0-033  ACTIVE COATING OF FLOW DIVERTERS REDUCE THE NUMBER OF DOWNSTREAM MAGNETIC SUSCEPTIBILITY ARTIFACTS

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Background Endovascular stents and flow diverters carry the risk of thromboembolic complications (TEC), where rates of symptomatic ischemic events range from 4.8–6.8%1, and silent infarcts of up to 82%2. To reduce TEC, flow diverters that use biomimetic coatings to hide from blood products have been introduced. However, another mechanism for TEC relates to vascular trauma from the procedure, which current coated devices fail to address. Herein, we test a novel coating with covalently bound heparin that activates antithrombin and may more comprehensively address TEC by actively downregulating the coagulation cascade. We hypothesized that the coating reduces both acute thrombus (AT) formation on the surface of the device, measured with High-Frequency Optical Coherence Tomography (HF-OCT), and number of magnetic susceptibility artifacts (MSAs) detected on susceptibility-weighted imaging (SWI) MRI.

Methods Twelve canines were implanted with overlapping flow diverters in the basilar artery, separated into two groups: coated (n = 7) and uncoated (n = 5), no anti-platelet therapy was given. For consistency all animals were systemically heparinized during the procedure to an ACT of above 250. Following implant, HF-OCT was acquired to quantify AT formation on the flow diverters (figure 1D). MRI was performed post-op and then repeated at 1,2,3,4, and 8 weeks, consisting of diffusion weighted imaging to assess for infarcts, SWI to locate any MSAs (figure 1B), and FLAIR to assess edema. Neurologic evaluation was done weekly.

Results At implant, the mean AT volume on coated devices was lower than uncoated (0.0124 mm3 vs 0.0145 mm3); however, this was not significant (p = 0.69). Over the course of the follow-up period, the mean number of MSAs was significantly different between the uncoated and coated groups starting at the 1-week follow-up and remaining until the final follow-up (p = 0.27, 0.019, 0.01, 0.012, 0.007, and 0.01 for post-op, 1,2,3,4, and 8 weeks, respectively). The overall trend showed a reduction in the number of MSAs in the coated group, and an increase in the uncoated group (figure 1A). The relationship between volume of AT and number of MSAs (independent of device) showed a linear correlation, where 73% of the variance in the number of MSAs could be explained by the AT (figure 1C).

Conclusions The use of heparin-coated flow diverters in the absence of anti-platelet therapy was able to reduce the number of MSAs over the course of 8 weeks, potentially reducing the incidence of TEC.

REFERENCES
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0-034  BAN THE SCAN: CLINICAL UTILITY OF ROUTINE COMPUTED TOMOGRAPHY OF THE HEAD FOLLOWING ELECTIVE NEUROENDOVASCULAR INTERVENTIONS

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Background Routine imaging after elective neurosurgical procedures is common practice at many institutions. However, recent literature suggests there is little evidence to support this in patients with unchanged postoperative neurologic examination. This has been demonstrated in patients undergoing craniotomy for brain tumors, microsurgical clipping and endovascular coiling of unruptured aneurysms, endoscopic skull base tumor resections, and ventriculoperitoneal shunts. Our objective is to assess the clinical utility of routine computed tomography of the head (CTH) following a broad range of elective neuroendovascular interventions.

Methods A retrospective review was performed on patients who underwent neuroendovascular interventions between 2011–2021 at a single institution. Patients with acute hemorrhage, pre-surgical embolization for resection of tumors or arteriovenous malformations, and patients missing postprocedural CTH were excluded.

Results Of 509 procedures identified, 354 were eligible for analysis. Procedures performed included clipping, stent-assisted coiling, and flow-diverting stents for unruptured cerebral aneurysms; embolization of arteriovenous malformations/fistulas; middle meningeal artery embolization; carotid