Covidien. 6; C; Medtronic, Covidien, Stryker, Neuravi, Brains-Gate, Pfi zer, Bristol-Myers Squibb, Boehringer Ingelheim.

P-011 IMAGING AND HISTOPATHOLOGY OF THROMBI IN ACUTE ISCHEMIC STROKE: SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and purpose There has been growing interest in the imaging and histopathology of retrieved thrombi after the introduction of mechanical thrombectomy for the treatment of acute ischemic stroke. We conducted a systematic review and meta-analysis of imaging and histological characteristics of thrombi in acute ischemic stroke.

Materials and methods We identified all studies published between January 2005 and December 2015 that reported findings related to the histological and/or imaging characteristics of thrombi in patients with acute ischemic stroke secondary to large vessel occlusion. The five outcomes examined in this study were 1) the association between histological composition of thrombi and stroke etiology, 2) the association between thrombi histological composition and angiographic outcomes, 3) the association between imaging and histological characteristics of thrombi in stroke, 4) the association between imaging characteristics of thrombi and angiographic outcomes and 5) the association between imaging characteristics of thrombi and stroke etiology.

Results There was no significant difference in the proportion of RBC rich thrombi between cardioembolic and large artery atherosclerosis etiologies (OR = 1.62, 95% CI = 0.1–28.0, P = 0.63). Patients with hyperdense artery sign had a higher odds of having RBC rich thrombi than those without a hyperdense artery sign on CT (OR = 9.0, 95% CI = 2.6–31.2, P < 0.01). Patients with a good angiographic outcome had a mean HU of 53.0 compared to a mean HU of 47.3 for patients with a poor angiographic outcome (MSD = 5.6, 95% CI = 1.1–10.0, P = 0.02). There was no association between imaging characteristics and stroke etiology (OR = 1.13, 95% CI = 0.32–4.00, P = 0.85).

Conclusions Hyperdense artery sign is associated with RBC rich thrombi and improved recanalization rates. Further research is needed to determine the association between thrombi composition and stroke etiology as well as revascularization outcomes.

Disclosures W. Brinjikji: None. **S. Duffy:** 5; C; Neuravi LTD. **D. Kallmes:** None.

P-012 LONGER WORKING LENGTH OF THE SOLITAIRE RETRIEVAL DEVICE IMPROVES REVASCULARIZATION

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Introduction/purpose Endovascular treatment using stent retrievers are now the standard of care in patients with acute ischemic stroke due to proximal middle cerebral artery occlusion. Recent randomized clinical trials have shown stent retriever recanalization rates (TICI 2 b or higher) surpassing 80%. The Solitaire stent retriever is available in different diameters and lengths. More recently, in August 2014, a 4 × 40 device was made available for thrombus retrieval in the US. While there have been many studies comparing the Solitaire to the other mechanical thrombectomy devices, at present, there have been little to no human data comparing the relatively new 4 × 40 Solitaire device with the older 4 × 20 and 4 × 15 devices. In our presentation we will be looking at the cases in which the 4 × 40 device was deployed and compare the recanalization rates to those achieved with cases treated with the 4 × 20 and 4 × 15 in patients with acute stroke.

Materials and methods Materials used were the Solitaire Revascularization device in the sizes 4 × 40 mm, 4 × 20 mm, and 4 × 15 mm. All devices are identical in diameter but differ in the working length.

Methods This is a retrospective study of 247 stroke patients who underwent clot retrieval using a 4 mm diameter Solitaire device as the first device deployed in a case at Saint Luke's Hospital of Kansas City from 2012 till January 2016. Of the 247 total patients, 34 had undergone initial endovascular treatment with the Solitaire 4 × 40 device. The remainder were either treated with the 4 × 20 or the 4 × 15 Solitaire devices. Successful recanalization was determined as having a final TICI score of 2b or higher (>50% recanalization). Almost every case was performed with a balloon guide catheter inflated in the neck vasculature with aspiration on the guide catheter during Solitaire retrieval.

Results The following Table 1 shows the recanalization rate with the different Solitaire devices.

Abstract P-012 Table 1

Size of solitaire Device	Number of patients (n)	Recanalization rate (TICI 2b or higher)
4x15	32	84.38%
4x20	181	88.39%
4x40	34	97.06%

P-Value: 0.1087

Conclusions The Solitaire 4 × 40 device showed a statistical trend for achieving better recanalization compared to the shorter devices. However due to our small sample size of patients undergoing treatment with the 4 × 40, further investigation is warranted to determine whether this result is maintained in larger sample size such as the STRATUS registry.

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P-013 USE OF THE SOLITAIRE DEVICE FOR EMERGENCY REVASCULARIZATION OF THE SUPERIOR MESENTERIC ARTERY

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Background The Solitaire device (Medtronic) was designed for thrombectomy in acute stroke, but its 4–6 mm diameter makes it potentially well suited for peripheral embolectomy cases. In this report, we demonstrate the use of a 6 × 30 mm Solitaire device to revascularize the superior mesenteric artery in a patient with acute mesenteric ischemia.

Methods A 62 year old woman with a history of endometrial cancer and radiation enteritis presented to the emergency department with two days of nausea, vomiting, and increasing abdominal pain. A CT scan of the abdomen with contrast revealed thrombosis of the proximal superior mesenteric artery (SMA) not seen on an abdominal CT performed two months previously (not shown). The patient was placed on a heparin drip and seen emergently by a vascular surgeon who performed a selective SMA angiogram confirming that the main trunk of the SMA was occluded (Figure 1A). Recanalization of the SMA was attempted with both balloon angioplasty and intra-arterial tPA. Salvage treatment using the Solitaire device was then attempted as a joint procedure between vascular surgery and neurosurgery.

A 7 F Cook Shuttle sheath (Cook Medical) was placed into the SMA. A Prowler Select Plus microcatheter (Codman) was then advanced through the clot and into a distal SMA branch over a 0.014" Synchro-2 Soft (Stryker Neurovascular) wire. After performing a microcatheter run to make sure that the distal end of the microcatheter was beyond the clot, a 6 mm x 30 mm Solitaire clot retrieval device (Medtronic) was deployed across the lesion. The Solitaire device was left in place for 5 minutes and then pulled back into the Cook Shuttle sheath. Continuous suction was applied to the sheath during clot retrieval using a 60 cc syringe. A post-thrombectomy angiogram showed full recanalization of the proximal SMA and right main trunk and partial recanalization of the left trunk (Figure 1B).

Results The patient tolerated the procedure well. Her abdominal pain decreased over the next 48 hours and she was able to resume a normal diet. She was started on Coumadin, but later transitioned to aspirin due to difficulties in maintaining a consistent INR.

Conclusions The techniques and equipment used for acute stroke intervention may be suitable for acute recanalization of peripheral vessels, under the right circumstances. As with many surgical interventions, a multidisciplinary approach may at times yield a novel and effective strategy for a difficult clinical problem.

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P-014 A SIX-SIGMA APPROACH FOR DECREASING DOOR TO NEEDLE TIMES IN ENDOVASCULAR STROKE THERAPY

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Background and purpose Delays in delivering endovascular stroke therapy adversely impact outcomes. Time-sensitive treatments such as stroke interventions benefit from methodically developed protocols. Clearly defined roles in these protocols allow for parallel processing of tasks resulting in consistent delivery of care. The paper presents the outcomes of a quality-improvement (QI) process directed at reducing stroke treatment times in a tertiary level academic medical center.

Methods A six-sigma based QI-process was developed over a 3 month period. After an initial analysis, procedures were implemented and fine-tuned to identify and address rate-limiting steps in the endovascular care pathway. Prospectively recorded treatment times were then compared in two groups of patients who were treated "Before" (n = 64) or "After" (n = 30) the QI-process. Three time intervals were measured: ER-arrival to CT-scan (ER-CT), CT-scan to interventional lab (CT-Lab) and Interventional lab arrival to groin puncture (Lab-puncture). The ER-CT time was 40(±29)-minutes in the "Before" and 26(±15)-minutes in the "After" group (p = 0.008). The CT-Lab time was 87(±47)-minutes in the "Before" and 51(±33)-minutes in the "After" group (p = 0.0002). The Lab-puncture time was 24(±11)-minutes in the "Before" and 15(±4)-minutes in the "After" group (p < 0.0001). The overall ER-arrival to groin-puncture time was reduced from 2 hours, 31 minutes (±51 minutes) in the "Before" to 1 hour, 33 minutes (±37 minutes) in the "After" group, (p < 0.0001). The improved times were observed for both during and off-hours interventions.

Conclusion A protocol driven process can significantly improve efficiency of care in the time-sensitive stroke interventions.

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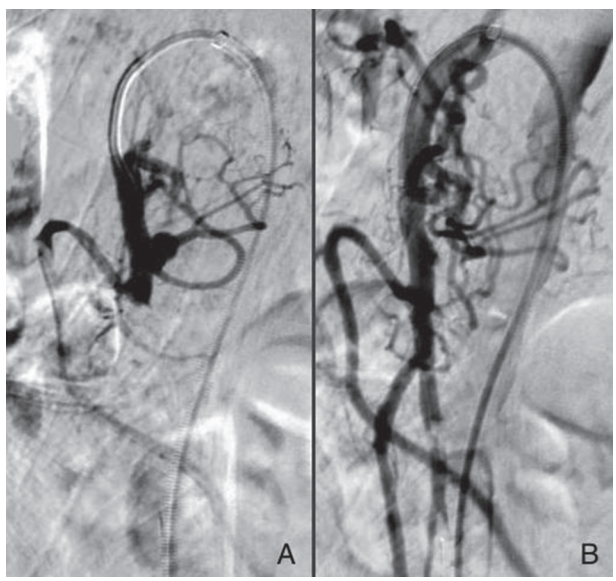

Abstract P-013 Figure 1