ABSTRACT

Objectives: To evaluate the efficacy and outcome of maxillary swing approach in the management of extensive nasopharyngeal angiofibromas. Methods: A retrospective review of nasopharyngeal angiofibroma cases between 2010 and 2012 in a tertiary care center revealed five cases where maxillary swing approach was used to excise them. All patients had tumor extension to the lateral-most portions of the infratemporal fossa with complete occlusion and destruction of the lateral wall of the sphenoid sinus resulting in abutment to the cavernous sinus and complete involvement of the pterygopalatine fossa and pterygoid base. One patient displayed full occupancy of the maxillary sinus as a consequence of erosion of its posterior and medial walls while another resulted in severe temporal lobe compression because of its intracranial extension through the roof of the infratemporal fossa. Patients were followed up for a minimum period of 1 year after surgery. Results: The maxillary swing approach gave optimal exposure of the entire central skull base including the infratemporal fossa and its extreme lateral and superior aspects. Adequate tumor exposure and vascular control could be achieved in all cases resulting in complete tumor excision. The mean operative time was 3.1 h. Postoperative healing was satisfactory with a small palatal fistula formation in two cases and all patients remaining disease-free up to the present time. One had minimal misalignment of the halves of the upper jaw and two had epiphora, of which one required dacrocystorhinostomy. Conclusion: The maxillary swing is an effective approach in the management of extensive nasopharyngeal angiofibromas and leads to optimal anatomical exposure with minimal morbidity.

INTRODUCTION

Juvenile nasopharyngeal angiofibromas are rare, benign but highly vascular and locally destructive lesions seen almost exclusively in adolescent males. Extensive tumors with far lateral extension or intracranial extension along with involvement of vital cranial base structures can significantly increase morbidity and mortality. Surgical access in such tumors if often suboptimal, leading to residual disease and lack of adequate vascular control. Management of such tumors has always been controversial. Maxillary swing approach constitutes lateral swing of maxilla attached to cheek flap, and was initially designed for the management of post radiation nasopharyngeal carcinomas. The swing provides excellent exposure of the entire infratemporal fossa and central and lateral cranial base, from clivus to cervical vertebra, with acceptable morbidity and post-operative outcomes.

METHODS AND MATERIALS

Retrospective review of extensive Radoski stage III nasopharyngeal angiofibromas presenting at a tertiary referral centre who were operated using maxillary swing approach. Due to involvement of lateral most portion of infratemporal fossa and pterygoid root the midfacial degloving approach (our preferred approach in most of cases) was not a possibility. Informed consent was obtained from all patients before surgery. Pre-operative embolization of feeding vessels was done 48 hrs prior to surgery in three patients. Flutamide therapy for 4 weeks in a dose of 10 mg/kg/day was given to two patients where embolization could not be performed.

Operative technique

Webber-Ferguson-Longmire incision over ipsilateral hemiface, without sublabial extension was used in all. Minimal amount of bone was exposed for relevant osteotomies, leaving the cheek flap (supplied by facial artery) attached to the maxilla. Osteotomies were performed at palatal midline, frontal process of maxilla, maxillozygomatic suture, inferior orbital fissure and pterygoid process. Maxilla was swung laterally based on cheek flap with wide exposure of nasopharynx, infratemporal fossa and entire central cranial base. Tumor removal was followed by maxillary repositioning and fixation of the alveolar process using titanium miniplate and screws. Minimum follow up – 1 year Maximum follow up – 3.5 years.

RESULTS

All patients were adolescent males in an age range of 15–20 years without any prior history of surgery or radiotherapy. Most common presenting complaints were nasal obstruction and recurrent epistaxis, followed by proptosis, trismus and facial swelling. Table 1 shows the tumor extent in all five cases as seen on computed tomography and magnetic resonance imaging, pre-operative embolization records, operative blood loss and post-operative complications. In three cases, selective embolization of the feeding vessels was performed 48 h before surgery using gelfoam. The embolization procedure could not be performed in two cases, and both of them were administered flutamide under serum testosterone levels and liver function tests monitoring. One patient on flutamide therapy reported significant resolution of symptoms. No significant adverse effects were observed in either case except for mild temporary breast tenderness. Intra-operative tumor removal was complete in all cases with no remnants of disease. The exposure with maxillary swing was excellent in all the cases, enabling thorough inspection and assessment of the cranial base and infratemporal fossa and it provided adequate vascular control. Microsopic and telescopic assisted removal and drilling at different areas including vidian canal was possible in all cases. In four cases out of five, no difficulty was encountered in swinging the maxilla attached to the cheek flap. One patient had extension of the angiofibroma into the maxillary antrum, with its complete occupation destruction of medial and posterior walls. In this case, the hard palate and anterior wall of the maxilla were swung to expose the angiofibroma but the “swing” procedure was found to be technically more difficult in this case than in the others.

All patients had their vision preserved postoperatively and no one experienced any CSF leak. The cosmetic results were also good. The duration of surgery ranged from 2.6-4.5 hours with average of 3.1 h. The mean intra-operative blood loss was 1.5 liters. All patients required intra- and post-operative blood transfusions. Post-operative recovery was complicated by the formation of a small size palatal fistulas in two patients. One patient had spontaneous closure of the fistula by the 14th post-operative day whereas one required surgical closure under local anesthesia 2 months after surgery. Two patients developed epiphora with one patient requiring dacrocystorhinostomy. One patient had minimal but cosmetically acceptable mal-alignment of the upper incisors. During the minimum follow-up period of 1 year, no case showed any residual or recurrent lesion, as viewed on computed tomography or MRI.

Table 1:

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Extension</th>
<th>Vascularity</th>
<th>Embolization</th>
<th>Flutamide</th>
<th>Blood loss (l)</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 1</td>
<td>17</td>
<td>PR, O, TLC, CS, ITF, GWS, SS</td>
<td>ECA, ICA</td>
<td>-</td>
<td>+</td>
<td>1</td>
<td>Epiphora</td>
</tr>
<tr>
<td>Patient 2</td>
<td>15</td>
<td>PR, O, TLC, CS, ITF, GWS, SS</td>
<td>ECA</td>
<td>-</td>
<td>+</td>
<td>1.8</td>
<td>Small Palatal fistula</td>
</tr>
<tr>
<td>Patient 3</td>
<td>18</td>
<td>PR, PA, ITF, SS</td>
<td>ECA</td>
<td>-</td>
<td>-</td>
<td>2.1</td>
<td>Small Palatal fistula</td>
</tr>
<tr>
<td>Patient 4</td>
<td>16</td>
<td>PR, O, TLC, CS, ITF, GWS, SS</td>
<td>ECA</td>
<td>+</td>
<td>-</td>
<td>1.2</td>
<td>none</td>
</tr>
<tr>
<td>Patient 5</td>
<td>16</td>
<td>PR, ITF, GWS, SS</td>
<td>ECA</td>
<td>+</td>
<td>-</td>
<td>1.4</td>
<td>none</td>
</tr>
</tbody>
</table>

PR, pterygoid root; O, orbit; CS, cavernous sinus; ITF, infratemporal fossa; GWS, greater wing of sphenoid; SS, sphenoid sinus; TLC, temporal lobe compression; PA, petrous apex; ECA, external carotid artery; ICA, internal carotid artery.

CONCLUSIONS

The maxillary swing is an effective approach in the management of extensive nasopharyngeal angiofibromas that provides an optimal anatomical exposure of the central, anterior and antero-lateral cranial base, leading to their complete surgical excision. It gives acceptable cosmetic outcomes and minimal morbidity. The only limitation of this approach is that one cannot convert the once initiated midfacial degloving approach into it. Hence, these two approaches are mutually exclusive.

REFERENCES


N N Mathur, MS DNB FAMS; Ashish Vashisht, MS DNB
Department of Otolaryngology and Head & Neck Surgery, Vardhaman Mahavir Medical College and Safdarjang Hospital, New Delhi, India

Contact: N N Mathur
+91 9611109637
drnmathur@gmail.com