ISSN 2250-3153

Endoscopic Endonasal Resection of Juvenile Nasopharyngeal Angiofibroma

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Abstract- Juvenile nasopharyngeal angiofibroma is a rare benign neoplasm that occurs in the nasopharynx particularly seen in young adolescent males. Surgery is the primary treatment of choice. Surgical approaches are either a standard open method or with the advent of endoscopes, recently it is endoscopic endonasal approach. With either of the approaches, it poses a great surgical challenge for the surgeons because of the vascular nature of the tumor and hence its risk for torrential bleed. Preoperative endovascular embolization has significantly reduced the risk of intraoperative bleeding and aids in tumor removal. However, embolization facilities are not available at all centres and embolization per se itself carries risk as high as 20 % leading to central artery occlusion, oroantral fistula due to tissue necrosis, occlusion of the middle cerebral artery followed by stroke and occlusion of ophthalmic artery. We present this article to share our experience of resection of juvenile nasopharyngeal angiofibroma using endoscopic endonasal approach without prior preoperative embolization and the importance of working around the periphery of the tumor with ligation of pedicle which helps in significant reduction of intraoperative bleed.

Index Terms- juvenile nasopharyngeal angiofibroma, embolisation, endoscopic approach.

I. INTRODUCTION

Juvenile nasopharyngeal angiofibroma (JNA) is a relatively rare, benign neoplasm of nasopharynx primarily affecting prepubertal and adolescent males (median age 15 years) classically presenting with unilateral nasal obstruction, epistaxis, and nasopharyngeal mass [1, 2]. They represent 0.05% to 0.5% of all head and neck tumors [1]. The propensity of this tumor for its torrential bleed and its ability to spread along the skull base and intracranial extension makes it a feared clinical entity. Surgery is the gold standard treatment of choice with other treatment modalities being complimentary.

II. CASE REPORT

A 15year old boy presented with persistent progressive nasal obstruction, snoring, mouth breathing, hyponasal speech and intermittent spontaneous epistaxis predominantly on the left side since 1 year.

Otorhinolaryngological examination revealed a deviated nasal septum (DNS) to the right with mucoid secretions in the left cavity. Nasal endoscopy showed a greyish lobulated fleshy mass obscuring both the choanae which bleeds on touch on the left nasal cavity. Computed Tomography study of Paranasal Sinus revealed well defined mass in left posterior nasal cavity and nasopharyngeal region with extension to the left pterygopalatine fossa expanding and eroding the ipsilateral pterygoid process with moderate enhancement on contrast administration consistent with juvenile nasopharyngeal angiofibroma. (Fig.1)

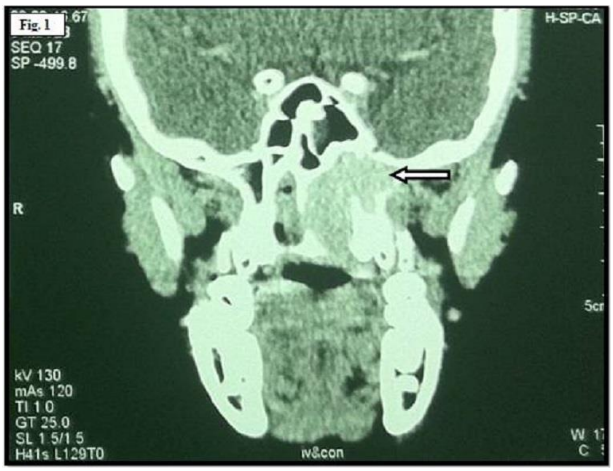

Figure 1: Computed tomography (contrast study) showing a well defined enhancing mass in the posterior nasal cavity and nasopharynx with extension to the left pterygopalatine fossa expanding and eroding the ipsilateral pterygoid process.

Arrow indicating well defined contrast enhanced mass in the nasopharynx and left pterygopalatine fossa.

Based on Fisch classification, it was a stage II tumor**.** Hence, the decision was made to approach this tumor through an endoscopic endonasal approach. Laboratory investigations revealed blood parameters within normal limits. His blood group being B positive, 3 units of cross matched blood were reserved.

A septal window was created for access using Killian's incision. Left middle meatal antrostomy, partial middle turbinectomy, complete ethmoidectomy and sphenoidotomy were done. Sphenopalatine foramen identified and sphenopalatine artery ligated. Posterior wall of maxillary sinus was removed and pterygopalatine fossa visualised. Dissection carried around the tumor subperiosteally. Vidian nerve, its canal and maxillary nerve visualized. Tumor delineated from the surrounding pterygopalatine fossa structures and removed by ligating the pedicle. Tumor pushed medially and its attachments to septum, margin of choanae, floor of sphenoid sinus were released submucosally and tumor was delivered in toto and sent for HPE.

The nasal cavity and sinuses were inspected and no active bleeding was observed. Bilateral nasal cavity was packed with merocel pack. The total amount of blood loss was around 350 ml. Post operative recovery of the patient was uneventful. Histopathological examination was consistent with juvenile nasopharyngeal angiofibroma. The patient is under regular follow up. Endoscopic examination and post operative CT scan after 6 months does not reveal any recurrence. (Fig. 2)

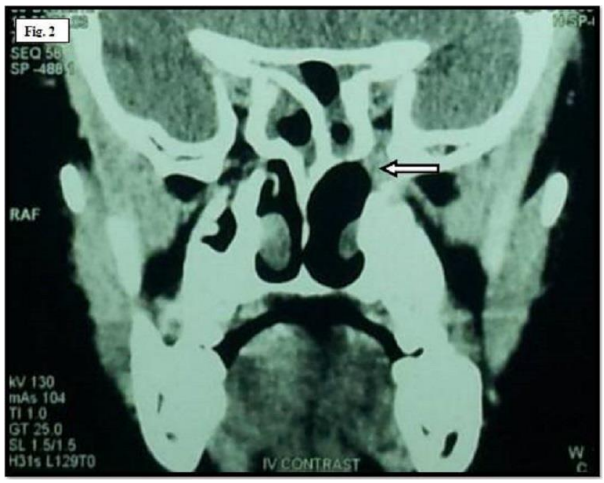

Figure 2: Post operative computed tomography scan (contrast study) showing nasopharynx and left pterygopalatine fossa free of mass.

Arrow showing nasopharynx and left pterygopalatine fossa free of mass.

III. DISCUSSION

The first description of this tumor was made by Hippocrates in 5th century BC. Friedberg was the first to call it angiofibroma in 1940 [3]. The tumor lacks a capsule and spreads submucosally and extends along natural foramina and fissures, not invading bone but often eroding it by pressure atrophy [2]. JNA arise in close proximity to the posterior attachment of middle turbinate, near the superior border of sphenopalatine foramen, and can extend anteriorly into the nasal cavity and septum, superiorly into the sphenoid sinus and laterally towards the pterygopalatine fossa. There are a variety of staging criteria for evaluating JNA which include Chandler, Radkowski, Fisch, Andrews, Onerci and Sessions et al. Transnasal biopsy is not indicated as it may provoke brisk hemorrhage. Imaging techniques such as CT and MRI are important tools of diagnosis, complement each other and help to define the extent of tumour. Selective arteriography with subtraction techniques will show the size, site of the lesion as well as the size and location of feeding vessels [4].

Surgery is the gold standard treatment for JNA. Other treatment options are nowadays occasional complimentary include chemotherapy, hormone administration, radiation therapy and embolization. Surgical techniques for JNA's include open surgical approach and endoscopic surgery or combined techniques depending on the stage of the tumor. Open surgical approaches are transpalatal, transantral, transnasal, lateral rhinotomy, midfacial degloving, and LeFort 1 osteotomy and infratemporal fossa approach. With the evolution of improvements in technique of endoscopic surgery assisted with better instrumentation and knowledge of intranasal anatomy, it is a viable alternative to open surgery.

For patients with JNA with tumor extension involving the nasopharynx, the nasal cavity, the pterygopalatine fossa, the transnasal endoscopic technique offers invasive resection of the entire tumor mass with minimal morphological disturbance [5]. Endoscopic surgery has great advantage because it preserves both the anatomy and physiology of the nose requiring less days of hospitalization, absence of visible scars and provides the possibility of obtaining a broad view of the lesion and its anatomic relationship with adjacent structures, enabling more accurate, complete dissection and better control of bleeding. It also avoids complications such as epiphora, dysesthesia, trismus, and craniofacial deformities [3]. The push pull technique which involves an incision of about one inch in the gingivo buccal sulcus is another evolution in endoscopic surgery for JNA [6, 7]. Endoscopic removal of JNA tumor appears to be safe and effective. Recurrence was not appreciably affected by approach [8].

Preoperative embolization reduces the occurrence of intraoperative bleeding and aids in visualization of the tumor and complete resection of larger tumours, but such a facility is not available in all centres. Complication of embolization rates may be as high as 20%, includes central retinal artery occlusion, oroantral fistula due to tissue necrosis, occlusion of the middle cerebral artery followed by stroke and occlusion of ophthalmic artery [1].

Use of radiotherapy for primary treatment for JNA has been described in recent publications. Other modalities of treatment such as antiandrogenic agents like flutamide and Gamma knife surgery (GKS) has been tried [9].

Inspite of technological and surgical advances, the recurrence rate have been reported between 30 and 50%, most occurring during the first 12 months after primary treatment.

ACKNOWLEDGEMENTS

We acknowledge the contribution of Dr B. Karpagam and Dr Srinivasa Mudali, Faculty of Radiology of our hospital for their valuable inputs in radiological interpretation of this patient.

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