

## EXCISION OF NASOPHARNGEAL ANGIOFIBROMA BY MIDFACIAL DEGLOVING APPROACH

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**Objective:** To analyze the advantages of wide exposure by midfacial degloving approach for surgical excision of Juvenile Nasopharyngeal Angiofibroma.

**Material and Methods:** Fifteen (15) patients with Nasopharyngeal Angiofibroma were included in the study. All were operated with midfacial degloving approach. Five cases were operated with out emobilization and 5 cases with emobilization of the feeding vessel. 5 cases were operated after temporary ligation of the external carotid artery.

**Results:** 15 Patients were included in the study. Excision was done with mid facial degloving approach. Results were satisfactory regarding complete excision of the tumor with less post-operative complications and recurrence.

**Conclusion:** Midfacial degloving approach is an excellent approach providing wide exposure of infratemporal fossa, nasopharynx and skull base with less bleeding and no facial scar.

**Key words:** Juvenile Nasopharyngeal Angiofibroma, Midfacial degloving, emobilization.

### Introduction

Nasopharyngeal angiofibroma is a common benign tumor extremely vascular with locally aggressive behavior.

It is recognized since ancient times by hippocrate. It arises from spheno palatine foramen and nasopharynx. Rarely it is found at other sites in the nasal cavity and paranasal sinuses.<sup>1</sup>

It is seen in young males and has a tendency to recur if not completely excised.<sup>2,3</sup>

Internal maxillary artery is the main feeding vessel. The tumor consists of proliferating, irregular vascular channels within a fibrous stroma, covered by nasopharyngeal mucosa. Tumor blood vessels lack smooth muscles and elastic fibers, contributing to its reputation for sustained and profuse bleeding. It presents with progressive nasal obstruction and repeated attacks of severe nasal bleeding.<sup>4,5</sup> Other symptoms depend upon extent of the tumor into nasopharynx, Oropharynx, infratemporal fossa, orbit, paranasal sinuses and brain.

As tumor is exclusively found in adolescent males, there is speculation that androgen receptors are present in 75% of tumor, on both vascular and stromal elements. A much smaller proportion of the tumors have progesterone receptors but estrogen receptor have not been demonstrated.<sup>6</sup>

The angiogenic growth factor, vascular endothelial growth factor, (VEGF) has been found on both endothelial and stromal cells.<sup>7</sup> Which correlates with the proliferative marker k1 67.<sup>8</sup> Over expression of Insulin like growth factor II (IGF-II) has also been

found in large number of Juvenile angiofibroma. The IGF-II gene is situated on short arm of chromosome 11. It is thought that over expression of IGF-II might be associated with tendency of recurrence and poor prognosis.<sup>9</sup>

Mutations of Beta-catenin have been found in sporadic and recurrent Juvenile angiofibroma<sup>10</sup> X-Rays soft tissue neck lateral view showing radioluscent mass in nasopharynx and forward bowing of posterior wall of maxillary Sinus (hollman and miller sign) is an important sign of angiofibroma. Computerized tomograpahay and megnatic resonance imaging with contrast shows characteristic features of the angiofibroma which are almost diagnostic, so no need of biopsy confirmation.<sup>11</sup>

Several staging systems have been proposed but that of Fisch is the most common and practical.<sup>12</sup>

Fisch staging system of juvenile angiofibroma!

1. Tumor limited to the nasopharyngeal cavity; bone destruction negligible or limited to the sphenopalatine foramen
2. Tumor invading the pterygopalatine fossa or the maxillary, ethmoid or sphenoid sinus with bone destruction
3. Tumor invading the infratemporal fossa or orbital region
  - A. with out intracranial involvement
  - B. With intracranial extradural (parasellar) involvement
4. Intracranial intradural tumor:

- A. With out infiltration of the cavernous sinus, pituitary fossa or optic chiasma.
- B. With infiltration of the cavernous sinus, pituitary fossa or optic chiasma.

Diagnostic angiography is undertaken to evaluate the feeding vessel and as a prelude to selective embolization. Per operative profuse bleeding leads to incomplete removal of tumor and recurrence which in turn leads to increased morbidity and mortality.<sup>13</sup>

Surgical removal is the most accepted modality of treatment.<sup>14</sup> Various surgical approaches are used depending upon the location and extent of the tumor. Transpalatal approach is favoured for small tumors localized in the nasopharynx, while lateral rhinotomy is more popular for removing large tumors.<sup>15</sup> Now a days, Fisch type 1, 2 and 3 tumors are suitable for Endoscopic resection.<sup>16-18</sup> Advantages of Endoscopic endonasal techniques are reduced bleeding, few post operative complications and reduced length of hospital stay. We have removed nasopharyngeal angiofibroma by using sub labial midfacial degloving approach. By using exposure offered by this approach, the anterior, medial, lateral and posterior wall of the maxillary sinus are removed. This produces a large cavity that is confluent with the nasal cavity and post nasal space and gives adequate access for the tumor removal. Extension into inferior part of orbit and infratemporal fossa can also be removed.<sup>19</sup>

### Material and Method

This series consist of 15 cases of nasopharyngeal angiofibroma seen and diagnosed between July-2007 to July-2012. All were male and their ages between 11 to 20 years. All patients presented with nasal obstruction and nasal bleeding. CT scan with IV contrast was done in all cases. The tumors were staged according to fisch classification. All were managed surgically at the department of otorhinolaryngology and head and Neck surgery Unit-II, Services Hospital Lahore. 5cases were operated with out embolization and 5 cases with embolization of the feeding vessel. 5 cases were operated after temporary ligation of the external carotid artery.

### Technique of Embolization

Under local anaesthesia transfemoral route of catheterization was done, Diagnostic angiography was done first, delineating the external carotid arterial system. The catheter was advanced as close as possible to the tumor and angiogram was taken and then embolization was done with gelatin sponge

particles. An immediate post embolization angiogram is taken which demonstrated disappearance of the blush, showing effectiveness of the procedure.

### Surgical Technique

This was essentially a bilateral transnasal, transmaxillary approach. The procedure was carried out through a sublabial incision leaving no visible scar. With both infra-orbital nerves safeguarded, the midface was degloved subperiosteally up to the root of the nose. Sufficient access to the nasopharynx and infratemporal fossa was obtained by removing the medial, anterior, lateral and posterior walls of the maxillary sinus, so that the nasal cavity, maxillary antrum, nasopharynx, pterygopalatine and infratemporal fossa were converted into one cavity. The exposure to the parapharyngeal space was, however, limited.

### Results

All patients were male aged between 11-20 years. The average duration of surgery was 4 hours in non embolized patients while it was about 2.5 hours in embolized individuals. While it was about 3 hours in whom external carotid artery was ligated temporarily. The average blood loss in non embolized individuals was 2000 to 2500ml, in embolized individuals about 1000ml. It was about 800ml in patients in whom external carotid artery was temporarily ligated. Blood transfusion was given in all patients according to the blood loss. The follow-up period ranges from 6 months to 3 years. In two cases recurrence was observed which was managed by Endoscopic excision.

### Discussion

Nasopharyngeal Angiofibroma is a disease of young adolescent males. It presents with progressive nasal obstruction and repeated attacks of profuse bleeding without injury. Other symptoms depend upon extent of the disease, swelling of cheek, hearing loss secondary to eustachian tube obstruction, mucopurulent nasal discharge, hyposmia, snoring and plummy quality of voice. More extensive tumor causing invasion of orbit and cavernous sinus causes proptosis, diplopia, visual loss and headache. Surgical resection is the most accepted modality of treatment. Small size tumors located in the nasopharynx can be dealt with transpalatal approach and Endoscopic excision. Profuse intra operative bleeding leads to recurrence in 25 to 60% of cases. modality of treatment. Small size tumors located in the nasopharynx can be dealt with transpalatal

Approach and Endoscopic excision. Profuse intraoperative bleeding leads to reoccurrence in 25 to 60% of cases.

Severe intraoperative, haemorrhage can force the surgeon to abandon the procedure, leading to increased morbidity and mortality. Jawaid et al. reported a series, of 25 cases operated by transpalatal route extending the incision sublabially, for total excision of tumor extending to infratemporal fossa and cheek. Various methods have been adopted to reduce the morbidity and mortality of Nasopharyngeal Angiofibroma excision caused by intraoperative bleeding and subsequent multiple blood transfusions. This include preoperative chemotherapy with estrogen. But this not practiced widely due to feminizing effect in adolescent boys. Non steroidal androgen receptor blocker Flutamide is used, which causes, tumour shrinkage of upto 44%, reported by gates et al.<sup>21</sup> External carotid artery ligation is not popular as there are incidences reported of carotid rupture. Similarly hypotensive anaesthesia also reduces blood loss.

Several centres have reported results of external

beam radiotherapy for advanced disease, intracranial extension and recurrent disease (22, 23, 24). The dose of radiation is 30-35 Gy in several fractions. Lateral rhinotomy with upper lip split approach is practiced by majority of surgeons. This is a very good approach for tumors extending into pterygopalatine and infratemporal fossa. Ligation of internal maxillary artery can also be done preoperatively to control haemorrhage.

## Conclusion

Midfacial degloving approach: is a very excellent approach for removal of Nasopharyngeal Angiofibroma extending into the pterygopalatine and infratemporal fossa. There is less bleeding and also no facial scar.

Preoperative embolization reduces blood loss but cost effect is a major problem in our society. Preoperative external carotid artery ligation is useful in controlling perioperative haemorrhage.

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