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0-019 SAFETY AND EFFICACY OF CANGRELOR USE IN NEUROVASCULAR INTERVENTION: A MULTICENTER EXPERIENCE

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Introduction/Purpose In patients undergoing acute neurointervention, thromboembolic complications are the most common procedure related morbidity, in special when endoluminal prosthesis (stents/flow diverters) are needed. Dual-antiplatelet therapy (DAPT) has been used in order to prevent these events. Cangrelor is a potent, intravenous, P2Y₁₂-receptor antagonist presented as an alternative to oral antiplatelet agents, with a rapid onset and offset. We aimed to evaluate the safety and effectiveness of cangrelor in patients with acute neurologic ischemic disease and intracranial aneurysms that underwent endovascular intervention.

Materials and Methods We conducted a multicenter retrospective review of patients who underwent acute neurological intervention and had cangrelor as part of their optimal treatment. Patients from four comprehensive interventional neurovascular centers were included and allocated into two groups: (1) Acute ischemic (acute stroke and/or symptomatic atherosclerotic disease) and Aneurysms (ruptured and unruptured). Clinical presentation, laboratorial data, and outcomes were analyzed with an emphasis on periprocedural thromboembolic and hemorrhagic complications.

Results A total of 66 patients were included, 42 of whom were allocated in the ischemic group and 24 in the aneurysm group. In the acute ischemic group, median NIHSS was 15.5 (IQR, 8.25–21], and the majority of patients underwent mechanical thrombectomy (73%) associated with either rescue intracranial stenting (61.3%) or carotid stenting (35.4%). The overall periprocedural complication in this group was 9.5%, corresponding to 3 (7.1%) postoperative symptomatic intracranial hemorrhages (sICH) and 1 (2.3%) intraoperative thromboembolic event. At discharge, a favorable outcome (mRS 0–2) was noted in 47.6%, and 1 (2.4%) patient died after the progression of a sizeable infarct. In the aneurysm group, 66.7% were ruptured, and the most common treatment modality was flow diverter (66.7%). Although overall periprocedural complication was noted in 3 cases (12.5%), only one complication (4.2%) had occurred during or after cangrelor infusion. It consisted of a sICH in previously ruptured aneurysm. The other two complications occurred before cangrelor infusion, being 1 sICH and 1 thromboembolic event. At discharge, a favorable outcome (mRS 0–2) was seen in 66.7%, and mortality was 8.3%, related to the ruptured aneurysms that progressed with sICH. When both groups were divided according to cangrelor infusion duration, there was no significant difference in the number of complications in patients

receiving either short (median of 2h hours) or prolonged (median of 24 hours) infusion.

Conclusion Cangrelor is a safe alternative in patients requiring immediate intervention with the use of stents and flow diverters. Cangrelor was not associated with increased rates of hemorrhagic complications and also allowed the possibility for a secure transition to long-term DAPT and progression to surgery in the setting of unexpected complications. Ideally, prospective studies with larger samples and comparison with a standard antiplatelet regimen are required to clarify the best protocol, safety profile, and effectiveness of cangrelor in neurologic endovascular interventions, unlikely to happen on our field.

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0-020 ENDOLUMINAL BIOPSY FOR MOLECULAR CLASSIFICATION OF HUMAN BRAIN ARTERIOVENOUS MALFORMATIONS

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Introduction Brain arteriovenous malformations (bAVMs) are dysplastic tangles of blood vessels with direct arterial-venous shunting. Evidence has suggested that bAVMs may arise from different somatic or germ-line mutations. However, there are no methodologies to molecularly characterize bAVMs without open surgery. Whether different molecular subgroups may explain divergent natural histories remains unknown. We describe a novel endovascular biopsy (EB) technique to permit comprehensive genome-wide transcriptomic classification of bAVMs without need for open surgery in living patients.

Methods EB and computational fluid dynamic modeling (CFD) was performed during preoperative embolization. Cells were obtained from a bAVM juxta-nidal feeding artery and systemic iliac artery (control) with a platinum detachable coil and 0.035-inch wire, respectively. Endothelial cells (ECs) were isolated with fluorescence assisted cell sorting (FACS) and sequenced on an Illumina HiSeq 4000 sequencer. Differential gene expression and gene ontology analyses were performed.

Results EB was successful in 4 patients without complication. FACS sorting detected viable ECs (CD31-positive, DAPI-negative) in each patient. EB yielded 269.0 ± 79.9 cells per biopsy (control: 309.2 ± 86.6 cells; bAVM: 228.8 ± 133.4). Differential gene expression analysis demonstrated 106 differentially expressed genes in bAVM ECs (FDR < 0.05) (figure 1A), and clear separation of bAVMs and patient-matched controls on principal component and heatmap analyses (figure 1B). Differentially expressed genes were enriched for bAVM-related Ras-MAPK signaling and angiogenic cell motility pathways ($p < 0.05$) (figure 1C). When compared to open surgery, EB detected 83.3% of genes and genome-wide expression strongly correlated with ECs from open surgery ($R^2 = 0.8$). CFD modeling of blood