(12/47), 20% of torcular (3/15), and 8% of cavernous sinus (5/60) dAVFs. Of 68 dAVFs with APA supply, embolization was carried out via this pedicle in eight (12%), and seven were ultimately occluded.There were no complications, including no post-treatment cranial neuropathies or radiographic evidence of nontarget embolization. For five dAVFs, the APA was selected as the initial pedicle for embolization (marginal sinus, n = 2; distal sigmoid, n = 1; cavernous, n = 1, tentorial, n = 1). In 4/5 cases, dAVF occlusion was achieved via the initial APA feeding artery pedicle. In one case, near complete, stagnant occlusion was achieved; adjunctive embolization of a single additional MMA pedicle was performed. In three other cases of complex transverse/sigmoid dAVF, the APA was utilized after multiple attempts via middle meningeal and occipital artery pedicles. Occlusion was not achieved transarterially; two of the three dAVFs were ultimately occluded transvenously.

Conclusion In rare, select cases, the APA is an excellent route for transarterial embolization of cranial dAVFs.

Disclosures B. Gross: None. **F. Albuquerque:** None. **K. Moon:** None. **C. McDougall:** None.

P-023 CEREBRAL ARTERIOVENOUS MALFORMATION FLOW IS ASSOCIATED WITH VENOUS INTIMAL HYPERPLASIA

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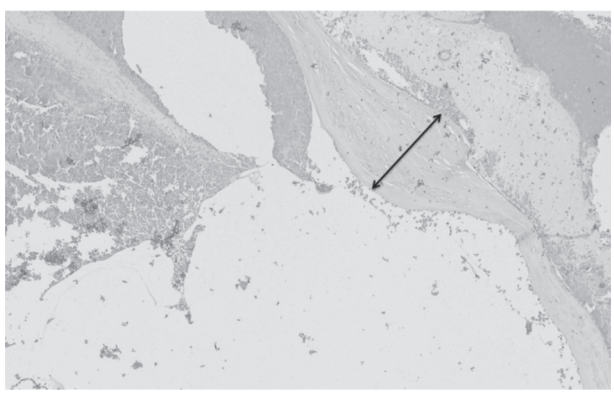
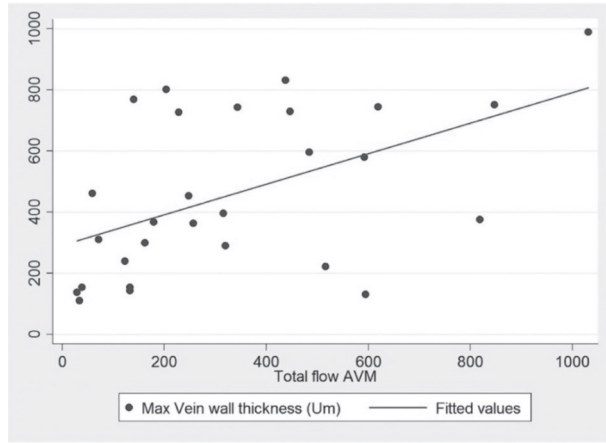
Introduction/purpose Histopathological changes in cerebral arteriovenous malformation (AVM) draining veins secondary to chronically high AVM inflow have not been clearly elucidated. Here, we examine the relationship between draining vein wall thickness and AVM flow rate.

Materials and methods Records of patients with cerebral AVMs evaluated at our institution between 2007–2013 were retrospectively reviewed. Patients were included if a surgical specimen of the nidus was available and if flows were obtained before treatment using quantitative magnetic resonance angiography. Specimens were mounted on slides and stained with hematoxylin and eosin as well as elastin special stain. Perinidal veins were identified and the wall thickness of each vein was measured from digitized images of the slides (Figure 1). Maximum vein wall thickness was recorded for each specimen.



Abstract P-023 Figure 1 Example of a perinidal vein with thickened wall. Elastin special stain; original magnification x 10



Abstract P-023 Figure 2 Maximum vein wall thickness (μm) versus total AVM flow (mL/minute) (rho = +0.51, P = 0.006)

Intranidal arteries were also identified and the diameter of each artery was measured. Total AVM flow was estimated as aggregate flow within primary arterial feeders or flow in single draining veins. The relationship between maximum vein wall thickness, total AVM flow, flow per draining vein, flow per unit volume of AVM, and mean intranidal artery diameter was assessed.

Results 28 patients (20 male, 8 female) with mean age of 37 years (range 16–68 years) were included. Spearman's correlation revealed a statistically significant relationship between maximum vein wall thickness and total AVM flow (rho = +0.51, P = 0.006) (Figure 2) as well as AVM flow per draining vein (rho = +0.41, P = 0.03). However, there was no statistically significant correlation between maximum vein wall thickness and flow per unit volume of AVM (rho = +0.27, P = 0.17) or mean intranidal artery diameter (rho = +0.42, P = 0.24). Mean vein wall thickness was significantly higher in the presence of venous ectasia (562 μm vs. 300 μm, P = 0.007). Presence of venous stenosis was not significantly associated with age, Spetzler-Martin grade, volume, number of draining veins, deep venous drainage, intranidal fistula, or maximum vein wall thickness.

Conclusion Maximum vein wall thickness is significantly related to total AVM flow and AVM flow per draining vein. This finding implicates chronically high AVM inflow in venous intimal hyperplasia and possible subsequent development of venous outflow stenosis.

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P-024 PROMINENT CONDYLAR VEINS CAUSING PULSATILE TINNITUS: DYNAMIC ANGIOGRAPHIC CONFIRMATION

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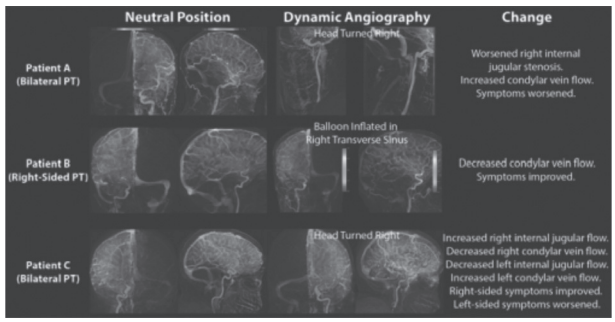
Introduction/purpose Numerous processes can cause pulsatile tinnitus (PT), some of which are potentially life threatening. This case series describes a cause of PT – prominent condylar veins – that has undergone little investigation to date. This report characterizes angiographic findings in patients with



Abstract P024 Figure 1

prominent condylar veins and means to localize symptoms to these structures using dynamic angiography with head positioning and venous balloon test occlusion.

Materials and methods Retrospective analysis was performed under IRB approved protocol for 43 consecutive PT patients referred for diagnostic angiography at a major academic medical center between January 2013 and December 2015. Rates of different etiologies of PT among patients in this group were noted. In addition to standard diagnostic cervicocerebral angiography, dynamic angiography with head turning was conducted. The effects of provocative maneuvers were measured using time-resolved flow analysis known (iFlow, Siemens Healthcare, Erlangen Germany).

Results 5 (11.6%) patients were found to have prominent condylar veins. 16 (37.2%) had a dAVF, 4 (9.3%) had a venous diverticulum, and 9 (20.9%) had no angiographic abnormality detected. The findings of the five patients with prominent condylar veins are summarized in the table. Representative images are provided in the figure.

Conclusion Prominent flow in condylar veins should be considered among the numerous causes of PT. This may be a frequent cause of these symptoms in patients who previously would have had no identifiable cause Further investigation is warranted with respect to this cause of PT and PT in general.

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P-025 CALCIUM CHANNEL BLOCKER INFUSION IMPROVES VESSEL MEASUREMENT ACCURACY AND ANEURYSM OCCLUSION FOLLOWING FLOW DIVERSION

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Introduction/purpose To best achieve complete occlusion of aneurysms treated with flow diverters (FDs), devices must be accurately sized to precisely match the parent vessel diameter. Appropriately sized FDs will have maximal coverage over the aneurysm neck and will be more likely to induce thrombosis. Catheterization for diagnostic angiography can cause vasospasm that may affect vessel measurements. This study evaluates the effects of intra-arterial infusion of a calcium channel blocker (CCB) on angiographic measurements in patients treated with FDs, investigating the impact on the final diameter of the expanded stent following deployment and subsequent occlusion.

Materials and methods Retrospective analysis was performed of prospectively maintained procedure records to identify patients with aneurysms treated with FDs. In all patients, pre-treatment measurements were recorded for vessel diameter of the distal and proximal landing zones, as well as maximum and minimum diameters between these segments. Post-treatment measurements of the stent itself following deployment were recorded at the distal and proximal ends in addition to maximum and minimum diameters. When CCB was infused prior to treatment, post-infusion pre-treatment measurements were recorded. All measurements were performed after calibrating to a catheter included on the image. Rates of occlusion and time to confirmed occlusion were noted for all patients. Independent-sample 2 tailed T-tests were performed to assess for differences in pre- and post-treatment measurements, rates of occlusion, and time to confirmed occlusion between groups with and without CCB infusion.

Results 21 FDs were deployed to treat 19 aneurysms in 18 patients. CCB infusion was performed prior to deployment of 9 devices. The change in measurements noted after CCB infusion are summarized in Table 1. No significant difference was noted between groups for pre- and post-treatment measurement changes. Subsequent aneurysm occlusion was more likely

Abstract P024 Table 2

				Physical Examination Findings		Dynamic Angiogram Findings		
Patient	Age (Years)	Gender	PT Laterality	Manual Compression	Head Turning	Neutral Position	Head Turned Right	Head Turned Left
1	55	Male	Bilateral	Improves on Right	Worsens to Right, Improves to Left	Prominent Bilateral Condylar Veins	Increased Condylar Flow	Decreased Condylar Flow
2	39	Female	Right	Improves on Right	Worsens to Right, Improves to Left	Prominent Right Condylar Veins	Increased Condylar Flow	Decreased Condylar Flow
3	65	Male	Bilateral	Ipsilateral Improvement Bilaterally	Worsens Ipsilaterally, Improves Contralaterally	Prominent Bilateral Condylar Veins	Decreased Condylar Flow on Right, Increased on Left	Increased Condylar Flow on Right, Decreased on Left
4	43	Female	Left	No Change	No Change	Prominent Bilateral Condylar Veins	Not Performed	Not Performed
5	44	Female	Left	No Change	Not Queried	Prominent Left Condylar Veins	Not Performed	Not Performed