Background Osteogenesis Imperfecta (OI) is a heritable collagen synthesis disorder which predisposes individuals to numerous maladies including easy bone fracture, vessel fragility, and platelet dysfunction. We report the first known case of neuro-interventional treatment with flow diversion embolization of intracranial aneurysms in a patient with OI.

Methods We identified a patient in our IRB-approved prospective cerebrovascular database with OI and reviewed pertinent demographic information, medical history, aneurysm type, procedural details, periprocedural events and angiographic follow-up.

Results A 60-year-old woman with known OI type IV, history of 46 lifetime bone fractures and hypertension, underwent workup for transient ischemic attacks revealing a 4-mm anterior cerebral artery (ACA) aneurysm along the right A1 segment in 2016. Perioperative dual antiplatelet therapy was aspirin 81 mg and clopidogrel 75 mg daily. A tri-axial catheter access system consisting of a guide catheter (Infinity), distal access catheter (Catalyst 5), and a microcatheter (Via27) over a guidewire was utilized to deploy a 3.5 x 16 mm Pipeline Flex Embolization Device, jailing the right middle cerebral artery (MCA). There were no perioperative complications. Two-month clinical and angiographic follow-up revealed Raymond I obliteration of the aneurysm with robust ACA pial collateralization (Level 1) and stable right MCA collateralization. Flow diversion embolization of the de novo aneurysm consisted of a triaxial system with a guide catheter (Infinity), distal access catheter (Catalyst 5), and a microcatheter (Via27) over a guidewire was utilized to deploy a 3.5 x 16 mm Pipeline Flex Embolization Device, jailing the right middle cerebral artery (MCA). There were no perioperative complications. Two-month clinical and angiographic follow-up revealed Raymond I obliteration of the aneurysm with robust ACA pial collateralization (Level 1) and stable right MCA collateralization. Flow diversion embolization of the de novo aneurysm consisted of a triaxial system with a guide catheter (Infinity), distal access catheter (Catalyst 5), and a microcatheter (Via27) over a guidewire was utilized to deploy a 3.5 x 16 mm Pipeline Flex Embolization Device, jailing the right middle cerebral artery (MCA). There were no perioperative complications. Two-month clinical and angiographic follow-up revealed Raymond I obliteration of the aneurysm with robust ACA pial collateralization (Level 1) and stable right MCA collateralization.

Conclusion Endovascular flow diversion as a treatment modality can offer safe and curative reconstruction of intracranial aneurysms in patients with osteogenesis imperfecta.


E-244 COST-EFFECTIVENESS OF PREOPERATIVE EMBOLIZATION IN ARTERIOVENOUS MALFORMATIONS


Introduction Preoperative embolization of arteriovenous malformations (AVMs) remains controversial. Herein, the cost-effectiveness (CE) of preoperative embolization of AVMs is analyzed.

Methods Patients with an AVM resection at a single quaternary institute from 2015–2020 were analyzed. Patients with preoperative embolization were compared to those without embolization prior to resection. CE was the primary outcome of interest and was determined by dividing the total 1-year cost (hospital, discharge facility, and follow-up) by effectiveness that was derived from a validated pre-operative to last follow-up change in modified Rankin Scale (mRS) utility score (CE=Cost/(1 + [(Utility_post - Utility_pre)/Utility_pre])). Thus, in this metric, a lower CE score signifies a more cost-effective treatment strategy. Significance was defined as p<0.05.

Results Of the 265 patients included in the study, 102 (38%) underwent preoperative embolization and 163 (62%) had no preoperative embolization. The total cost was higher in the preoperative embolization ($123,815, SD 106,523) compared to the non-preoperative embolization AVM cohort ($81,632, SD 67,274) (p<0.001). The CE was lower in the preoperative compared to non-preoperative embolization cohorts ($200,055, SD 379,372 vs $333,664, SD 1,639,078; p<0.001). In low grade AVMs (SM-1 and 2), the CE was higher in the preoperative embolization (N=38, $164,329, SD 347,627) versus the non-preoperative embolization patients (N=78, $76,483, SD 64,760) (p<0.001). In intermediate grade AVMs (SM-3), preoperative embolization (N=34, $154,762, SD 219,331) was found to have a lower CE compared to the non-embolization cohort ($186,251, SD 452,796) (p=0.01). There was no statistically significant difference in CE in higher grade AVMs (SM-4 and 5) between both cohorts (preoperative embolization: N=12, $503,639, SD 776,492; non-preoperative embolization: N=6, $2,048,419, SD 4,794,758; p=0.49).

Conclusion In this study, pre-operative embolization of Spetzler-Martin Grade 3 AVMs was cost-effective whereas it was not found to be cost-effective in lower grade AVMs.