E-094 A COMPARISON OF CLINICAL AND RADIOLOGICAL OUTCOMES BETWEEN TARGET 360 NANO AND MICROPLEX HYPERSOFT 3D USED AS FINISHING COIL

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Aim This study aimed to compare the clinical outcomes of Target 360 nano (TG) and Microplex hypersoft 3D (MH) used as a finishing coil (FC).

Material and Methods From January 2018 to December 2020, we retrospectively reviewed 243 coil embolization procedures performed using TG (n=152) and MH (n=91) coils of 1 mm x 2 cm the same size as FC. Further, the clinical and radiographic results were compared by matching the propensity score between the two groups.

Results There were no statistically significant differences in the clinical and angiographic results of the two coils after the propensity score matching. Successful occlusion was 89% and 86.8% and FC insertion failure was 20.9% and 28.6%. There were no differences in procedure-related complications and recurrence between the groups during the eight months follow-up period (3.3% versus 4.4% and 4.4% versus 3.3%, respectively). We also compared two subgroups of failed FC insertion (19 of TG and 26 of MH). The number of angled catheters was significantly higher in the failed TG group than in the failed MH group.

Conclusions There was no statistically significant difference between the clinical and radiological outcomes of TG and MH used as FC. However, in the FC insertion failure subgroups, the number of angled catheters was significantly higher in the TG failed group than in the MH failed. It was experimentally confirmed that the angle change of microcatheter tip with a large angle was large; however, further studies are required.

Disclosures D. Lee: None.

E-095 ACCELERATED ASPIRATION WITH Q CATHETER: AN IN VITRO STUDY

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Background and Purpose Thrombectomy in distal, medium vessels is a topic of increasing interest. To date there are few *in vitro* studies focused on performance of ≤ 5F catheters in medium vessels. The purpose of this study is to compare the performance of the 3F, 4F, and 5F MIVI Neuroscience Q Catheters versus Penumbra 3F, 4F, and MicroVention Sofia 5F Catheters.

Methods Using *in vitro* methods, we assessed and compared the following parameters: aspiration flow rates, clot uncorking forces, impulse, and clot ingestion. For flow rate, each aspiration catheter was immersed in a cylindrical container. Flow rate at one second was used to calculate impulse. For clot uncorking force, the force required to disengage a catheter from a simulated clot was recorded. For ingestion, we measured the time to ingest soft and medium stiffness synthetic clots.

Results The measured flow rates without a stent retriever for the Q3, Q4 and Q5 catheters were 3.54 ml/s, 5.32 ml/s and 6.87 ml/s. The measured flow rates without a stent retriever for the 3MAX, 4MAX and 5Fr Sofia were 1.46 ml/s, 2.56 ml/s and 1.73 ml/s. The impulse calculated for one second was 26 mNs for Q5 vs 9 mNs for Sofia 5, 35 mNs for Q4 vs 15 mNs for 4Max and 35 mNs for Q3 vs 9 mNs for 3Max. The average system ingestion for Q was significantly faster than the competitive catheters.

Conclusions The Q catheters demonstrated higher flow rates, higher uncorking force, and faster complete clot ingestion than competitive catheters.

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E-096 FAILURE MECHANISMS OF RADIAL ACCESS CATHETERS OBSERVED IN A FLUOROSCOPIC AND ENDOSCOPIC STUDY IN HUMAN CADAVERIC MODEL

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Background Endovascular device effectiveness and safe use rely on closely simulating real-world scenarios during preclinical testing. This study mainly focused on endoscopic evaluation of radial access catheter failure mechanisms tested on human cadaveric models.

Methods A human cadaveric model was created by catheterizing the ascending and descending aorta in a cadaver model consisting of the head, neck, bilateral arms, and torso. An endoscopic camera was inserted through the ascending aorta to evaluate radial access catheter performances. Blood-mimicking fluid was circulated in the cadaver model using an external pump. Bilateral radial access was obtained using 7F slender sheaths. All catheters were tested by a senior neurointerventionist, and during the procedures, all movements of catheters were recorded endoscopically. All recorded videos are evaluated by experienced neurointerventionists to find out possible failure mechanisms of radial access catheters.

Results We identified four possible failure mechanisms associated with current-market radial access catheters. These failure mechanisms were simultaneously demonstrated through endoscopic and fluoroscopic imaging. They include insufficient torque transmission, catheter whipping due to torque build-up, scratching atheroma plaques during catheter advancement, catheters getting stuck during advancement by the septum between the brachiocephalic trunk and the left common carotid, and catheters becoming lodged on the edge of the inner vascular layer. All failure mechanisms were documented through endoscopic and fluoroscopic recordings.

Conclusions The development and optimization of radial access catheters are necessary. Visualizing possible failure mechanisms will contribute to a better understanding of these failure mechanisms and enable the development of more effective catheters.