Section: Otorhinolaryngology

Case Series

ENDOSCOPIC COBLATION RESECTION OF STAGE IIA JUVENILE NASOPHARYNGEAL ANGIOFIBROMA WITHOUT PREOPERATIVE EMBOLIZATION: A CASE SERIES

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ABSTRACT

Background: Juvenile nasopharyngeal angiofibroma (JNA) is a rare, benign yet highly vascular tumour that predominantly affects adolescent males. Surgical excision is the mainstay of treatment and is commonly preceded by preoperative embolisation to reduce intraoperative blood loss. However, embolisation may not always be feasible in resource-limited settings.

Case Series Presentation: We report a case series of four male patients aged 14–16 years who presented with progressive nasal obstruction and recurrent epistaxis. Radiological evaluation confirmed Juvenile nasopharyngeal angiofibroma. Due to logistic constraints, preoperative embolisation was not performed. All tumours were successfully excised via an endoscopic approach using Coblation following a mega middle meatal antrostomy, without the need for Caldwell-Luc procedure or Denker's procedure approaches. Mean intraoperative blood loss was approximately 100 mL, and none of the patients required blood transfusion. Postoperative recovery was uneventful, with no evidence of recurrence at three-month follow-up.

Conclusion: This case series demonstrates the feasibility and safety of coblator-assisted endoscopic excision of early-stage JNA without preoperative embolisation. Coblation technology, characterised by minimal thermal injury and effective haemostasis, may serve as a viable alternative in centres without access to interventional radiology facilities.

Keywords: Juvenile nasopharyngeal angiofibroma; endoscopic surgery; Coblation; embolisation-free; minimally invasive ENT

INTRODUCTION

Juvenile nasopharyngeal angiofibroma (JNA) accounts for less than 0.05% of head and neck tumours but presents significant surgical challenges because of its marked vascularity and potential for local invasion.[1] It predominantly affects adolescent males and, despite its benign histopathology, requires meticulous preoperative planning due to the risk of profuse intraoperative haemorrhage.[1,2]

Preoperative embolisation has been widely adopted to reduce intraoperative blood loss and improve surgical field visibility.[1,2] However, embolisation is not universally available, particularly in resource-limited settings, and may be associated with complications such as cranial nerve palsy, non-target embolisation, and inadvertent cerebral infarction.[3,4]

Advancements in endoscopic skull base surgery and instrumentation have expanded the role of minimally invasive techniques in the management of JNA.[5] Coblation technology, which employs controlled radiofrequency plasma-mediated ablation, facilitates precise tumour dissection with simultaneous haemostasis while minimising thermal injury to adjacent tissues.[6] This approach may potentially reduce reliance on preoperative embolisation in selected early-stage tumours.

In this report, we present a case series of Stage IIA JNA managed successfully using a coblator-assisted endoscopic approach without preoperative

embolisation, underscoring its feasibility in centres lacking access to interventional radiology facilities.

MATERIALS AND METHODS

Case Presentation

We report a case series of four adolescent males aged 14–16 years who presented with a 4–6 month history of progressive unilateral (left-sided) nasal obstruction and intermittent epistaxis. None of the patients reported visual disturbances, facial swelling, headache, or neurological deficits.

Clinical Examination

Diagnostic nasal endoscopy revealed a reddish, highly vascular mass occupying the nasopharynx and extending into the posterior nasal cavity. [Figure 1]

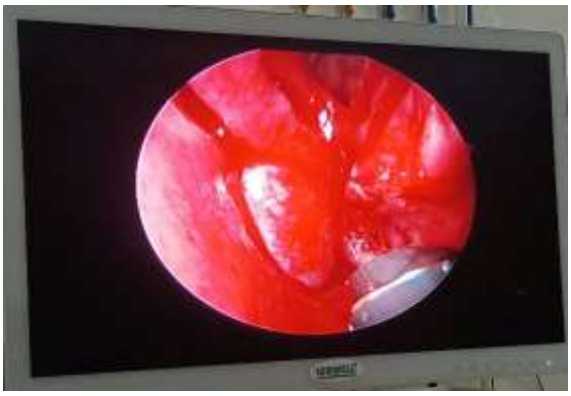

Figure 1: Nasal endoscopic view showing a reddish vascular mass arising from the nasopharynx.

Investigations

Contrast-enhanced computed tomography (CECT) demonstrated a homogeneously enhancing, non-encapsulated soft tissue mass arising from the nasopharynx with extension into the left pterygopalatine fossa (Figure 2). There was no evidence of bony destruction, intracranial extension, or orbital involvement. Radiological findings were consistent with Juvenile nasopharyngeal angiofibroma according to the Radkowski staging system.[1]

Figure 2: Contrast-enhanced CT scan showing a soft tissue lesion in the nasopharynx extending into the left pterygopalatine fossa.

Treatment

Due to logistical constraints and the unavailability of preoperative embolisation, surgical excision was planned via an endoscopic approach using coblation technology.

Under general anaesthesia, partial resection of the middle portion of the inferior turbinate was performed to facilitate a mega middle meatal antrostomy. A transnasal removal of the posterior wall of the maxillary sinus was carried out to access the pterygopalatine fossa. The internal maxillary artery was identified and ligated endoscopically to reduce intraoperative bleeding.

The tumour was dissected and excised en bloc using a coblator wand (Smith & Nephew EVAC 70), allowing simultaneous plasma-mediated tissue ablation and haemostasis. No external approaches such as the Caldwell-Luc procedure or Denker's procedure were required.[5,7] [Figure 3]

Figure 3: Excised tumour specimen.

Outcome and Follow-Up

Mean intraoperative blood loss was approximately 100 mL. No patient required blood transfusion. The surgical field remained consistently clear, and the average operative duration was approximately 90 minutes.

All patients had an uneventful postoperative recovery and were discharged on postoperative day three. Follow-up nasal endoscopy at 2 weeks and 3 months revealed a well-healed surgical cavity with no evidence of residual or recurrent tumour.

Histopathological examination confirmed Juvenile nasopharyngeal angiofibroma, demonstrating fibrovascular stroma composed of thin-walled, branching vascular channels lined by endothelium. [Figure 4]

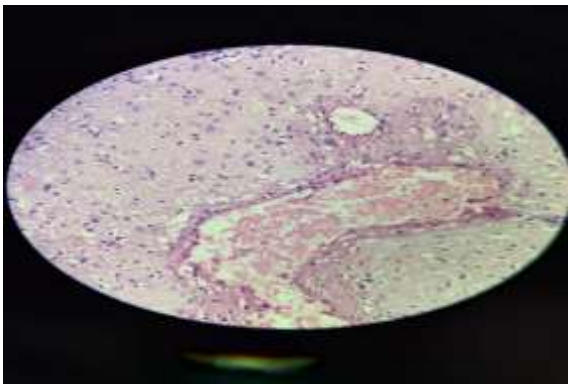

Figure 4: Histopathological section showing fibrovascular stroma with thin-walled blood vessels.

Table 1: Clinical, Radiological and Surgical Profile of Patients with Stage IIA Juvenile Nasopharyngeal Angiofibroma

Case No.	Age (years)	Presenting Symptoms	Duration of Symptoms	Stage (Radkowski)	Extension on CECT	Preoperative Embolisation	Surgical Approach	Intraoperative Blood Loss (mL)	Operative Time (min)	Blood Transfusion	Hospital Stay (days)	Recurrence
1	14 yrs	epistaxis, unilateral nasal obstruction, and mass in nasopharynx	5 months	IIB	Left pterygopalatine fossa	No	Endoscopic coblation with MMA	110	90	No	4	No
2	15 yrs	epistaxis, unilateral nasal obstruction, and mass in nasopharynx	4 months	IIA	Left pterygopalatine fossa	No	Endoscopic coblation with MMA	90	85	No	3	No
3	16 yrs	epistaxis, unilateral nasal obstruction, and mass in nasopharynx	4 months	IIA	Left pterygopalatine fossa	No	Endoscopic coblation with MMA	120	95	No	3	No
4	15 yrs	epistaxis, unilateral nasal obstruction, and mass in nasopharynx	5 months	IIA	Left pterygopalatine fossa	No	Endoscopic coblation with MMA	110	88		4	No

DISCUSSION

Juvenile nasopharyngeal angiofibroma (JNA) is a benign yet locally aggressive vascular tumour that predominantly affects adolescent males.[1] Despite its benign histology, its marked vascularity and propensity for local extension into adjacent anatomical spaces render surgical excision technically challenging.[1,2] The foremost intraoperative concern remains significant haemorrhage.

Role of Preoperative Embolisation

Preoperative embolisation has traditionally been recommended to reduce intraoperative blood loss and improve surgical field visibility.[2,3] Several studies have reported a reduction in transfusion requirements and operative time following embolisation, with some demonstrating up to an 85% reduction in intraoperative blood loss.[3] However, embolisation is not devoid of risk. Documented complications include cranial nerve palsy, central retinal artery occlusion, stroke, non-target embolisation, and tissue necrosis.[4,5]

Additionally, embolisation increases overall treatment cost and may not be readily available in resource-limited settings due to lack of interventional radiology facilities. These constraints can delay definitive surgical management.

In our case series, embolisation was not performed due to logistical limitations. Nevertheless, mean intraoperative blood loss was modest (102.5 ± 12.6 mL), and none of the patients required transfusion. These findings suggest that in carefully selected early-stage tumours (Radkowski Stage IIA), embolisation may not be mandatory when meticulous surgical planning and advanced haemostatic techniques are utilised.[6]

Endoscopic Management of Early-Stage JNA

Advancements in endoscopic skull base surgery have significantly transformed the management paradigm of JNA.[6,7] Endoscopic approaches provide superior magnification, angled visualisation, and enhanced access to the pterygopalatine fossa while avoiding facial incisions and osteotomies associated with open techniques.[7] For early-stage disease, endoscopic resection has demonstrated comparable oncological

outcomes with reduced morbidity and shorter hospital stay.[6,8]

In our series, complete tumour excision was achieved endoscopically without resorting to external approaches such as the Caldwell-Luc procedure or Denker's procedure.[7,8] Avoidance of these approaches reduces the risk of facial swelling, infraorbital nerve paraesthesia, dental numbness, oroantral fistula, and cosmetic deformity.

Role of Coblation Technology

Coblation technology utilises radiofrequency-generated plasma to achieve controlled tissue ablation at relatively low temperatures (40–70°C), thereby minimising collateral thermal injury. It provides simultaneous coagulation, which is particularly advantageous in highly vascular tumours such as JNA. Compared to conventional electrocautery, coblation has been associated with improved surgical field clarity, reduced thermal damage, and potentially decreased postoperative pain and adhesion formation.

In our series, favourable intraoperative parameters—including minimal blood loss, absence of transfusion requirement, and a reasonable operative time (89.5 ± 4.2 minutes)—may be attributed to:

- Early identification and endoscopic ligation of the internal maxillary artery
- Adequate exposure via mega middle meatal antrostomy
- Effective plasma-mediated haemostasis using coblation.[6]

Our experience aligns with emerging evidence suggesting that in selected Stage I–IIA JNA cases, embolisation may not be essential when advanced endoscopic techniques and haemostatic technologies are employed.[8]

Implications for Resource-Limited Settings

The principal contribution of this study lies in demonstrating a feasible, safe, and resource-conscious alternative for managing early-stage JNA without reliance on embolisation. In centres lacking access to interventional radiology, coblator-assisted endoscopic excision may provide an effective strategy without compromising surgical outcomes (6,9). This approach may significantly broaden access to definitive treatment in low- and middle-income healthcare settings.

CONCLUSION

Coblator-assisted endoscopic excision of Juvenile nasopharyngeal angiofibroma (Radkowski Stage IIA) can be performed safely and effectively without preoperative embolisation in carefully selected patients. In our series, this approach achieved complete tumour removal with minimal blood loss, no transfusion requirement, and no early recurrence. By combining meticulous endoscopic technique, early vascular control, and plasma-mediated haemostasis, coblation offers a viable, cost-conscious alternative in centres where interventional radiology services are unavailable. Larger studies with longer follow-up are warranted to validate its broader applicability and long-term oncological outcomes.

Learning Points

- Coblator-assisted endoscopic excision of Juvenile nasopharyngeal angiofibroma can be safely and effectively performed without preoperative embolisation in carefully selected early-stage (Radkowski I–IIA) cases.
- Coblation technology offers precise tissue dissection with simultaneous haemostasis and minimal thermal injury, making it particularly advantageous for highly vascular tumours.
- A purely endoscopic approach can obviate the need for external procedures such as the Caldwell-Luc procedure or Denker's procedure, thereby reducing morbidity and improving cosmetic outcomes.
- Individualised surgical planning—based on tumour stage, anatomical extent, vascular control strategy, and institutional resource availability—is essential for optimising outcomes in JNA management.

REFERENCES

1. Radkowski D, McGill TJ, Healy GB, Ohlms L, Jones DT. Angiofibroma: changes in staging and treatment. Arch Otolaryngol Head Neck Surg. 1996;122(2):122–129.
2. Lloyd G, Howard D, Phelps P, Cheesman A. Juvenile angiofibroma: the lessons of 20 years of modern imaging. J Laryngol Otol. 1999;113(2):127–134.
3. Elhammady MS, Peterson EC, Aziz-Sultan MA. Preoperative embolization of juvenile nasopharyngeal angiofibroma: transarterial versus direct tumoral puncture. World Neurosurg. 2011;76(3–4):328–334.
4. Wormald PJ, van Hasselt A. Endoscopic removal of juvenile angiofibroma. Laryngoscope. 2003;113(4):592–595.
5. Nicolai P, Schreiber A, Villaret AB, et al. Endoscopic surgery for juvenile angiofibroma: when and how. Laryngoscope. 2003;113(5):775–782.
6. Snyderman CH, Pant H, Carrau RL, Gardner P, Prevedello D. Minimally invasive endoscopic approaches in skull base surgery. Skull Base. 2007;17(2):73–78.
7. Szymańska A, Szymański M, Czekajska-Chehab E, Szczerbo-Trojanowska M. Juvenile nasopharyngeal angiofibroma: current methods of diagnosis and treatment. Med Sci Monit. 2017;23:1861–1869.
8. Hazarika P, Nayak DR, Balakrishnan R. Coblation tonsillectomy versus conventional dissection tonsillectomy: a prospective study. Indian J Otolaryngol Head Neck Surg. 2009;61(3):183–186.