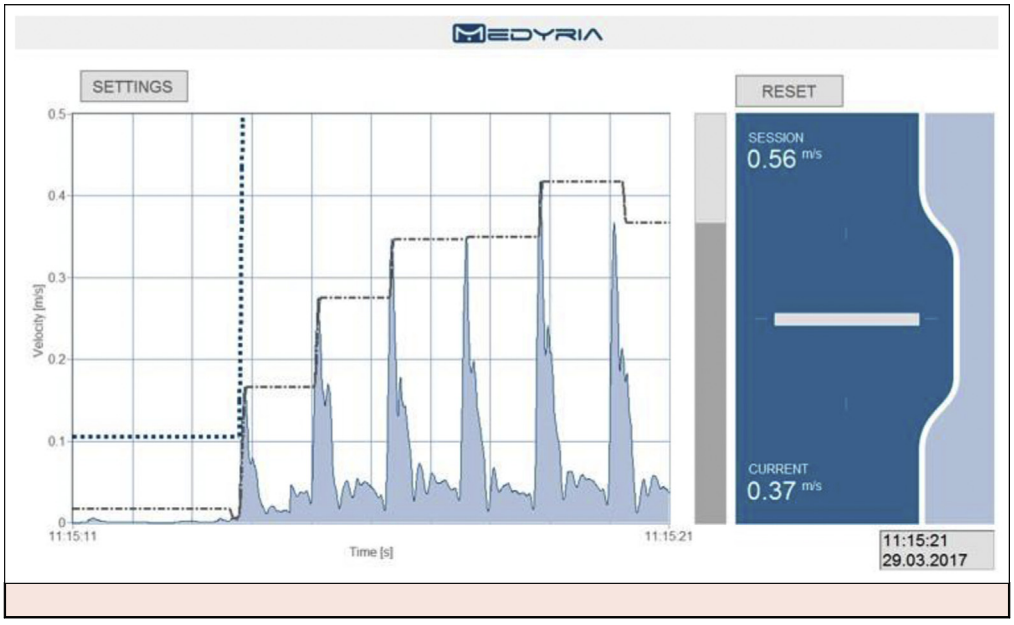

Conclusion: *Track Cath System* is a highly accurate tool for the identification and cannulation of aortic side branches. Next steps involve testing *Track Cath system* is currently being tested in clinical practice.

P-201 Creation of 3D Printed Anthropomorhic Venous Flow Phantoms on the Basis of Magnetic Resonance Imaging

Venous Diseases (Including Malformations)

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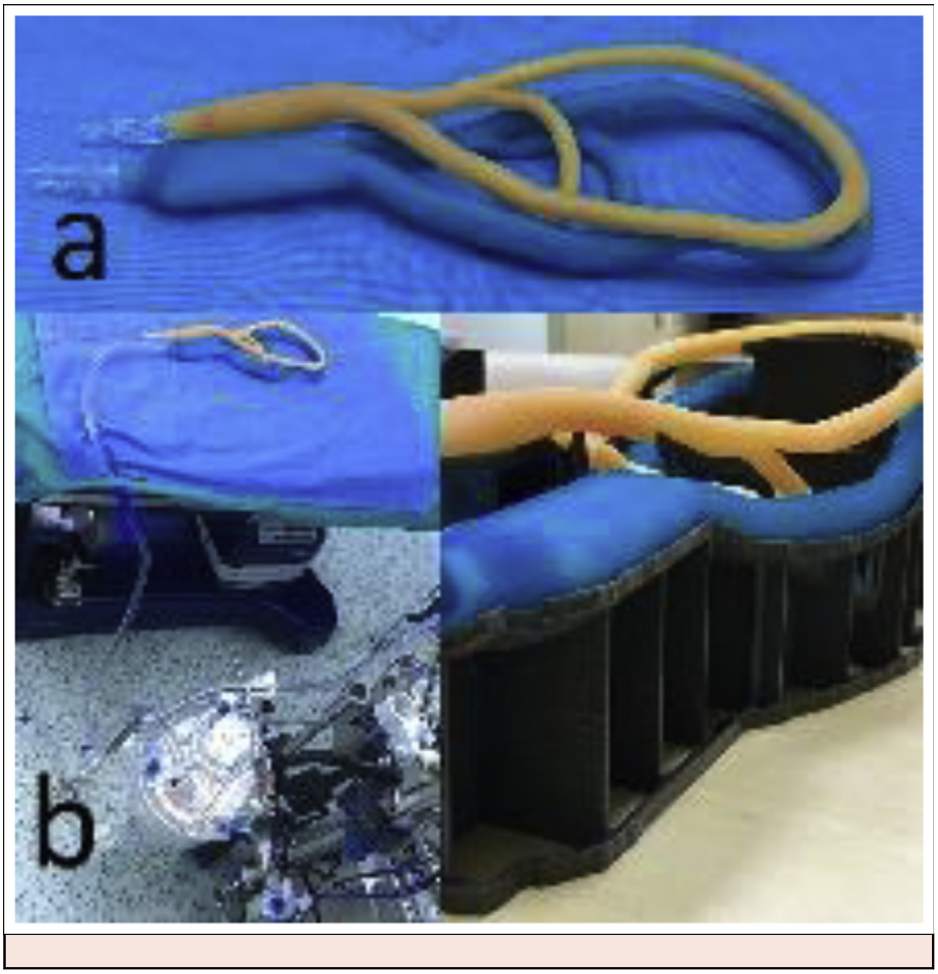
Introduction: It is challenging to reproduce a flow model which can simulate hemodynamic conditions in normal, pathological and post-intervention situations of the caval, iliofemoral tract. To overcome the limitations of existing bench tests, a novel approach was applied to make flow analysis possible, as well as the investigation of stent properties used in patients. An advanced 3D printer was used to translate magnetic resonance imaging (MRI) into creating a closed venous flow phantom with an arterial component.

Methods: Thin sliced 3D volumetric MR venography images were converted into 3D images using a special software program (Mimics, Materialise, Belgium). Inferior vena cava and abdominal aorta were selected from the lower region of diaphragm and 8 cm above the distinction of the left and right common iliac arteries and veins for modelling the upper part of the vessel pattern. The circuit was closed by joining the contralateral internal and external iliac veins and arteries. A small arterio-venous fistula was created between the distal loops. The open upper part of the vessel pattern was modelled to fit the connection to the tubing set of the heart-lung machine. On the MRV images, vessels are seen as solid structures. In order to create a lumen, a special process was required to eviscerate the inner part of both arteries and veins. Manufacturing process was completed with an advanced 3D plastic printer (Objet 750, Stratsys Ltd, Israel) which can give different shore values and color codes using acrylic resin as a raw material Prior to printing, shore values were selected separately for vein and artery in order to achieve the desired level of flexibility. Selection of the shore values and color codes were made by a computer program (GrabCAD, Cambridge, USA). Manufacturing process was completed in approximately 22 hours preceding a 24-hour curing process and cleaning. (Figure 1a)The model was connected to a roller pump Heart-Lung machine (Stockert S5, Sorin,Germany) using a tubing set(Bicakcilar, Turkey) (Figure 1b) and the closed circulation system was tested first for model leakage. Consequently venous flow was connected to a reservoir to test if the model could withstand both arterial and venous physiological pressures. Pulsatile flow was used during the experiments by using saline solution.

Results: The 3D artery and vein model showed no leakage and could withstand desired physiological arterial and venous pressure levels with pulsatile flow at various flow rates.



Conclusion: This preliminary venous model with arterial component proves that high resolution MRI scans can be successfully translated and adapted for 3D printing. This makes it possible to create models for in vitro bench testing, so that venous flow in normal as well as pathological circumstances and the effects of intravenous stenting can be evaluated. Flow parameters such as volume, pressure gradients can be quantified. Diagnostic tools such as duplex ultrasound can be applied to validate in vivo circumstances. The models can be modified to allow for flow visualization. 3D models can also be elaborated to facilitate training.

P-202 Open Axillary Access for Complex Endovascular Aortic Repair; A UK Tertiary Centre Experience

Abdominal Aortic Diseases

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Introduction: Complex endovascular aortic repair is frequently performed using concurrent axillary artery access; this can offer a favourable trajectory for the cannulation of the caudally-orientated visceral vessels. However, associated cerebrovascular complications are reported to be between 2 and 15%. Furthermore, it is hypothesised to be greater with right-sided axillary access due arch manipulation across the origins of the cerebral vessels. The experiences of a UK tertiary centre were reviewed to assess the morbidity associated with axillary acce

Methods: A retrospective analysis was performed to identify cases of open axillary exposure for complex aortic endovascular repair. Right-sided access was preferentially utilised unless there was arch disease or the left was unavailable. The primary endpoint was clinical cerebrovascular complication and the secondary endpoint was local access complications.

Results: A total of 177 complex endovascular aortic repairs performed between 2009 and 2018 were reviewed. 63 underwent open axillary exposure (44male:19female), with a mean age at intervention of 72.4(8.35 s.d.)years. Right-sided access was performed in 46 cases.

There were no cerebrovascular complications.

5 local complications occurred. Two incidences of haematoma requiring surgical intervention (1 right, 1 left). 2 cases of limited right sided dissection and 1 dissection causing asymptomatic occlusion.

Successful visceral cannulation was achieved in all cases.

Conclusion: This case-series demonstrates that open axillary access is safe. In particular right-sided access