

# Coblator Assisted Endonasal Endoscopic Excision of Juvenile Nasopharyngeal Angiofibroma

Vinod Gite<sup>1</sup>, Shashikant Mhashal<sup>1</sup>, Mohammed Shoeb<sup>2</sup>, Samir Bhargava<sup>3</sup>

## ABSTRACT

**Introduction:** Coblator uses a single wand for coagulation, tissue ablation and suction at low temperature and proven safe for procedures such as tonsillectomy, adenoidectomy, and oral cancer resections making it useful tool in other areas of endoscopic surgery. Study was undertaken to introduce and outline the advantages of an endoscopic coblation-assisted excision of juvenile nasopharyngeal angiofibroma (JNA).

**Material and Methods:** Total of 8 male patients undergoing an endoscopic Coblator assisted excision of JNA (Fisch stage I two cases and stage II 4 cases and stage III 2 cases) were reviewed. Pre op Embolization of feeding vessels was done. The tumours were then coblated via an endoscopic approach using a Coblator with Evac 70 Plasma Wand.

**Results:** All patients achieved complete removal of their tumor. Coblation provided a controlled and relatively bloodless excision of the JNAs without requiring the usage of multiple instruments, including bipolar and suction cautery.

**Conclusions:** Coblation assisted endonasal endoscopic resection of JNA is a feasible technique that can be performed with minimal morbidity and low intraoperative blood loss supporting complete resection of JNA tumours using minimally invasive technique.

**Keywords:** Endonasal Endoscopic, Juvenile Nasopharyngeal Angiofibroma

## INTRODUCTION

Juvenile Nasopharyngeal Angiofibroma (JNA) is a benign, locally aggressive tumor primarily effecting adolescence males. Its high vascular nature makes complete resection a difficult process with further concern for diffuse blood loss.<sup>1</sup>

After Kamel's description of endoscopic endonasal resection in 1996 focus on improving minimally invasive endoscopic methods has been increased. Less cosmetic deformities, short postoperative recovery time, and reduced intraoperative bleeding are considerable benefits of the endoscopic approach.<sup>2,3</sup> When combined with pre op embolization of feeding vessels, intra op bleeding is greatly reduced.<sup>4,5</sup>

It is our belief that endoscopic Coblator-assisted resection combined with embolization, is an equally effective method of endoscopic surgery. Coblation-assisted resection of JNA, in addition to the above portrayed benefits, it offers many other advantages over the other methods like - minimizing the number of instruments required for each procedure, reduces intraoperative hemorrhage, limits injury to adjacent healthy tissues and helps in complete removal and preventing recurrences. In this study, we present eight cases of JNA to illustrate our findings. We summarize the presentation, treatment and outcome to emphasize the advantages of Coblator assisted trans-nasal surgery.

## METHOD AND MATERIALS

With Ethical committee approval and after informed consent

from the patients, 8 patients falling into inclusion criteria were reviewed for operative management of JNA in Jan 2015- May 16 at HBT Medical College and Dr. R. N. Cooper Hospital, Mumbai.

**Inclusion criteria:** Fisch type I, II and III (with minimum lateral extension) cases of JNA based on history, clinical examinations and Radiological assessment.

**Exclusion criteria:** Fisch type III (more lateral extension) and Fisch type IV (intracranial extension) cases of JNA.

## Steps of methodology

Complete history, clinical examinations and Radiological assessment (Fisch staging - Figure-1 and 2) was done for all the patients. Pre op embolization of feeding vessel was done after that. It was followed by endoscopic examination under general anaesthesia. Following operative procedures were followed after this-

- Lower part of middle turbinate cut. (Figure-3B)
- Maxillary ostia widened and posterior wall of maxilla removed.
- Internal maxillary vessel clipped.
- Medial attachments from roof of nasopharynx, post end of septum and surrounding tissue is removed. (Fig 3-C and D)
- Lateral attachment removal done.

For all patients, Coblator II System with Evac 70 Plasma Wand was used in the present study. Patients were assessed for time taken for surgery, blood loss, blood loss per minute, nasal pack removal day, hospital stay and any other complications.

## Procedure

Coblator assisted endonasal endoscopic excision done.

## STATISTICAL ANALYSIS

Descriptive statistics like mean and percentages were used to interpret results. Tables were made with the help of Microsoft office 2007.

## RESULTS

All patients (with stage I, II, early stage III JNA) achieved symptomatic relief and complete excision using the Coblator II System. Surrounding healthy tissue showed no detectable injury

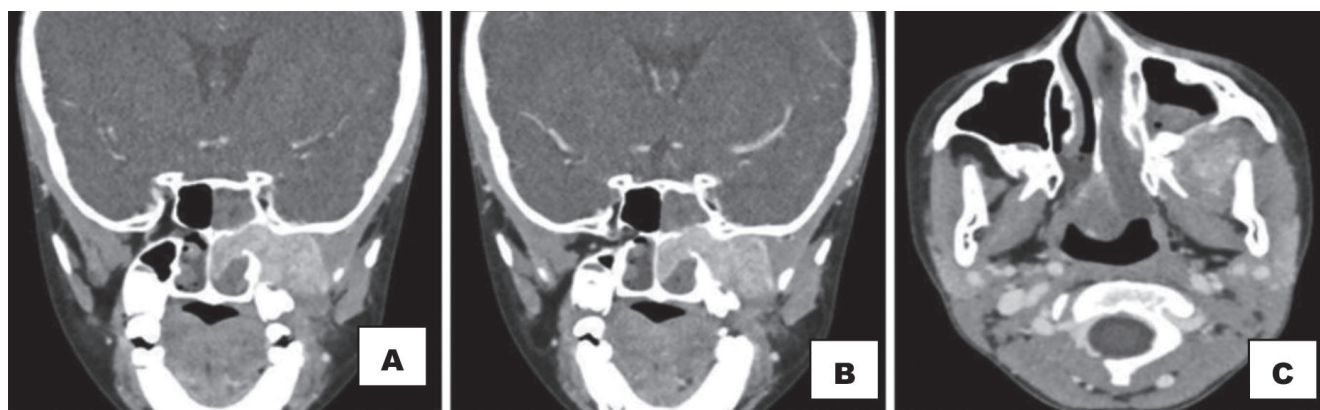
<sup>1</sup>Assistant Professor, <sup>2</sup>Senior Resident, <sup>3</sup>Hon. Consultant, HBT Medical College and Dr Rn Cooper Hospital, Mumbai 400056, Maharashtra, India.

**Corresponding author:** Dr Mohammed Shoeb, 202, Second Floor, Rmo Quarters, Dr R N Cooper Hospital Complex, Vile Parle West, Mumbai 400056, Maharashtra, India.

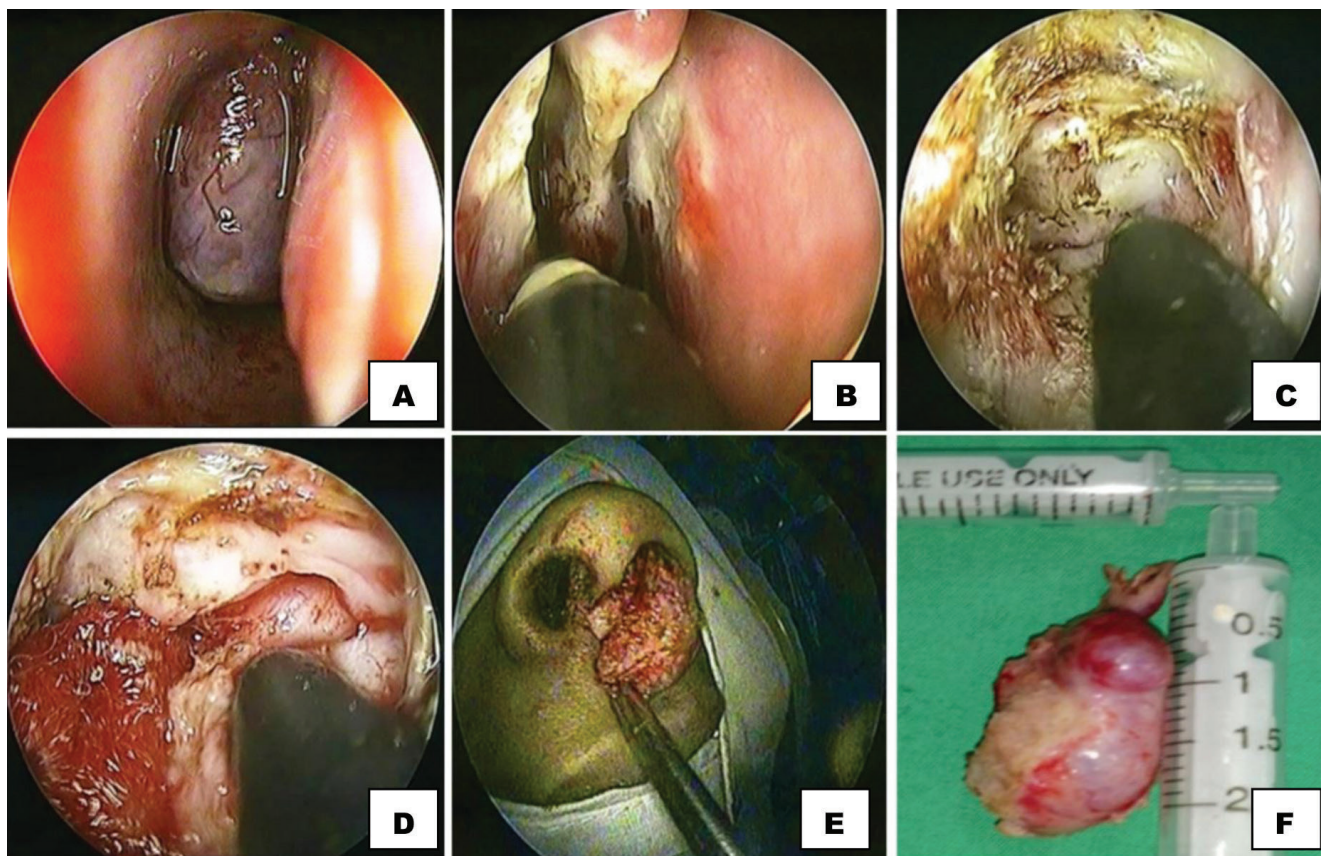
**How to cite this article:** Vinod Gite, Shashikant Mhashal, Mohammed Shoeb, Samir Bhargava. Coblator Assisted Endonasal Endoscopic Excision of Juvenile Nasopharyngeal Angiofibroma. International Journal of Contemporary Medical Research 2016;3(9):2622-2624.



**Figure-1:** A and B. CECT PNS – Approx. 3.7x2.5x2 cms. Well defined isodense lesion Intense homogeneous contrast enhancement within posterior part of left nasal cavity abutting left middle and inferior turbinates protruding into nasopharynx through posterior choana. C. Postero superior extension just lateral to medial pterygoid plate.



**Figure-2:** CECT PNS A) Widening of pterygopalatine fossa and pterygomaxillary fissure. B) Destruction of inferior wall of sphenoid. C) Extension upto infratemporal fossa.



**Figure-3:** A) JNA attached to lower part of middle turbinate. B) Excision from lower part of middle turbinate. C) Nasopharyngeal attachment excision. D) Excision of lateral extension (medial plate) E) Transnasal delivery of specimen. F) Specimen of approx. size 3.5 x 2.5 cms.



Stage	No. of patients	Mean Age of Patient (years)	Mean Procedure time	Mean Blood loss intra OP	Mean Blood loss per minute	Nasal pack removal day	Patient discharged on
Fisch I	02	12.5	100 mints	65 cc	0.650 ml/mint	POD#2	POD#3
Fisch II	04	19.25	123 mints	105 cc	0.857 ml/mint	POD#2	POD#3
Fisch III	02	14.5	134 mints	126 cc	0.940 ml/mint	POD#2	POD#3

**Table-1:** Summary of intra operative parameters and post op recovery

on follow-up endoscopic exam. Youngest patient presented to us was 10 years old while oldest was 21 years with mean age 15.2 years. Minimal surgical time taken for procedure was 80 minutes while maximum was 160 minutes. Minimal intra op blood loss was 60 ml while maximum was 132 ml with mean blood loss of 65ml, 105ml and 126ml respectively for FISCH type I, II and III groups. Approx. 0.65 ml per minute blood loss was noted in Fisch stage I disease while it was approx. 1 ml per minute for stage III JNA. In all patients we removed nasal packs on post op day 2 and all patients were discharged after 24 hours observation except one patient of Fisch type II who got discharge on 5<sup>th</sup> day. Summary of intra operative parameters and postoperative recovery is shown in Table-1.

## DISCUSSION

JNA can be treated by different modalities but surgical resection remains the preferred primary treatment modality.<sup>6</sup> Coblator uses a single wand for coagulation, tissue ablation and suctioning purpose. It is proven safe for procedures such as tonsillectomy, adenoidectomy, and oral cancer resections making it useful tool in other areas of endoscopic surgery.<sup>7,8</sup> Excision of JNA remains a difficult task regardless of the method chosen to remove it. However, Coblator may reduce the number of surgical steps and instruments used to achieve hemostasis during resection. Its simultaneous hemostasis and low heat production minimizes visual field obstruction due to bleeding.<sup>8</sup> Minimal post OP complications and fasten patient recovery prove Coblator effective. Tumor extension and intra op bleeding imposes considerable challenges with high recurrence.<sup>9</sup>

The mean operative time for our study was 100 minutes, 123 minutes, 134 minutes and mean intra operative bleeding was 65 ml, 105 ml, and 126 ml in stage I, II, III respectively.

Ye L(1), Zhou X, Li J, Jin J<sup>10</sup> reported the mean tumour resection time for coblation and traditional endoscopic instruments as 87 and 136 minutes, respectively ( $t = 9.962$ ,  $p < 0.001$ ) and mean intra-operative blood loss was 121 and 420 ml, respectively ( $t = 28.944$ ,  $p < 0.001$ ), a significant difference. This is suggestive of significance difference in blood loss intraoperatively when compared with traditional methods.

Ruiz JW<sup>11</sup> et al concluded that total surgical times were 105, 160, and 150 min and the estimated blood losses were 150, 400, and 130 mL, respectively. This yielded a blood loss per minute rate of only 1.4, 2.5, and 0.9 mL/min for the respective cases. None of their patients required post-operative blood transfusion, nasal packing, or hospitalization of greater than one day.

Pierson B et al<sup>12</sup> used Coblator in two case with stage 3b and 4 for debulking and noted significant decrease in blood loss intraoperatively. Cannon DE et al<sup>13</sup> in their study of 4 cases assisted by Coblator found it effective, safe and efficient in Fisch type 1, 2 and early type 3.

## CONCLUSION

Our proposed method of endonasal endoscopic resection using

the Coblator II System in stage I, II and III cases may limit the need for multiple instruments, blood transfusion, surgical time, blood loss per minute and improve post operative recovery without any complications. Additional studies are necessary to comprehensively evaluate further applications for Coblator-assisted resection of JNA.

## REFERENCES

- Solomon D, Isaacson G. Transoral "adenoidectomy" excision of juvenile nasopharyngeal angiofibroma. *Ann Otolaryngology, Rhinology and Laryngology*. 2007;116:243-247.
- Pryor SG, Moore EJ, Kasperbauer JL. Endoscopic versus traditional approaches for excision of juvenile nasopharyngeal angiofibroma. *Laryngoscope* 2005;115:120-1207.
- Chen MK, Tsai YL, Lee KW, et al. Strictly endoscopic and harmonic scalpel-assisted surgery of nasopharyngeal angiofibromas: eligible for advanced stage tumors. *Acta Oto Laryngol*. 2006;126:1321-1325.
- Siniluoto MJ, Luotonen JP, Tikkakoski TA. Value of pre-operative embolization in surgery for nasopharyngeal angiofibroma. *J Laryngology Otolaryngology*. 1993;107:514-521.
- Roger G, Tran Ba Huy P, Froehlich P, et al. Exclusively endoscopic removal of juvenile nasopharyngeal angiofibroma. *Arch Otolaryngology Head Neck Surg*. 2002;128:928-935.
- Mair EA, Battista A, Casler JD. Endoscopic laser-assisted excision of juvenile nasopharyngeal angiofibroma. *Arch Otolaryngol Head Neck Surg*. 2003;129:454-459.
- Belloso A, Chidambaram A, Morar P, et al. Coblation tonsillectomy versus dissection tonsillectomy: postoperative hemorrhage. *Laryngoscope*. 2003;113:2010-2013.
- Carney AS, Timms MS, Marnane CN, et al. Radiofrequency coblation for the resection of head and neck malignancies. *Otolaryngology Head Neck Surg*. 2008;138:81-85.
- Douglas R, Wormald PJ. Endoscopic surgery for juvenile nasopharyngeal angiofibroma: where are the limits? *Curr Opin Otolaryngology Head Neck Surg*. 2006;14:1-5.
- Ye L, Zhou X, Li J, Jin J. Coblation-assisted endonasal endoscopic resection of juvenile nasopharyngeal angiofibroma. *J Laryngol Otol*. 2011;125:940-4.
- Ruiz JW, Saint-Victor S, Tessema B, Eloy JA, Anstead A. Coblation assisted endoscopic juvenile nasopharyngeal angiofibroma resection. *Int J Pediatr Otorhinolaryngol*. 2012;76:439-42.
- Pierson B, Powitzky R, Digoy GP. Endoscopic Coblation for the treatment of advanced juvenile nasopharyngeal angiofibroma. *Ear Nose Throat J*. 2012;91:432,434,436, 438.
- Cannon DE, Poetker DM, Loehrl TA, Chun RH. Use of coblation in resection of juvenile nasopharyngeal angiofibroma. *Ann Otol Rhinol Laryngol*. 2013;122:353-7.

**Source of Support:** Nil; **Conflict of Interest:** None

**Submitted:** 15-07-2016; **Published online:** 01-09-2016