

Two-surgeon, multi-portal endoscopic transnasal and transmaxillary approach for resection of juvenile nasopharyngeal angiofibroma: A case series

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Background

Juvenile nasopharyngeal angiofibroma (JNA) is a rare, benign hypervascular tumor, typically occurring in adolescent males. Despite the benign nature, these lesions have propensity for rapid expansion, erosion of the skull base and sinonasal bony structures, and significant epistaxis. Surgical resection via a single-surgeon approach is made challenging due to limited sinus aeration in children and tumor-associated hemorrhage, limiting visualization and bimanual dissection technique.

Objective

To describe surgical decision making and intraoperative technique for a two surgeon, multiportal endoscopic approach for resection of JNA.

Methods

An IRB-approved retrospective single institution cohort study of pediatric patients undergoing a multiportal endoscopic endonasal and Caldwell-Luc approach for resection of high UPMC JNA grade tumors between 2022 and 2025 was performed. Demographic, radiographic, and perioperative data was obtained using the electronic medical record. Descriptive statistics were used for data reporting.

Results

A total of four patients were included for study, all of which were boys with a median age of 14.5 years. Two patients had undergone prior subtotal resection at another institution and experienced lesional progression and symptomatic epistaxis. Two cases were UPMC JNA grade 4 and 2 cases were UPMC JNA grade 5L. All patients underwent preoperative embolization of the internal maxillary artery. A combined endoscopic endonasal and Caldwell-Luc approach was used allowing for a two-surgeon approach through multiple operative corridors to improve visual vectors and instrument triangulation. Gross total resection was achieved in all cases. One patient required an intraoperative transfusion. Surgical video is available for presentation.

Conclusions

A dual surgeon, multi-portal approach for pediatric JNA via endoscopic endonasal and Caldwell-Luc approaches affords the benefit of bimanual dissection technique with excellent endoscope and instrument triangulation allowing for visualization and dissection of all tumor borders. For high grade lesions involving multiple sinonasal and skull base compartments, this strategy should be considered by multidisciplinary skull base teams to optimize extent of resection and limit operative time and blood loss.

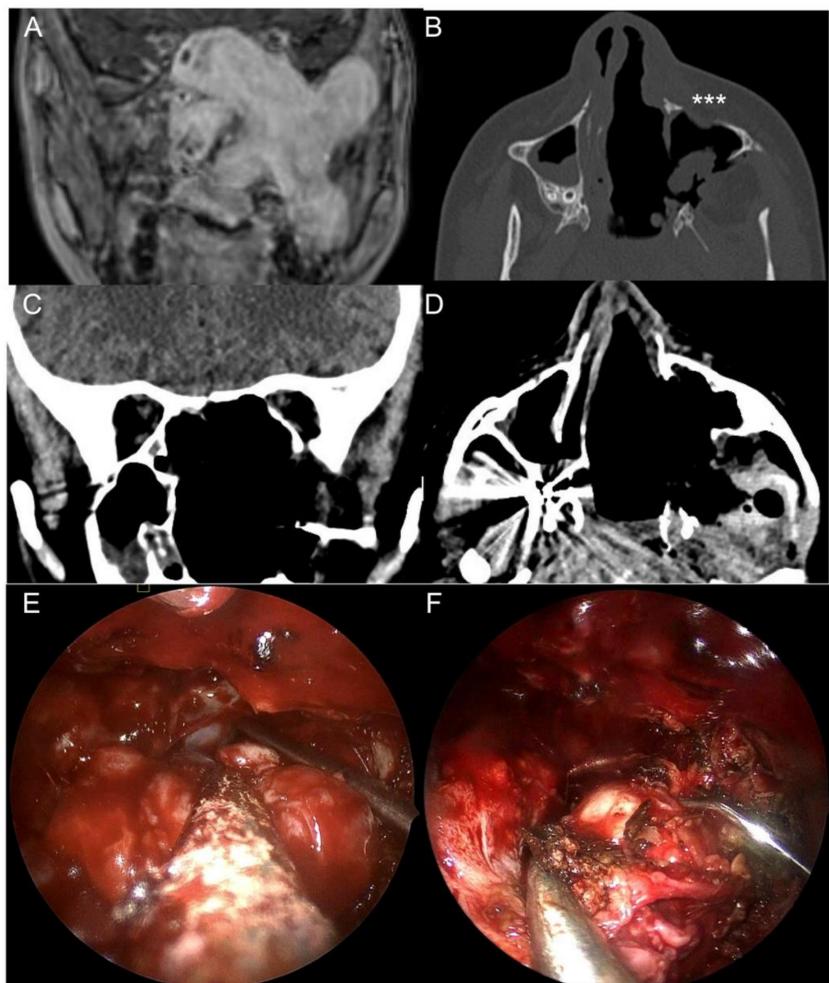


Figure 1: (A) Representative preoperative imaging of a JNA (UPMC JNA grade 5L) in a 16-year-old boy. (B) Postoperative CT showing Caldwell-Luc exposure for transmaxillary access with the osteotomy delineated by ***. (C and D) Representative postoperative CT showing complete resection of JNA. (E) Intraoperative endoscopic image showing benefit of instrument and endoscope triangulation and bimanual technique through multiple corridors. (F) Intraoperative endoscopic image showing delivery of the lateral most component of the tumor.

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References

1. Valencia-Sanchez BA, Plata HF, Brandel MG, et al. Complex Single-Stage Juvenile Nasopharyngeal Angiofibroma Resection: A Hybrid Pediatric Endoscopic Endonasal and Transmaxillary Approach. *Oper Neurosurg*. Published online June 16, 2025. doi:10.1227/ons.0000000000001662
2. Bove I, Pangal DJ, Ruzevick JJ, et al. Anatomic Considerations Guiding Single Versus Multiportal Endoscopic Approaches for Resection of Juvenile Nasopharyngeal Angiofibroma: Cases Series With Graded Multicorridor Resections. *Oper Neurosurg*. 2023;25(2):150-160. doi:10.1227/ons.0000000000000709
3. Marshall C, Agosti E, Peris-Celda M, Pinheiro-Neto CD. Combined endoscopic endonasal and sublabial transmaxillary approaches for resection of intracranially extended juvenile nasopharyngeal angiofibroma. *Acta Neurochir (Wien)*. 2023;165(7):1773-1780. doi:10.1007/s00701-023-05634-2