



## DIFFERENT APPROACHES OF JUVENILE NASOPHARYNGEAL ANGIOFIBROMA

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**ABSTRACT** **Objective:** objective of the study was to evaluate the efficacy and Outcome of Trans nasal endoscopic approach as route for removal of angiofibroma.

To briefly study the different approaches adopted for angiofibroma.

**Method:** Retrospective study was undertaken of 20 patients treated for angiofibroma presenting to our department of Otorhinolaryngology, Civil hospital, Ahmedabad between Aug. 2016 till Aug. 2017.

As per review of the records, data were collected according to the Patient's characteristics, stage of angiofibroma, surgical techniques, and complications.

**Result:** Patients who undergo endoscopic trans nasal approach had reduced intraoperative blood loss, reduced post-operative complication and reduced hospital stay.

**Conclusion:** Rare, benign, vascular tumour found almost exclusively in young males. Surgery is the gold standard with a trend towards endoscopic approaches. Frequent follow-up after treatment is necessary

**KEYWORDS :** Juvenile nasopharyngeal angiofibroma,,Sphenopalatine region,maxillary sinus, Endoscopic transnasal

### INTRODUCTION:

Juvenile nasopharyngeal angiofibroma (JNA) represents 0.05% to 0.5% of all head and neck tumors but is the common tumor of nasopharynx. It affects almost exclusively male adolescents. The median age at diagnosis is 15 years. Histological benign appearance is often counterbalanced by a potentially malignant clinical course, due to severe epistaxis, involvement of endocranial structures with occasional surgical difficulties and complications, and a high incidence of recurrence.

Patients usually present at late stage of the disease that arises from either the lateral wall or the roof of the nasopharynx especially the sphenopalatine foramen. The blood supply is most commonly from the internal maxillary artery. Histologically tumor blood vessels typically lack smooth muscle and elastic fibres. Severe epistaxis accompanied by progressive nasal obstruction are the classical symptoms of juvenile angiofibromas at the time of presentation.

There are a variety of staging criteria developed when evaluating JNAs which include those developed by Radkowski, Fisch, Andrews, Onerci and Sessions. Its classical treatment is surgery; however there are cases in which may indicate radiotherapy or even hormone therapy and gamma knife surgery (GKS).

Currently it is advisable to perform a selective tumoral embolization prior to proceeding with any of the techniques known in order to facilitate surgical access. Advances in technology and improvements in end nasal technique enable the use of nasal endoscopic surgery to remove some tumors that would traditionally have been extracted by using an open surgical approach.

### SITE OF ORIGIN AND GROWTH:

It arises from the posterior part of the nasal cavity close to the superior margin of sphenopalatine foramen from here tumor grows into the nasal cavity, nasopharynx and into the pterygopalatine fossa running behind the posterior wall of maxillary sinus. Laterally tumor extends into the pterygomaxillary fossa and thence to infratemporal fossa and cheek.

### PATHOLOGY:

The exact etiology of tumor is unknown but it tends to develop in males between 10 and 25 years old. The vessels are just endothelium lined spaces with no muscle coat therefore severe bleeding may occur on taking biopsy and surgical removal as these vessels cannot contract to stop bleeding.

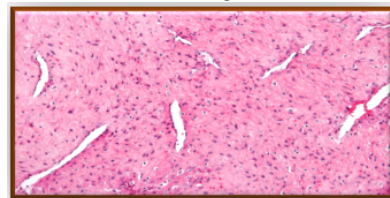
**Macroscopic** – Well-defined, spongy lobulated tumours with nodules covered by nasopharyngeal mucosa (squamous epithelium). Nodularity increases with age. On section, tumour is reticulated, whorled or spongy in appearance lacking a true capsule.

**Microscopic:** Consists of proliferating, irregular vascular channels within a fibrous stroma.

Vascular component is more in young tumours and as age increases, collagen content increases.

Fibrous tissue increases towards periphery and vascular element tends to be more central.

Tumour blood vessels typically lack smooth muscle and elastic fibres, this is the reason for sustained bleeding.



**Fig,1 shows Lack of smooth muscle and elastic fibres in histological slide**

### CLINICAL FEATURES:

Nasal obstruction Intermittent unprovoked epistaxes Chronic anaemia may be present due to repeated epistaxis.

Complete nasal obstruction may cause stasis of secretions and may also lead to sepsis.

Patients may have hyposmia or anosmia. Blockage of ET orifice may cause deafness and otalgia.

Headache may be present due to chronic sinusitis history or intracranial extension.

Pressure on optic chiasma due to erosion of mass into the cranial cavity may cause diplopia.

Tenting of the optic nerve by tumour mass may cause failing vision

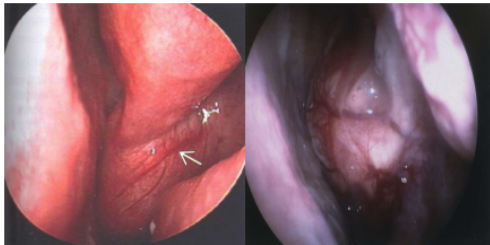
**Anterior rhinoscopy:** Abundant purulent nasal secretions.

Bowing of nasal septum to uninvolved side.



**Fig.2:shows right side nasal mass (angiofibroma)**

On Posterior rhinoscopy: Pink or red mass filling the nasopharynx can be seen.



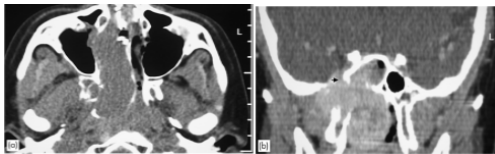
**Fig.3:nasal endoscopic examination show pink mass.**

**Investigations**

**CT PNS**

The exact extent or stage of the tumour can only be determined by a combination of CT and MR imaging and this is vital for planning the surgical resection.

CT is excellent for bone detail. Both plain and contrast (lesion enhances) CT should be done. CT reveals the extent of the lesion and helps in staging of the disease.



**Fig 4 a) Axial and (b) coronal ct images of type 3a ,right sided juvenile angiofibroma. There is destruction of the pterygoid plates and extension of tumour through the skull base**

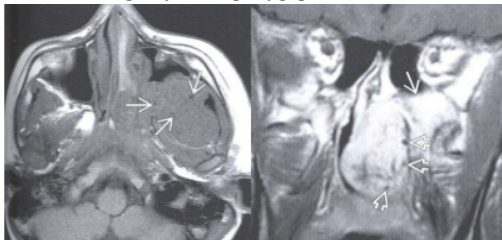
**MRI**

**Axial MRI : T1 showing**

- Heterogenous intermediate signal
- Flow voids representing enlarged vessels
- Extension into nasopharynx and masticator space

**Coronal MRI : T1 with contrast showing**

- Diffuse intense enhancement
- Multiple flow voids within hyper vascular mass
- Extension into nasopharynx and pterygopalatine fossa



**Fig.5:MRI finding suggestive of homogenous nasal mass**

**AIMAND OBJECTIVE:**

To evaluate the efficacy and Outcome of Transnasal endoscopic approach as route for removal of angiofibroma To briefly study the different approaches adopted for angiofibroma.

**METHOD AND MATERIAL:**

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angiofibroma presenting to our department of Otorhinolaryngology, Civil hospital, Ahmedabad between Aug. 2016 till Aug. 2017.

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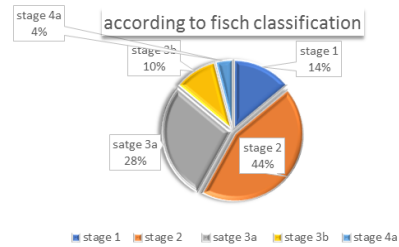
**DISCUSSION:**

**Staging systems**

**Fisch staging system:**

Type 1	Tumour limited to the nasopharyngeal cavity; bone destruction negligible or limited to the sphenopalatine foramen
Type 2	Tumour invading the pterygopalatine fossa or the maxillary, ethmoid or sphenoid sinus with bone destruction
Type 3a -	Tumour invading the infratemporal fossa or orbital region: without intracranial involvement
Type 3b -	Tumour invading the infratemporal fossa or orbital region: with intracranial extradural (parasellar) involvement
Type 4a -	Intracranial intradural tumour: without infiltration of the cavernous sinus, pituitary fossa or optic chiasma
Type 4b -	Intracranial intradural tumour: with infiltration of the cavernous sinus, pituitary fossa or optic chiasma

**Distribution of case**



**Approaches**

**Endoscopic endonasal techniques :**

These techniques became more widespread recently as there are advantages like

- reduced intra-op blood loss,
- fewer post-op complications,
- reduced length of hospital stay.

Fisch - type 1, type 2 and some type 3 (with limited medial invasion of the infratemporal fossa) are done through this technique.

Larger tumours and those extending across or through the skull base are difficult to remove through this technique.

**Procedure-**

After the induction of anaesthesia, the nose is prepared with a vasoconstrictor solution (4% cocaine or epinephrine 1:10,000).

The anterior end of the middle turbinate is resected.

An anterior ethmoidectomy together with removal of the medial wall of the maxillary sinus is done.

Access to the posterior wall of the antrum is gained.

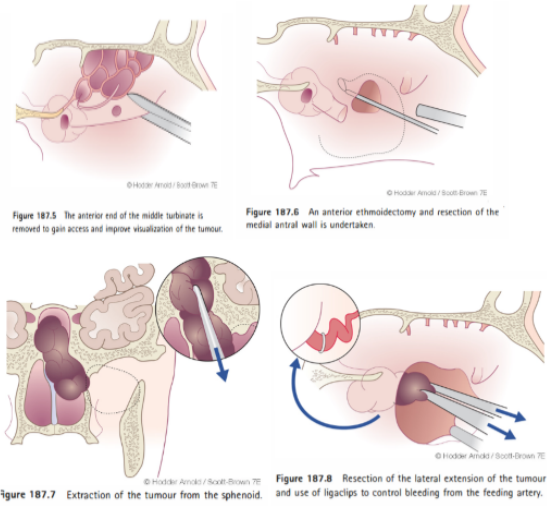
This wall is then removed to achieve complete lateral exposure of the tumour.

Dissection is then continued into the sphenoid until its rostrum is reached.

Tumour is peeled off inferiorly.

A similar technique can be used to deliver the lateral extension of the tumour into the operative field Bipolar diathermy is used throughout the procedure..

A second surgeon can be helpful in aiding the resection of larger tumours by applying the traction to the tumour and improve visibility by additional suction by accessing the nasal cavity through the contralateral nostril.



**Fig,7 Trans palatal approach**

**COMPLICATIONS:**

**Recurrence** – most common complication encountered.

reported in up to 25 percent of patients regardless of the method of treatment.

more likely in patients with advanced disease and in those treated by inexperienced surgeons.

The more younger the patient, the more likely that future recurrence will develop.

Prolonged clinical and radiological monitoring is necessary for all these patients in view of the very high incidence of recurrent disease.

Disease-free status five years after primary surgery probably represents cure.

Infraorbital nerve sensory deficits induced surgically and also nasal vestibular stenosis are recognized as a potential complication of mid-facial degloving,.

Prolonged nasal crusting may develop into ozaena  
Regular nasal douching with saline and the use of glucose in glycerine drops can alleviate this unpleasant complication.

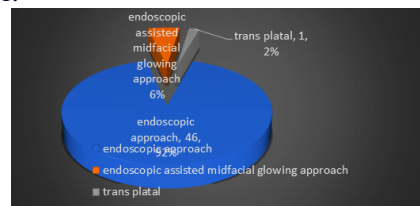
Ocular problems -  
Displacement of the globe caused by loss of bony support, Ophthalmoplegia, Visual loss may also be present.

**CONCLUSION:**

Rare, benign, vascular tumor found almost exclusively in young males.

Surgery is the gold standard with a trend towards endoscopic approaches. Frequent follow-up after treatment is necessary.

**RESULT:**



**Fig,8 Approach of surgery**

**Mid-facial degloving Approach:**

Mid-facial degloving technique is adopted by most surgeons than other transpalatal or lateral rhinotomy because of the exposure it gives.

It is a bilateral extended trans nasal maxillary approach.

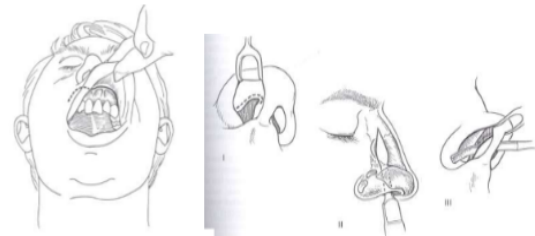
Anterior, medial and posterior walls of the maxillary antrum can be removed and a very large cavity that is confluent with the nasal cavity and post-nasal space is produced which gives adequate access for tumour removal together with control of its blood supply.

Extensions into the inferior part of the orbit and infratemporal fossa can also be removed.

There is no visible scarring and so cosmetically most feasible.

A sub labial degloving approach is suitable for larger tumours involving anteroinferior aspect of the nasal cavity and the infrastructure of the maxillary sinus, and particularly when access to the poster superior part of the nasal cavity is not satisfactory through other approaches.

Gingivo buccal incision is given.



**Fig 6:sublabial incision and transfixation incision**

Nasal intercartilaginous incisions with transfixation incision is given. Soft tissue elevation is done.

Mass in the nasopharynx is now accessible for removal.

Le fort I osteotomy is done.

**Trans palatal :**

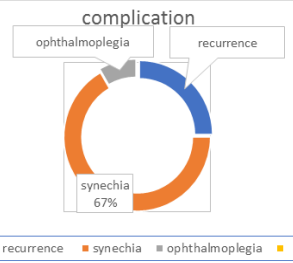
General anaesthesia is induced through an orotracheal tube.

A Dingman self-retaining retractor is used to expose the hard palate and the roof of the oral cavity.

An inverted U-shaped incision is outlined, extending from one maxillary tubercle to the other.

The mucosal incision is deepened through the mucoperiosteum upto the underlying bone of the hard palate.

Using a periosteal elevator, the posteriorly based bipediced mucoperiosteal flap of the palate is elevated.



**Fig,9 shows complication of endoscopic nasal surgery**

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