Angiographic analysis as an intraoperative predictor in adult patients with juvenile angiofibroma: A descriptive study

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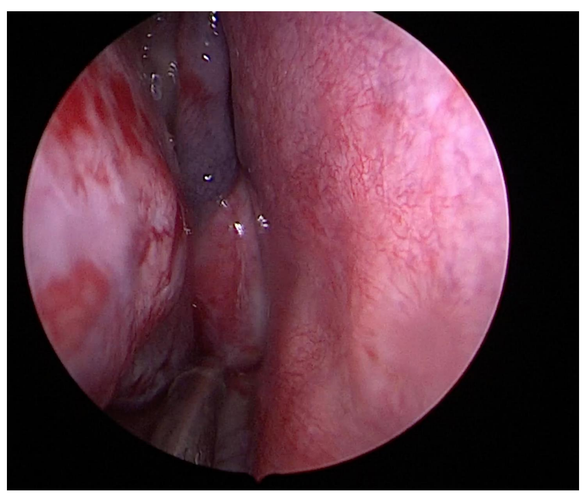
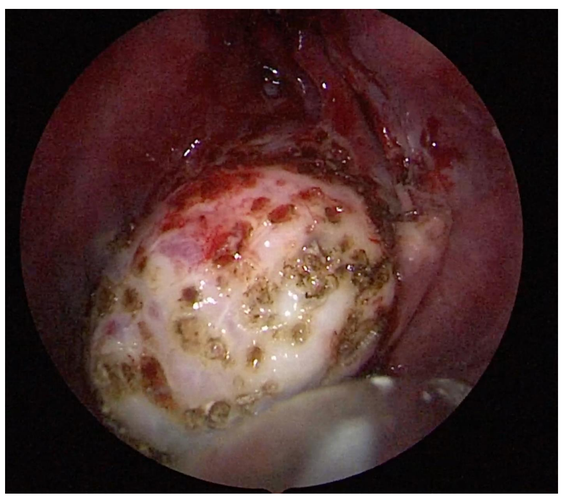
INTRODUCTION

Juvenile angiofibroma is a rare, benign, highly vascular nasopharyngeal tumor that predominantly affects adolescent males. Its complex anatomy and vascularity make surgical treatment challenging, emphasizing the role of imaging and angiography in diagnosis and preoperative planning.

Originating near the sphenopalatine foramen, the tumor may extend to the nasal cavity, skull base, orbit, infratemporal fossa, or intracranial space, contributing to clinical variability and operative complexity.

Preoperative angiography identifies feeding vessels, guides embolization, and reduces bleeding, transfusion needs, and recurrence. Angiographic patterns may also predict surgical difficulty and complications; however, correlations with intraoperative outcomes—especially in adults—remain limited, motivating this study.





MATERIAL AND METHODS

A retrospective descriptive study was conducted at the “Instituto de Neurocirugía Dr. Alfonso Asenjo” (2017–2024), including patients surgically treated for juvenile nasopharyngeal angiofibroma between 11 to 28 years old.

Diagnosis was established clinically and confirmed with CT and/or MRI plus diagnostic angiography. Demographic, clinical, imaging, surgical, and follow-up variables, including bleeding, operative time, complications, transfusion, and recurrence, were recorded. Tumors were staged using the Radkowski classification.

All patients underwent selective internal and external carotid angiography to identify feeding vessels, anastomoses, and embolization strategy. Preoperative embolization was performed within 24 hours before surgery.

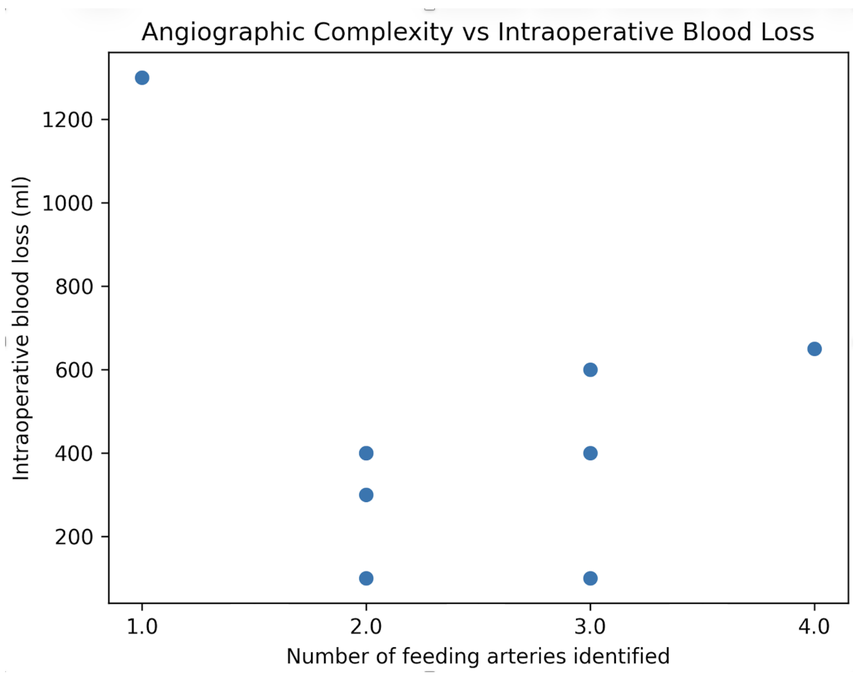
Tumors were resected endoscopically under general anesthesia, documenting intraoperative findings and outcomes. Data were analyzed using descriptive statistics, Spearman correlation for continuous variables, and t-test or Mann–Whitney U for group comparisons, with significance set at $p < 0.05$

Parameter	Value
Age, median (range)	14 (10–28)
Symptom duration, months (range)	20 (13–36)
Preoperative CT/MRI	100%
Preoperative angiography	100%
Epistaxis laterality	Left (67%)

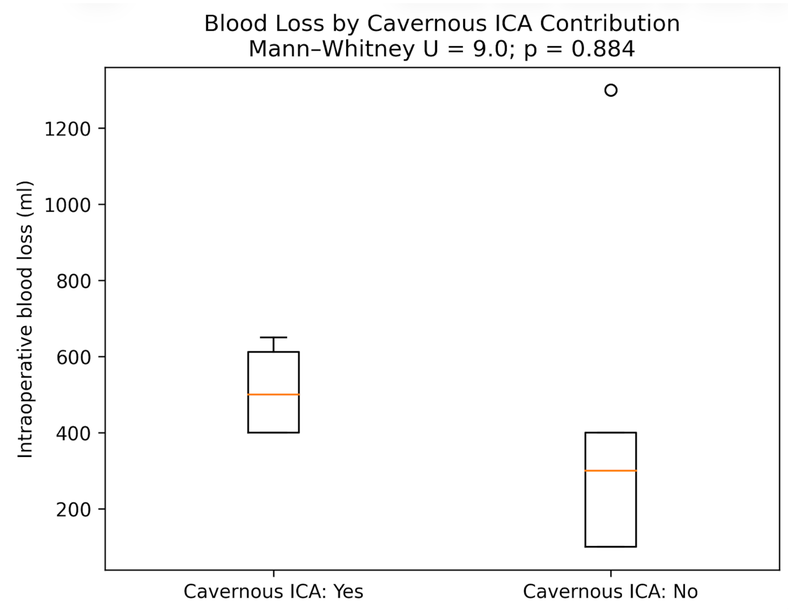
RESULTS

A total of nine patients were included in the study, all of whom were male, with ages ranging from 10 to 28 years. Most tumors presented advanced local extension (Radkowski III in 6/8 patients), frequently involving the skull base and adjacent fossae. Juvenile angiofibroma showed consistent internal maxillary dominance with variable ICA and accessory arterial supply, highlighting the relevance of selective angiography for surgical planning

Endoscopic resection showed acceptable operative time, moderate bleeding, no major complications, and 22% recurrence, with moderate correlation between operative time and blood loss ($\rho = 0,46$; $p = 0,24$).



Patients with higher arterial counts (3–4 vessels) showed greater blood loss (≈600–650 ml), whereas those with two arteries ranged between 100 and 400 ml, suggesting that increasing vascular complexity may contribute to intraoperative bleeding



Descriptively, patients with a cavernous internal carotid artery (ICA) contribution showed higher mean and median bleeding volumes; however, these differences did not reach statistical significance.

CONCLUSION

In this adult cohort of juvenile angiofibroma, angiography confirmed dominant internal maxillary supply with frequent additional vascular contributions. While statistical associations with intraoperative bleeding were limited by sample size, angiographic complexity demonstrated clinically relevant trends, reinforcing the role of selective angiography and embolization in surgical planning.

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