

CASE REPORT

Prosthetic Rehabilitation of A Unilateral Maxillary Defect with an Intermediate Obturator

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ABSTRACT:

Acquired maxillary defects resulting from surgical resection of tumors or trauma can lead to devastating effects on aesthetics, functional and psychological aspect of the patient. Prosthetic rehabilitation of such defect often possesses a great challenge and the goals are usually achieved by means of obturator prosthesis. Insertion of a large prosthetic appliance may not be well tolerated and accepted by many patients. Hence, a simple acrylic plate resembling a surgical obturator can be advocated in such patient as a training device which can be later converted to an intermediate/definite prosthesis. This is particularly helpful in patients who have a gagging tendency. This clinical report described fabrication of an intermediate obturator for rehabilitation of a maxillary defect (Aramany class II) to improve patient's phonetic, aesthetics, masticatory efficiency and deglutition.

Key words: Maxillary defects fg. cell carcinoma obturator, intermediate prosthesis.

Introduction

Malignant neoplasms of upper gingiva and hard palate nearly account for 1-5% of total occurrence in the oral cavity; two third of the lesions which involve these areas are squamous cell carcinomas.¹ Unfortunately they spread to adjacent structures, by the time they are diagnosed. The recommended treatment for these type of lesions are alveolectomy, palatectomy, partial/total maxillectomy, depending on the aggressiveness & location of the actual lesion, its histotype, patient's age and general health status. The post surgical effect usually has serious consequences as it disturbs both form and function

of normal stomatognathic system. Typically it results in hypernasal speech, regurgitation of food/fluid into nasal cavity, impaired mastication and deglutition. At times, it affects the facial contour of the patient, particularly when it involves one or both sides of maxilla with or without associated paranasal sinuses.

Rehabilitation of these acquired maxillary defects can be accomplished by using various type of micro-vascularised flap or by prosthetic means. Surgical reconstructions are usually considered when extensions of the defects are small. For larger defect, prosthetic rehabilitation seems to be a better alternative, since more risks are involved for survival of the graft. The prosthesis that is fabricated to repair the defect is called as a maxillary obturator. An

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obturator (Latin: obturare, to stop up) is a disc or plate, natural or artificial, which closes an opening or defect of the maxilla as a result of a *cleft palate or partial or total removal of maxilla* for a tumour mass.² Two primary objectives of maxillo-facial prosthodontists in carrying out rehabilitation is to restore the functions of mastication, deglutition, speech and to achieve normal oro-facial appearance.³ Depending upon the time period elapsed from surgical resection of maxilla, the obturator can be of three types: *the surgical obturator, the temporary or intermediate obturator and the definitive obturator*.⁴ In case of planned surgical resection of maxilla, the prosthetic rehabilitation can be executed properly which significantly reduces patient morbidity. However, many patients report at the clinic few days to few months following surgical resection of maxilla which has got a strong influence on overall prognosis of prosthetic rehabilitation. The later categories of patient either adapt lately or do not adapt easily to prosthetic treatment. To start with a simplified version of the obturator in the form of an acrylic plate and gradually converting it to make the intermediate/definite obturator can very often be helpful in relatively faster adaptation to such bigger prosthesis. This clinical report described a method for fabrication of a surgical plate turned into an intermediate hollow obturator following resection of left side maxilla, over a period time that allowed the patient to get accustomed to it favourably.

Case Work-up

A 33 year old woman reported to the Department of Prosthodontics with chief complaints of missing left upper teeth and a big defect in the roof of her mouth following surgery for tumour, 1½ months back. Apart from these, she was also concerned for frequent passage of food into nasal cavity, altered speech and difficulty in swallowing. Intra oral examination revealed a large triangular shaped maxillary defect (8×6cm) on the left palate barely crossing the midpalatine raphe (Aramany class II defect) and extending up to the soft palate with missing all maxillary left side teeth except the central incisor (Fig.1). She had been diagnosed with

squamous cell carcinoma of left maxilla for which she underwent surgical resection of the same with involvement of maxillary sinus and kept under supervision for recurrence of the lesion, if any. Mandibular arch was found to be with full component of teeth with a fair oral hygiene status. The remaining teeth were in good intercuspation. Extra oral findings were not very much significant except missing left side maxillary dentition which was evident due to functional movement of lips during speaking and smiling etc (Fig.2). During conversation with the patient, an obvious hyper nasal speech was noted.

As the healing of the defect was satisfactory, the case was deemed ideal for consideration for an intermediate obturator. After a detailed discussion, a heat-polymerizing acrylic resin maxillary obturator with hollow bulb design was planned and explained to the patient.

Prosthesis fabrication

The preliminary impression was made with Irreversible hydrocolloid (Zelgan2002; Dentsply India Pvt Ltd, Gurgaon, India) after careful blockage of severe tissue undercuts in the maxillary defect with the help of petrolatum laden moist gauge. The impression was disinfected with 2% glutaraldehyde and immediately poured with Type III Dental stone (Kalstone; Kala Bhai Pvt Ltd., Mumbai, India). During intra oral examination and impression making procedure, it was observed that the patient was having a severe gagging tendency. Though initially it was planned to make a single intermediate obturator with replacement of missing teeth, later on the plan was modified to make the prosthesis in a sequential manner owing to the gagging tendency and patient's initial hesitation to wear the prosthesis.

After finishing the cast, the defect area is completely blocked with Type II dental plaster (Kaldent; Kala Bhai Pvt Ltd., Mumbai, India) to level with the contour of remaining hard palate over the cast. Then softened modeling wax (Modeling wax; Dental Products of India, Mumbai, India) with an approximate thickness of 3mm was adopted over the

cast and the retentive clasps are added to the waxed up cast which was subsequently polymerized with heat cured acrylic resin (DPI-Heat cure; Dental Products of India, Mumbai, India) by wax elimination technique. The prosthesis, in the form of a simple plate without extending into the maxillary defect was properly finished, polished and inserted in patient's mouth (Fig.3). The patient was adequately instructed regarding use, home care of the prosthesis and kept under recall visit.

The patient gradually adapted to the prosthesis within 3wks when a second impression was made with addition poly vinyl siloxane impression material (Aquasil, Soft Putty/regular set, Dentsply, Germany) relined with medium body (Aquasil, Ultra monophase Dentsply, Germany). Then a second cast was made to fabricate the hollow bulb part of the obturator in the conventional manner. The hollow bulb was tried in the patient's mouth to relieve any pressure area and it was attached to the existing acrylic plate (Fig.4) with the help of self cured acrylic resin (DPI-RR; Dental Products of India, Mumbai, India) at chair side. The patient was encouraged to wear the prosthesis and again put under follow up visits. A noticeable improvement in intelligibility of speech was noted soon after insertion of the prosthesis.

One month later, the patient was found to maintain with the prosthesis satisfactorily. At the same visit jaw relation record was made followed by try-in and conversion of the same prosthesis into an intermediate obturator (DPI- Heat cure; Dental Products of India, Mumbai, India) with replacement of missing teeth (Fig.5) and minor modification in the retentive clasp design. After finishing, polishing, insertion of the obturator was done (Fig.6, 7 & 8) and the daily home care regime was re-emphasized. In this manner, effectively the rehabilitation could be achieved with a stepwise manner and efficiently maintained with a high level of patient satisfaction.

Discussion

Rehabilitation of acquired maxillary defects are always a tough task since the defects are usually

presented with varying degree of morphological forms which are highly individual in nature and the patients seek rehabilitation at different stages of treatment for a primary disease e.g. malignant tumour of maxilla. Hence, a common treatment approach seldom looks feasible while rehabilitating such patients. Very often the clinicians get puzzled as a great dilemma still exists whether to go for surgical or prosthetic rehabilitation. The basic advantages of surgical reconstruction are permanent closure of oro-nasal communication. But, the problem with this procedure are questionable prognosis of vascularised flap with autogenous bone graft particularly for very large defect, because the vessels of the free flap are compromised with partial necrosis in 1.8% patients.⁵ Other than this, patients need to be motivated for a second surgery and patients have to be convinced for another surgical wound at donor's site for the graft. The positive features of obturators include avoidance of any further surgery, allow the defect to keep under control in case of recurrence of primary disease, provision for replacement of teeth and can be planned at any time soon after surgical resection.

In the present case, rehabilitation with palatal obturator was preferred because the patient reported within 6wks following surgery, where at the defect site, though the wound healing was satisfactory, still there was some signs of inflammation which was not very much suitable for surgery. The patient's attitude for not going for a second surgery, size of the defect and chances of recurrence of primary lesion are few other considerations for prosthetic rehabilitation.

In literature, various materials have been used for fabrication of obturators. Silicone rubber⁶ and light polymerizing acrylic resin lack adequate strength.⁷ Heat polymerizing acrylic resin has been found to be one of the most durable and relatively tissue compatible materials which is still in use⁸ because of its ease of manipulation, superior hygiene, good colour stability etc. One of the most important

factors from retention and stability point of view is the hollow bulb design consideration of the prosthesis. It contributes to lightness of the obturator which further improves the cantilever mechanics of suspension, avoid over burdening of adjacent soft tissue⁸ and add resonance to speech.⁷ Fortunately, the mouth opening of the patient was adequate and she had good neuro-muscular control which allowed making a single obturator that is simple with regard to daily home care.

The obturator was fabricated with proper sequence owing to the patient's gagging tendency and the lack of motivation towards wearing a big prosthesis at the beginning. The purpose of making a simple acrylic plate initially was to allow sufficient time so that the patient's awareness of wearing a foreign object would decrease gradually with increasing time. Apart from this, it also served as a diagnostic aid to test patient's ability to manage with the obturator. Addition of hollow bulb and teeth to the existing maxillary plate avoided unnecessary adjustment of the plate and allowed the patient to adapt faster to the prosthesis.

REFERENCES

1. Tirelli G, Rizzo R, Biasotto M, Di Lenarda R, Argenti B, Gatto A, Bullo F. Obturator prostheses following palatal resection: clinical cases. *Acta Otorhinolaryngol Ital.* 2010 Feb; **30(1)**:33-39
2. Chalian VA, Drane JB, Standish SM. Maxillofacial prosthetics. Multidisciplinary practice. Baltimore (MD): Williams and Wilkins; 1971. p. 133-148
3. Beumer J, Curtis T, Firtell D. Maxillofacial rehabilitation: prosthodontic and surgical considerations. St. Louis: Mosby; 1979. p. 188-243
4. Wiens J.P. (1990) Acquired maxillofacial defects from motorvehicle accidents: Statistics and prosthodontic considerations. *Journal of Prosthetic Dentistry*, 63, 172
5. Cordeiro PG, Santamaria E. A classification system and algorithm for reconstruction of maxillectomy and midfacial defects. *Plast Reconstr Surg* 2000; **105**:2331-2346
6. Wood, RH, Carl W, Hollow silicone obturator for patients after total maxillectomy. *J. Prosthet Dent*, 1977; **47**: 643-651
7. Kumar NS. Prosthetic Rehabilitation of a Complete Bilateral Maxillectomy Patient: a Technical Report. *Australian Journal of Basic and Applied Sciences*, 2009; **3(2)**: 424-431
8. Brown KE, Clinical considerations in improving obturator treatment. *J Prosthet Dent*, 1970; **24**: 461-466.



Figure 1: Intra oral view of the maxillary defect (Aarmany Class II)



Figure 2: Frontal view of face following maxillectomy



Figure 3: Maxillary plate insertion



Figure 4: Maxillary plate with attached hollow bulb



Figure 5: Obturator with replaced teeth



Figure 6: Fabricated prosthesis in situ (Intra oral occlusal view)



Figure 7: Fabricated prosthesis in situ (Intra oral frontal view)



Figure 8: Fabricated prosthesis in situ (Extra oral view)