O-009 J-WIRING TECHNIQUE AFTER FLOW DIVERTER DEPLOYMENT DAMAGES SURFACE COATINGS ON MICROGUIDEWIRES

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Background To achieve sufficient wall apposition is one of the main technical goals of flow diverter deployment in the treatment of wide-neck cerebral aneurysms. The so-called J-wiring technique is a widely used method to optimize wall apposition.[1] The frictional interaction between the J-loop of the distal guidewire and the flow diverter, both being surface-coated, can be considered a potential source of polymer micro-fragments. The purpose of this in vitro study was to assess the degree of surface damage of guidewires caused by a simple J-wiring maneuver.

Methods A 4.5 × 12 mm Pipeline™ Vantage Embolization Device with Shield Technology™ (Medtronic) was deployed in a silicone model with a 6 mm aneurysm on a curved segment. Four unused samples of three currently available 0.014″ microguidewires, Avigo™ (Medtronic), Synchro[2®] (Stryker), and Traxcess™ (Microvention) were used. The distal ends of 2 guidewires were shaped to a J-loop and then used to simulate the J-wiring technique in the model. One guidewire was shaped into a J-loop, but not used for the J-wiring, another was used as control. All guidewire ends were cut off after and examined by scanning electron microscopy (SEM, Quanta-FEG 3D, FEI).

Results SEM revealed that the coating of each control guidewire was grossly intact and showed only minimal irregularities (**figure 1A**). The shaped Avigo™ and Traxcess wires not used for the J-wiring technique showed some focal and continuous areas of coating damage. No damage to the Synchro[2®] wire was observed after shaping. After shaping and J-wiring, continuous coating damage of the J-loop was found on the Avigo™ and Traxcess wires (**figure 1B**). The Synchro[2®] wires had a slightly irregular coating and some smaller focal areas of abrasion and linear scratches.

Conclusion Damage to polymer coatings of guidewires may be caused by a simple J-wiring technique widely used for optimizing wall apposition after device deployment. This mechanism of surface damage after J-wiring has not been reported yet. It may represent another source of polymer micro-fragments in patients who undergo FD treatment for a cerebral aneurysm and develop non-ischemic cerebral enhancing lesions.[2]

REFERENCES

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2. Shotar E, *et al*. Non-ischemic cerebral enhancing lesions after intracranial aneurysm endovascular repair: a retrospective French national registry. *J Neurointerv Surg*. 2022.

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O-010 THE GUT-BRAIN AXIS: A NATIONWIDE DATABASE ANALYSIS OF GASTROINTESTINAL SYNDROMES PRECEDING A DIAGNOSIS OF INTRACRANIAL ANEURYSMS

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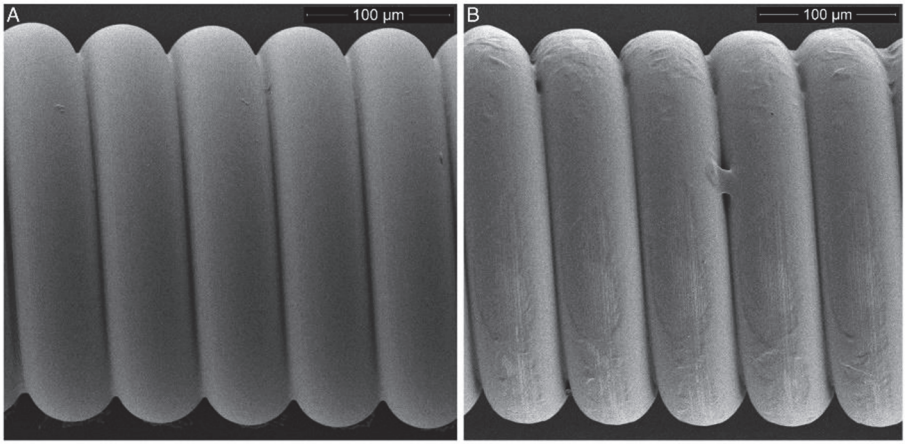
Objective It has been hypothesized that intracranial aneurysm (IA) formation and rupture are affected by the gut microbiome, but research is still limited. This study sought to determine the prevalence of gastrointestinal (GI) syndromes and interventions preceding the diagnosis of IA in comparison to negative controls (NCs).

Methods Utilizing the TriNetX Research Network, a nationwide US-based database (October 1, 2015, to October 1, 2023), we conducted both a case-control and cohort study. In the case-control analysis, patients diagnosed with unruptured IA were compared with propensity-score-matched NCs, as were those with ruptured IA. Additionally, ruptured IA patients were compared with matched unruptured IA cases. To validate findings, a cohort study was conducted, comparing cohorts exposed to various GI syndromes with matched NCs for the development of unruptured and ruptured IAs within a five-year timeframe.

Results Our analysis identified 72,545 unruptured and 46,748 ruptured IA patients for the case-control examination. In comparison to matched NCs, all GI syndromes and appendectomy were significantly associated with both ruptured and



Abstract O-009 Figure 1 Distal end of a traxcess wire. **A.** control wire. **B.** after shaping and J-wire technique

unruptured IAs (all p<0.001). Ruptured IAs demonstrated significant associations with a history of all diseases of the digestive system (ICD-10: K00-K95), dysphagia, diarrhea, and constipation when contrasted with matched unruptured IA cases. Conversely, unruptured IAs exhibited significant associations with a history of gastroesophageal reflux disease (GERD), functional dyspepsia, and irritable bowel syndrome without diarrhea. In the cohort study, dysphagia, diarrhea, constipation, gastroparesis, and fecal incontinence displayed significant associations with both ruptured and unruptured IAs (OR>1; p<0.05). GERD, functional dyspepsia, and irritable bowel syndrome (IBS) without diarrhea were only associated with unruptured IAs.

Conclusion History of dysphagia, diarrhea, and constipation are associated with both the formation and rupture of IAs, while GERD, functional dyspepsia, and IBS without diarrhea are associated with IA formation only. Further studies are warranted to elucidate these associations and explore the intricate interplay among GI syndromes, the gut microbiome, and IA pathogenesis.

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O-011 ENDOVASCULAR FLOW DIVERTER STENTS FOR ACUTE IATROGENIC CEREBROVASCULAR INJURIES

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Introduction and Objective Intraoperative iatrogenic cerebrovascular injury can cause intracranial hemorrhage and pseudoaneurysm formation, putting patients at high risk for postoperative bleeding or vessel rupture. As no established protocol for the treatment of these acute vessel injuries exists, we sought to describe our institution's experience treating patients who suffered iatrogenic neurosurgical cerebrovascular injuries.

Methods Patient electronic medical records were retrospectively reviewed. We reviewed the type of injury, timing of diagnosis, and endovascular management, including antiplatelet regimens, as well as embolization results and clinical outcome.

Results A total of six patients were included in this study. Three patients suffered an injury to the internal carotid artery, one to the left anterior cerebral artery, one to the right posterior cerebral artery, and one to the basilar artery. Four of the six injuries occurred during attempted tumor resection, one during cerebrospinal fluid (CSF) leak repair, and one during attempted microsurgical clipping of an ophthalmic artery aneurysm. Three injuries occurred with transnasal endoscopic approach. All six vessel injuries resulted in pseudoaneurysm formation, one of which included vessel dissection, and five of the injuries were associated with vasospasm. Four of the pseudoaneurysms were immediately detected on postoperative angiography; two were initially negative on angiography and were not detected until postoperative days four and five. Five were treated with a Pipeline Embolization Device (PED) and one with a Silk Vista Baby. Two injuries were treated with two PEDs telescopically overlapped across the pseudoaneurysm. All devices deployed successfully. Patients were maintained postoperatively on a dual antiplatelet therapy of aspirin and clopidogrel or ticagrelor. No parent artery occlusion or stenosis was observed, and complete pseudoaneurysm

Abstract O-011 Table 1 Injury and diagnosis

Case No.	Vessel Injured	Injury Mechanism	Pseudoaneurysm Size at Time of Diagnosis (mm)	Days Post-Op to Injury Diagnosis	Initial Angiogram
1	Left ACA, A2 segment	TSRPT	1.2 × 1.36	0	Vessel injury
2	Right PCA, P2 segment	Clival chordoma resection, pterional approach	0.9 × 1.8	5	Negative
3	Left ICA	CSF leak repair, transnasal endoscopic approach	2 × 2.2 × 0.8	0	Vessel injury
4	Basilar artery	Clival and left cavernous sinus meningioma resection, endoscopic transsphenoidal approach	2.4 × 1.8 × 2.8	4	Negative
5	Right ICA	Subfrontal meningioma resection, bifrontal craniotomy	1 × 0.6	0	Vessel injury
6	Left ICA	Open clipping of an ophthalmic artery aneurysm	1.4 × 1.1	0	Vessel injury

Abbreviations: ACA, anterior cerebral artery; CSF, cerebrospinal fluid; ICA, internal carotid artery; PCA, posterior cerebral artery; SAH, subarachnoid hemorrhage; TSRPT, transsphenoidal approach for resection of pituitary tumor

Abstract O-011 Table 2 Treatment

Case No.	Stent Type, Number, and Size (mm)	No. of Stents Covering Injury	Stent Successful	Follow-Up Imaging	Delayed Complications
1	1 Silk Vista Baby: 2.5 × 10	1	Yes	MRA, no in stent thrombosis at 6 months	None
2	1 PED: 2.5 × 12	1	Yes	CTA, no in stent thrombosis at 1 month	None
3	2 PEDs: 3.5 × 12, 3.75 × 12	2	Yes	MRA, no in stent thrombosis at 16 months	Post-operative epistaxis in hospital
4	1 PED: 3 × 14	1	Yes	MRA, no in stent thrombosis at 13 months	TIA 9 days post-PED, resolved without deficits
5	3 PEDs: 3.25 × 10, 3.5 × 12, 4.75 × 12	2	Yes	Not available	None
6	2 PEDs: 3.75 × 14, 4 × 14	1	Yes	Not available	Not available

Abbreviations: CTA, computed tomography angiography; MRA, magnetic resonance angiography; PED, Pipeline Embolization Device; TIA, transient ischemic attack