Intracranial Venous Drainage of a Cirsoid Aneurysm in a Child: Case Report and Literature Review.

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Introduction

Cirsoid aneurysms, also known as scalp arteriovenous malformations (AVM), are rare, congenital extracranial vascular anomalies that often present as a pulsatile, enlarging scalp mass. The arterial supply to these lesions is commonly via the superficial temporal artery (STA) or occipital artery, and venous outflow is routinely via extracranial tributaries to external jugular veins. We present a case of a previously unreported cirsoid aneurysm vascular configuration.
Methods

A fourteen-year-old male presented to Lurie Children’s Hospital of Chicago (LCH) with a pulsatile scalp lesion that had first been noticed three years prior and had progressively enlarged. No trauma history was reported. MRI and catheter angiography demonstrated 4cm wide and 2cm tall cirrloid aneurysm nidus. The patient underwent transvenous endovascular embolization followed by surgical excision via a bicoronal incision. We compare the anatomy in this case to a typical cirrloid aneurysm seen at LCH recently.
Results

Distal extracranial branches of the bilateral ophthalmic arteries contribute to the lesion anteriorly, in addition to bilateral STA, which has previously been described in the literature as an uncommon configuration. In addition to the typical extracranial venous drainage, transosseous emissary veins were noted draining intracranially into the superior sagittal sinus. To our knowledge, this is the first description of transosseous intracranial venous drainage of an cirsoild aneurysm without additional intracranial vascular malformations. During surgery, care was taken to identify and transect feeding arteries, completely resect the galeal nidus, and wax transosseous venous channels.
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Digital subtraction angiography right ECA injection lateral (A, C) and AP (E,G) views in late arterial phase and venous phase, respectively, and left ECA injection lateral (B) and AP (F) views in late arterial phase. Right (D) and left (H) ICA injection lateral views.
Results

MRI brain T1 sagittal without contrast (I) and T1 axial with contrast (J). Native AP (K) and lateral (L) xray images following lesion embolization. Evidence of transosseous drainage into the superior sagittal sinus (G).
Scalp AVMs are rare lesions that are typically secondary to anomalous connections between superficial STA or occipital arteries and venous outflow into extracranial veins. To our knowledge, we report on a scalp AVM with venous outflow that had a transosseous component into the superior sagittal sinus. As with entirely extracranial lesions, scalp AVMs with limited transosseous venous outflow into intracranial sinuses may be successfully managed with pre-operative embolization and surgical excision. Pre-operative vascular imaging is crucial in demonstrating AVM morphology and guiding management decisions.
Summary

The interesting vascular architecture of this cirsoid aneurysm with transosseous intracranial venous drainage highlights the value of diagnostic angiography prior to pursuing further intervention as to fully characterize these rare and complex vascular lesions.