HOLLOW BULB OBTURATOR PROSTHESIS FOLLOWING TOTAL MAXILLECTOMY

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ABSTRACT

Rehabilitation of patient with malignant tumors in maxilla requires a multidisciplinary approach. Prosthodontic care, with maxillary obturator, of a patient with acquired maxillary defect provides comfort, function, aesthetics and minimal changes to the remaining compromised structures. An obturator is the maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate and/or contiguous alveolar/soft tissue structures. We are presenting a case who was rehabilitated with obturator following extended total maxillectomy for angiosarcoma of right maxilla.

Keywords: Maxillofacial prosthesis, Obturator, Rehabilitation

INTRODUCTION

Rehabilitation of patient with a malignant tumors in maxilla requires a multidisciplinary approach including surgical intervention, radiotherapy/ chemotherapy, prosthetic rehabilitation, speech therapy and physiotherapy.[1] Acceptable prosthodontic care for a patient with acquired maxillary defect should include cautious prosthesis designing, combined with routine maintenance and ample care to provide comfort, function, aesthetics and minimal changes to the remaining compromised structures.[2] Obturator is a maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate and/or contiguous alveolar/ soft tissue structures.[3] This prosthesis is used to restore masticatory function and improve speech, deglutition and cosmetics in patients.

CASE REPORT

A 20 years old female patient reported to the Department of ENT -HNS, PAHS, complaining of swelling in right maxillary region (Fig. Ia and Ib). The involved teeth expressed no pain or mobility. Clinical and radiographic examination was carried out. Incisional biopsy was sent for investigation. The histopathologic result revealed an Angiosarcoma involving right maxillary area. The patient was then referred to the prosthodontic unit for construction of an immediate surgical obturator.

The pre-operative impression was made using an irreversible hydrocolloid material (Zelgan 2002, Dentsply,USA) in a modified perforated

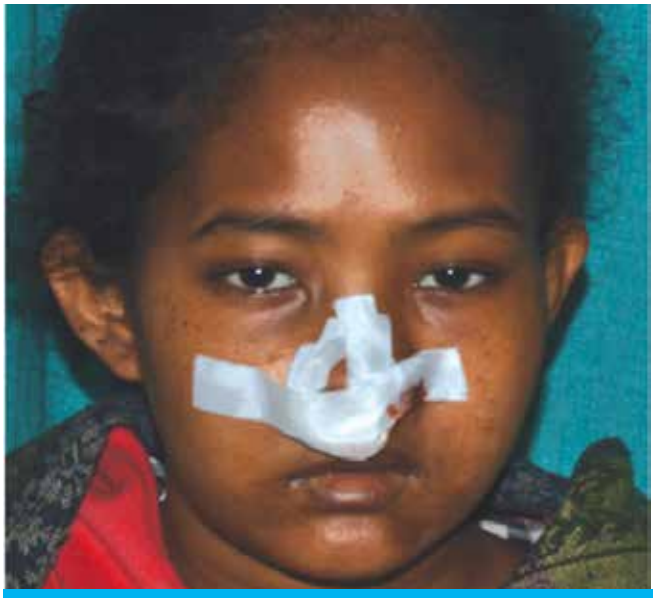

Fig.Ia: Extra-oral Preoperative view

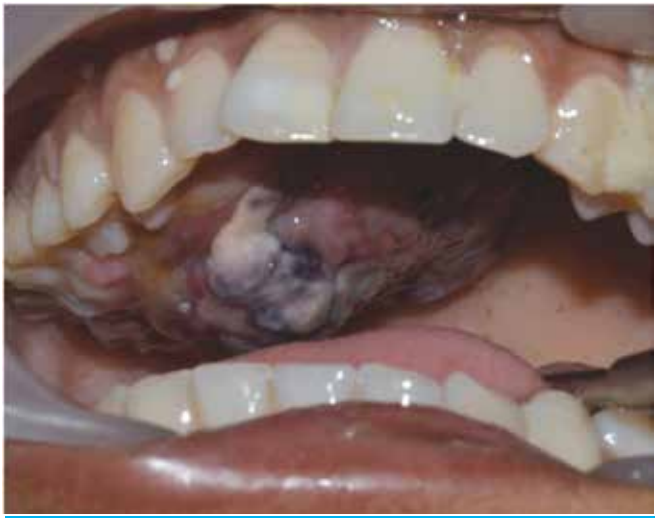

Fig. Ib: Intra-oral Preoperative view

stock tray. The impression was poured with dental stone (Gyproc, Prevest Denpro, Jammu, India) to produce the positive template/cast. The cast was sent to the surgeon to delineate area of resection, and an immediate surgical obturator was fabricated accordingly. In the operating room resection of the maxilla was done to remove the tumor. The immediate surgical obturator was inserted immediately following maxillary resection and was held in position using Adam's clasps on the remaining natural teeth (Fig. IIa and IIb).

Fig IIa: Intra oral view after surgery

Fig IIb: Intra oral view after insertion of immediate surgical obturator

After a week the patient was reviewed and proper position of the plate was ensured. The patient presented with a total maxillectomy defect extending from the left canine to the soft palate in the right side. Clinical intra-oral examination showed a large defect with an oro-nasal communication, while the remaining teeth (23-27), gingiva, and palate appeared within the normal limits. Extra-oral examination showed a curved profile, an asymmetrical face, no deviation of the mandible, no palpable or tender lymph nodes, and a normal TMJ. Radiographic examination revealed that the supporting bone of the remaining teeth was normal and so was the crown root ratio. The defect was classified as Aramany class I defect. The intra- and extra-oral examination revealed a good initial healing at the defect site. As our patient had a low financial status making it difficult for her to meet all treatment modalities like chemotherapy/radiotherapy but prosthodontic rehabilitation of maxillary acquired defects was planned into three stages of treatment with the help of dental laboratory and dental department. Then the fabrication of an interim obturator was initiated.

Impression with irreversible hydrocolloid material was made for fabrication of interim surgical obturator. After fabrication of cast, hollow bulb interim surgical obturator was fabricated using self cure acrylic (Fig. III).

Fig. III: Intra oral view after insertion of interim surgical obturator

Retention was obtained from the remaining teeth (23, 26 and 27) using wrought wire. Interim surgical obturator was inserted after 10 days. The instruction regarding the insertion, removal and oral hygiene maintenance was given to the patient. After a week tissue conditioning material was applied to improve the fit and to increase the patient's comfort (Fig. IV). Follow up appointments were scheduled in every 10-15 days for changing tissue conditioner for 6 months.

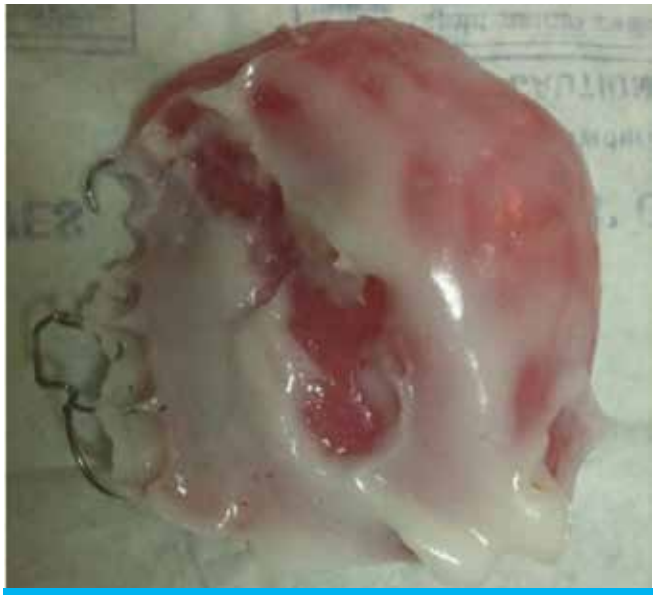

Fig. IV: Obturator relined with tissue conditioner

On six month follow up the patient presented with good intra-oral healing and improved oral hygiene (Fig. V), the construction of the definitive obturator was planned (a cast-metal removable dental prosthesis).

Irreversible hydrocolloid was used for primary

Fig. V: Intra oral view 3 months after surgery

impressions and the primary casts were obtained for definitive obturator. The maxillary cast was surveyed, the undercuts were observed and the necessary mouth preparations were done. The tripodal design was selected for the framework construction. The design included the rest seats on the left first premolar, first and second molars. Wrought wire clasp were planned for canines as per esthetic reason. A custom tray was fabricated on the primary cast with self-cure acrylic resin (Pyrax Rapid Cure, Pyrax Polymer, India). Green stick compound (DPI Pinnacle, Tracing Sticks, India) was used for border molding and the final impression was made using polyvinyl siloxane (Reprosil, Dentsply Caulk, USA) (Fig. VI). This was poured with dental stone type III to produce secondary working cast, which was then

Fig. VI: Final impression for definitive obturator

duplicated to produce the refractory cast, on which the wax up of the framework was performed. The framework was casted using cobalt–chromium alloy and was tried in the patient's mouth to evaluate the fit with the underlining structures. Centric jaw relation record was obtained and the casts were mounted on a semi-adjustable articulator (Hanau Wide Vue). Acrylic denture teeth (Cosmo HXl, Dentsply, Tianjin, China) were arranged and try-in was done to verify the occlusion with the mandibular teeth, aesthetic appearance, and support for the underlying tissues. Then, the prosthesis was processed, finished, and polished in the usual manner (Fig. VII a and b). After, processing hollow bulb was created by trimming the obturator, outer portion of hollow bulb was sealed with self cure acrylic (Fig. VIII).

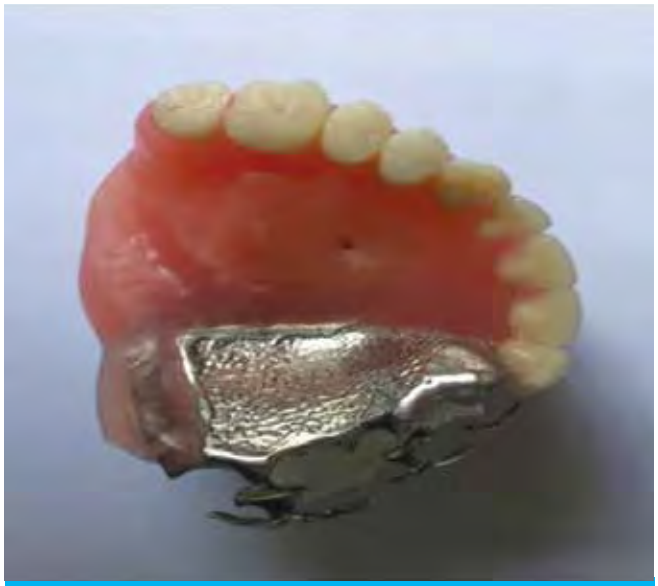

Fig. VII a: Processed Prosthesis

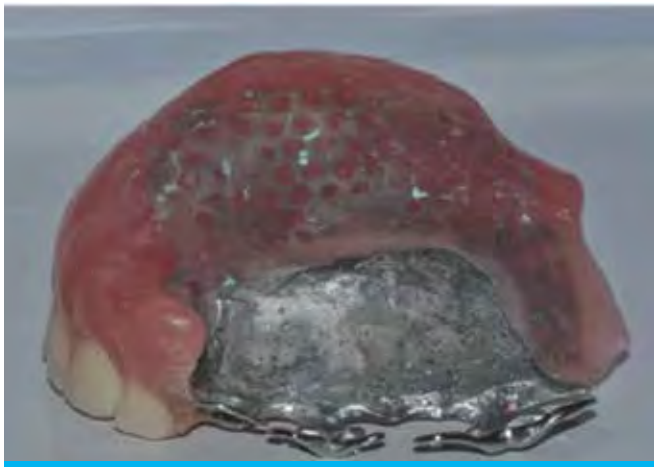

Fig. VII b: Processed Prosthesis

Fig. VIII: Hollow bulb created in processed Prosthesis

During insertion, the pressure indicator paste was used to inspect for any pressure areas. The denture was inserted (Fig. IX a, b and c) and post-insertion instructions were given to the patient in the care and use of the obturator. The patient was reviewed monthly for three months, and then the visits were arranged in every 3 months.

Fig IX a: Intra oral view of insertion of prosthesis

Fig IXb: Intra oral view in occlusion

Fig IXc: Extra oral view post operative

DISCUSSION

Angiosarcomas are malignant neoplasias with rapid growth potential that develop from endothelial cells. They present as a mass lesion with or without epistaxis and airway obstruction. Complete surgical excision is the treatment of choice especially with well delineated and solitary tumours. Radiotherapy and chemotherapy may be of benefit in multifocal, ill-defined tumors.[4]

Rehabilitation of patients with acquired maxillary defects is relatively simpler than rehabilitation of defects in the mandible, and pleasing as well as accepted outcomes can be identified at the end of treatment. On the other hand, great efforts should be given in dealing with large defects to

obtain the substantial requirements for retention and support of the prostheses.[5]

Immediate surgical obturator is a temporary maxillofacial prosthesis inserted during or immediately following surgical or traumatic loss of a portion or all of one or both maxillary bones and contiguous alveolar structures (i.e. gingival tissue, teeth).[3] No teeth were added and the retention was gained from the remaining teeth and sutures. Interim obturator is a maxillofacial prosthesis which is made following completion of initial healing following surgical resection of a portion or all of one or both maxillae; frequently many or all teeth in the defect area are replaced by this prosthesis. Interim prosthesis replaces the surgical obturator which is usually inserted at or immediately following the resection. Generally, an interim obturator is made to facilitate closure of the resultant defect after initial healing has been completed.[3] The patient should be seen every two weeks as the healing of the soft tissues in defect side exhibits more progress and lining materials can be placed.[6] In this case, fabrication of the interim obturator was performed 10 days after the surgery. Retention was gained from the remaining teeth by incorporating wrought wire clasps in the form of Adam's and C-clasps. Regular relining was performed with tissue conditioner.

Definitive obturator is a maxillofacial prosthesis that replaces part or all of the maxilla and associated teeth lost due to surgery or trauma.[3] Three to four months after surgery consideration may be given to the construction of definitive obturator prosthesis.[7] It is constructed from the postsurgical maxillary cast. This obturator consists of an artificial palate, ridge, teeth and closed hollow bulb. The timing will vary depending on the size of defect, progress of healing, prognosis for tumor control, effectiveness of present obturator, and presence or absence of teeth. Changes associated with healing and remodeling will continue to occur in the border areas of the defect for at least one year. Dimensional changes are primarily related to the peripheral soft tissues rather than to bony support areas.[7] In our case, a tripodal design was selected. Support was gained from the remaining teeth and palate. Rests were placed on the molars, first premolar, and canine. Full coverage of the remaining palate was decided to ensure maximum distribution of the functional load.

Rehabilitation of patients with maxillary defects using obturator prosthesis is an appropriate and noninvasive mean of treatment modality. Results support that good obturators contribute to a better life quality.[8]

CONCLUSION

Rehabilitation of patient with maxillary tumor is the multidisciplinary approach during and after the resection of the tumor. Prosthodontic care for this type of patient with maxillary obturator enhances comfort, function, and aesthetics to upgrade the lifestyle of patient with the maxillary defect.

'CONFLICTS OF INTEREST: NONE'

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