the approach to optimize one parameter in a model of the Simmons 2 catheter. Future work is needed to evaluate additional shape parameters.


ROBOTIC TRANSCRANIAL DOPPLER WITH ARTIFICIAL INTELLIGENCE FOR REAL-TIME INTRAOPERATIVE NEUROMONITORING DURING ENDOVASCULAR CAROTID REvascularizational


Introduction Real-time intraoperative neuromonitoring is crucial to account for cerebral blood flow and embolic protection offered by proximal and distal cerebral protection devices during carotid revascularization procedures. We present our initial experience using a novel, artificial intelligence equipped, Transcranial Doppler Robot for real-time intraoperative neuromonitoring.

Methods All patients included in the study were consented and enrolled prospectively between October 2021 thru February 2022. Patients with previously documented high-grade carotid stenosis were included. The TCD Robot head-brace system was used to secure the patients head, and the robot calibrated to automatically identify ipsilateral middle cerebral artery (MCA) or the terminal internal carotid artery (TICA). Patient demographics and procedural characteristics relevant to the robotic system such as signal strength, vessel identified, time to find signal, intracranial depth of the relevant vessel, cerebral waveform, and emboli count were recorded. All procedures were divided into 4 critical phases; i- Access to crossing the lesion, ii- Filter and balloon deployment, iii- Stent placement and implantation, and iv- Removal of delivery system.

Results Eight patients were included in our study (6 males [75%]; mean age 71.5 ±3.9). Six out of 8 patients were symptomatic with a mean percent diameter stenosis of 83.5 ±4.1. Average time taken to find a stable signal was 62 seconds (Range: 10–122). TICA was the vessel identified in all cases with a mean depth of 64 mm (Range: 59–71) (figure 1). Flow arrest was demonstrated in all cases with flow reversal demonstrated in 2 (25%) (figure 1). Mean duration for the TCD robotic surveillance was 23.6 ±0.9 minutes with an average of 117 distal emboli (Range: 45–143) recorded by the device. Linear regression model identified stent placement and implantation as statistically significant (P= 0.0419) contributor to the final emboli count (table 1).

Conclusion To our knowledge, this is the first case series of real-time comprehensive neuromonitoring using a Robotic Transcranial Doppler system with Artificial Intelligence demonstrating various cerebral blood flow parameters including flow arrest and distal embolic incidence intra-operatively.

Disclosures A. Baig: None. A. Monteiro: None. W. Khawar: None. B. Donnelly: None. J. Cappuzzo: None. M. Waqas: None. K. Snyder: 2; C; Boston Scientific, Canon Medical Systems USA, Inc., MicroVention, Medtronic, Stryker Neurovascular. 4; C; Boston Scientific, Access Closure Inc, Niagara Gorge Medical. E. Levy: 2; C; Claret Medical, GLG Consulting, Guidepoint Global, Imperial Care, Medtronic, Rebound, StimMed, Misonix, Mosiac, Clarion, IRRAS. 4; C; NeXtGen Biologics, RAPID Medical, Claret Medical, Cognition Medical, Imperative Care (formerly the Stroke Project), Rebound Therapeutics, StimMed, Three Rivers Medical. A. Siddiqui: 2; C; Amnis Therapeutics, Boston Scientific, Canon Medical Systems USA Inc., Cerebrotech Medical Systems Inc., Cerenovus, Corindus Inc., Endostream Medical Ltd., Imperative Care, Inc. Integra LifeSciences C. 4; C; Adona Medical, Inc, Amnis

Abstract O-032 Figure 1  Robotic TCD Interface showing MCA Signal with Emboli seen on the right side

Abstract O-032 Table 1 Procedural events and linear regression showing emboli count

<table>
<thead>
<tr>
<th>Procedural Event</th>
<th>Mean Embolic during CAS (SD)</th>
<th>Linear Regression Model (P-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to Crossing the Lesion</td>
<td>16.6 (SD ± 5.46)</td>
<td>0.5745</td>
</tr>
<tr>
<td>Filter and Balloon Deployment</td>
<td>32.2 (SD ± 34.77)</td>
<td>0.7679</td>
</tr>
<tr>
<td>Stent Placement and Implantation</td>
<td>180.4 (SD ± 48.27)</td>
<td>0.0419</td>
</tr>
<tr>
<td>Removal of Delivery System</td>
<td>16.4 (SD ± 26.31)</td>
<td>0.1344</td>
</tr>
<tr>
<td>Mean Total Count</td>
<td>245.6 (SD ± 71.33)</td>
<td>-</td>
</tr>
</tbody>
</table>

Abstracts
Therapeutics, (Purchased by Boston Scientific October 2017), Blink TBI Inc., Buffalo Technology Partners Inc., Cerebrotech Medical Systems, Inc., Cognition Medical, Endostrea.

**Abstract O-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 on 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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**Abstract O-034**

**BAN THE SCAN: CLINICAL UTILITY OF ROUTINE COMPUTED TOMOGRAPHY OF THE HEAD FOLLOWING ELECTIVE NEUROENDOVASCULAR INTERVENTIONS**

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**Introduction/Purpose** 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 examinations. 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.

**Materials and 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