Coblation Assisted Endoscopic Excision of a Juvenile Nasopharyngeal Angiofibroma via a Combined Transoral/Transnasal Approach
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ABSTRACT
Juvenile nasopharyngeal angiofibroma (JNA) is a relatively rare, histologically benign, yet locally aggressive, vascular tumor that typically affects adolescent males. We present a case of a 12-year-old male with a left-sided Radkowski Stage IIIA JNA who underwent preoperative embolization followed by Coblation-assisted endoscopic resection via a combined transoral and transnasal approach. Our case demonstrates a novel combined approach and suggests that Coblation may be used in JNA resection in a relatively safe, efficient, and effective manner.

INTRODUCTION
Juvenile nasopharyngeal angiofibroma is a rare vascular tumor comprising 0.05% to 0.5% of all head and neck tumors, 1 typically occurring in the adolescent male. They are progressively invasive, slow growing tumors that typically originate from the posterior nasal septum and sphenopalatine foramen. Histologically, they are benign tumors comprised of vascular endothelium embedded in a fibrous stroma and have been proposed to result from the incomplete involution of branchial arch vascular remnants.2 JNAs will typically present with recurrent epistaxis and painless unilateral nasal obstruction. Endoscopic tube duction, recurrent sinusitis, facial pain/numbness, or visual disturbances are less common manifestations.

CASE PRESENTATION
A 12-year-old male was referred to our pediatric otolaryngology clinic with a 3-month history of left sided nasal obstruction and weekly epistaxis. In-office endoscopy revealed a smooth, erythematous mass in the left nasal cavity extending to the nasopharynx concerning for a JNA. A CT scan with contrast demonstrated a 3.9 x 3.8 x 4.8 cm hypervascular mass within the left nasal cavity and nasopharynx. It extended into the sphenoid and ethmoid sinuses, widening the pterygopalatine fossa, and eroded the left pterygoid plate and skull base (Figure 1). The physical exam and radiologic findings were consistent with a Radkowski Stage IIIA JNA.

SURGICAL TECHNIQUE
Preoperative angiography demonstrated the left internal maxillary artery to be the only feeding vessel, with the neovascular blush measuring approximately 4.5 x 3.0 cm (Figure 2). Twenty-four hour preoperative embolization was done with polyvinyl alcohol microspheres and c Hotels. Intraoperatively, 4% cocaine soaked pledgets were placed intranasally for ten minutes for vasocostriction, and the left great palatine foramen was injected with 1 mL of 1% lidocaine with epinephrine. BrainLab Image Guidance (BrainLab, Munich, Germany) was calibrated. A Crowe-Davis mouth gag was inserted, and the nasopharynx was visualized using a 30° endoscope inserted transanally. We used the Coblator Evac70 Xtra Plasma Wand on settings of 9 & 5 (coblation/coagulate). The wand was used to identify and free the posterior and inferior attachments of the JNA to the level of the choanae. After achieving posterior mobility, we moved to the endonasal approach. The left nasal cavity was entered, and the mass was seen filling the nasal passage (Figure 3). The mass was removed in three separate sections in a similar fashion as described by Ruiz et al.4 The inferior section of the tumor was coagulated and transected in an anterior to posterior fashion. Because we had already released the posterior aspect of the tumor via the intranasal approach, it was able to be delivered transtemporally with ease (Figure 4). The mass was then delivered from the sphenoid and ethmoid sinuses using the Coblator and a Bicladely. The 3.5 mm sphenoïd roof dehiscence noted on imaging was confirmed on direct visualization, but dura was intact and no CSF leak was noted (Figure 5). Lastly, the remaining tumor in the pterygopalline fossa was removed via a wide maxillary antrostomy and elevation of a mucosal flap along the posterior wall of the maxillary sinus. The sphenopalatine artery was identified and coagulated with Bipolar forces. Half inch packing was lightly packed into the left nasal cavity. Estimated blood loss was 200 mL, and the case length was 135 minutes. Pathologic evaluation of the tumor was consistent with JNA. Fibroblastic tissue with numerous vascular channels was seen on hematoxylin stain. Beta-catenin and androgen receptor immunohistochemistry (Figure 7) were also diffusely positive. Packing was removed on the first postoperative day, and he was discharged home. On two month follow-up, the patient has had no further epistaxis and he is recurrence free.

DISCUSSION
Endoscopic excision of JNAs has proven to have less blood loss, fewer complications, and shorter hospital stay compared to traditional open approaches.5,6,7 The difficulties with typical endoscopic tumor excision include adequate access, multiple instruments, and bleeding. The Coblator Evac70 Xtra Plasma Wand has suction, saline irrigation, and bipolar coagulation and cutting capabilities all located at the instrument head. This allows tissue excision and hemostasis to be accomplished with a clear field of view.8,9 Thus, there is less necessity to pass additional instruments, leading to more efficient resection. The Coblator operates between 40°C and 70°C. Working at lower temperatures causes less collateral damage to surrounding tissues, thus being potentially safer than electrocautery.7 Use of Coblation radiofrequency is a relatively novel technique for resection of JNAs.10 Ruiz et al have shown that endoscopic excision of Radkowski stage IIC tumors is possible with Coblation radiofrequency even without pre-operative embolization, with an estimated blood loss of 400mL in 160 minutes.10 Cannon et al have excised Radkowski stage IIIA tumors successfully, but with preoperative embolization.11 Ye et al successfully used Coblation to resect 11 Fisch class I tumors with less blood loss (121 mL vs 420 mL) and faster operative time (87 min vs 136 min) compared to 12 other Fisch class I tumors using standard endoscopic instrumentation.12 Our estimated blood loss (200 mL) and operating time (135 minutes) are in line with the above studies.

CONCLUSION
Here we describe a report of Coblation assisted resection with traditional open approach and suggests that Coblation may be used in JNA resection with traditional open approach and suggests that Coblation may be used in JNA resection. This provides another example of the utility of Coblation for endoscopic JNA excision, with the addition of a highly useful transnasal component.

REFERENCES

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