-15 years). The right internal jugular vein was targeted for 6 cases (30%); 3 patients coming for BMT and 3 patients on regular hemodialysis. The left internal jugular vein was used for 3 cases (15%). The right subclavian vein was used in 1 case (5%) with end stage renal disease and the right internal mammary vein was used in 1 case (5%) on regular haemodialysis. The left femoral vein was used for 5 patients (25%) and the right femoral vein was used for 2 (10%) PICC lines with multisystem organ failure. Technical success in all patients. **Conclusions:** Image guided venous access success is considered as a feasible, safe and valuable option for central venous access in pediatric patients.

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Carbon Dioxide as Alternative Contrast Agents for Diagnostic Angiography and Vascular Interventions

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Background: To evaluate the role of CO2 contrast agent for diagnostic angiography and vascular interventions as an alternative to the iodinated contrast in the in patients with renal failure or severe allergic reaction. Carbon dioxide (CO2) was used as a contrast agent particularly in patients who were hypersensitive to iodinated contrast material or whose renal function was compromised since years. Recently with the availability of high-resolution DSA and a reliable gas delivery system CO2 angiography has become widely used to guide various vascular interventions, including angioplasty and stent placement. **Materials and Methods:** In 2016, 28 patients were examined with CO^2 angiography in our department, about 20% of them underwent above Knee angioplasty. All of the patients had contraindication to use the iodinated contrast, critical renal function, previous sever reaction to iodinated contrast. Most of the angiography was done through transbrachial approach, selective CO^2 angiography of the iliac, femoral and below knee arties were done. For the angioplasty in the iliac artery selective transbrachail angioplasty was performed, for the angioplasty in the femoral and below knee arteries ipsilateral antegrade approach was performed. The image summation techniques was used to improve the quality and accuracy of the angiography image. **Results:** 5000 unit heparin were given to all patients who underwent angioplasty, no heparin was given to the diagnostic angiography. The most important complication was pain experience during CO^2 injection; to decrease the pain during the procedure we decrease the injection rate, increase the time between each injection. **Conclusions:** The use of CO^2 contrast agent for diagnostic angiography and vascular interventions for the iliac, femoral and popliteal arteries in patients who have a contraindication to iodinated contrast materialseems to