Radicular attachment assisted prosthetic rehabilitation of a patient with a unilateral maxillectomy defect secondary to adenocystic carcinoma

Clinical Report

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ABSTRACT

The rehabilitation of patients with acquired defects of the maxilla is a challenge in terms of re-establishing oronasal separation. In most patients these goals are met by means of prosthetic rehabilitation with an obturator prosthesis. Prosthetic rehabilitation can be achieved satisfactorily if all facets of treatment planning and design consideration are taken well into account prior to the rehabilitation process. In many cases effective obturation is achieved but in the relative majority, the prosthesis is usually rejected by the patient as being non-retentive and the outcome is a failure. So, making the prosthesis hollow and the placement of attachments can have a dramatic effect on the stability and retention of the obturator prosthesis in partially dentulous maxillectomy patients. This paper describes a clinical case of post maxillectomy due to adenocystic carcinoma, rehabilitated with the hollow bulb obturator stabilized with Dalla Bona type of radicular attachment.

KEY WORDS: Acquired maxillary defect, adenocystic carcinoma, hollow bulb obturator, radicular attachment

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INTRODUCTION

One percent of head and neck malignant neoplasms and 10% of salivary gland neoplasms are adenocystic carcinoma.[1] Adenocystic carcinoma commonly affects the minor salivary glands. Fifty percent of all oral cavity adenocystic carcinomas occur on the palate.[2] The traditional school of thought is that minor salivary gland tumors have the worst prognosis. This is because it is easier for the tumor to infiltrate outside the gland and then invade surrounding tissues, which is why it requires an aggressive combination of complete and adequate surgical excision with radiation therapy to yield optimal local regional control rates.[3]

Defects of the maxilla may results from trauma, disease, pathological changes, or follow surgical resection of oral neoplasms. Maxillectomy defects result in the formation of an opening between the oral cavity and the antrum and/or the nasopharynx. This inevitably results in problems with speech, mastication, swallowing and impaired facial esthetics. Rehabilitation is important as such functional impairments have a detrimental effect on the quality of life and self-esteem.[4-6] A well-retained user-friendly, removable maxillofacial prosthesis is the key to successful prosthetic rehabilitation in such cases.[5] In dentate patients support, stability and retention of an obturating removable prosthesis relies on the remaining hard and soft tissues.[7] The larger the surgical resection, the greater the loss of the mucogingival support, which in turn results in increased unfavorable forces acting on the remaining abutment teeth.[8,9]

Since the advent of radicular attachments, the combination of Dalla Bona type of ball and socket

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attachment and prosthetic obturator seems to be beneficial, especially in the rehabilitation of partially edentulous maxillectomy patients. A Dalla Bona type of radicular attachments is readily available, easy to use and also very economical. This clinical report demonstrates the use of radicular attachment to improve stability and retention of the obturator prosthesis.

CLINICAL REPORT

A 52-year-old male patient presented to the prosthodontic department of Sri Ramachandra Dental College and Research Institute, Chennai for replacement of his existing obturator. The patient's medical history revealed that he was diagnosed as having pleomorphic adenoma 23 years back and surgery was performed for this. It was followed by frequent recurrence and surgeries. Later, the patient was diagnosed as having adenocystic carcinoma, 19 years back and underwent radical resection as well as radiation therapy. Later, the defect was obturated with the help of a prosthetic obturator.

The intra-oral examination revealed a total maxillectomy of the left side and a partially dentulous maxilla on the right [Figure 1]. The presented defect situation corresponded to a Class I situation (resection performed along the palatal midline) according to the Aramany classification of defects.[8] All walls of the defect were lined with healthy mucosal graft. The mandibular arch was fully dentate. Mandibular movements were within the normal range, with no evidence of supra- eruption of mandibular teeth. Tongue function was normal, and speech was altered without the obturator and considered fair with the prosthesis in place. The patient indicated that the prosthesis was not retentive and stable. He was also not satisfied with esthetics. The dental condition of the remaining partial maxilla was not satisfactory and the first molar was root canal treated. Teeth present in maxilla were 11, 12, 13, 16 and 18. On examination it was found that the prosthesis was an interim obturator, not a definitive obturator [Figure 2].

Treatment plan

For this patient, there was no alternative to prosthetic obturation with a definitive obturator. Considering stability, retention, load distribution and supra structure longevity, the decision was made to rehabilitate the patient with a hollow bulb obturator with the cast metal framework. As per design principles given by Aramany in 1978 for Class I maxillectomy defect, direct retention was obtained from the labial surface of central incisor with the help of I-bar and posterior retention was gained from the buccal surface of the last molar, and bracing was done palatally.[9] According to Aramany, prosthesis design can be either linear or tripoidal. Since the tripoidal design was more favorable to provide retention, stability and support of a new obturator, the placement of Dalla Bona resilient type of ball and socket radicular attachment was planned in relation to the first molar which was root canal treated.

Procedure

1. After the required intra-oral examination, preparation of mesial rest seat on 18 was done for a cast metal framework.
2. A complete arch impression was then taken using polyvinyl siloxane silicone impression material.
3. A cast metal framework was fabricated and checked intra-orally for retention and fit. Care was taken to provide relief in the right molar region.
4. The framework was used to make a functional impression of the defect using polyvinyl siloxane silicone impression material of putty consistency first, followed by an impression with light body.
5. With the conventional method jaw relation and teeth arrangement were done.
6. Processing was done to obtain a hollow bulb obturator and inserted in the patient's mouth to check adaptability [Figures 3 and 4].
7. Once the obturator was inserted properly and checked for adaptability, placement of radicular attachment was considered.
8. The palatal root of the first molar was selected for placement of the attachment. Preparation for radicular attachment is similar to that for a post space. Gutta percha was removed with the help of Gates and Peazo reamers. Care was taken to maintain apical seal of Gutta percha.
9. After this the male component of the attachment was checked for its fit in the prepared palatal canal. When the fit was found satisfactory, the male component was cemented using GIC luting cement [Figures 5 and 7].
10. After cementation, the location of the male component was transferred to the final prosthesis for fixation of the female component with the help of indicator paste.
11. The prosthesis was fully relieved at that point. The female component was attached to the male part and fixed to final prosthesis with the help of auto polymerizing resin intra-orally.
12. The prosthesis was then removed and the position of the component was rechecked. The prosthesis was finished and polished [Figure 6].
13. The patient was given training and all post insertion instructions for maintenance.
14. The post insertion follow-up and patient care were carried out at the prescribed intervals of time, which revealed that the patient was thoroughly satisfied and extremely comfortable with the functioning and esthetics of the prosthesis [Figures 8-10]. There were no complications such

as looseness of attachment components and inflammation. Topical fluoride application was done on the remaining exposed tooth structure of 16. Excellent oral hygiene was maintained, and the patient was instructed and repeatedly urged to use an electric toothbrush and floss the head of the male component.

DISCUSSION

Prosthetic obturation was the treatment of the choice for this patient. Recent investigations have confirmed the effectiveness of an obturator prosthesis in terms of speech, masticatory function, swallowing and appearance,[10] especially for small defects.[11]

Figure 1: Intra-oral view of defect

Figure 2: Patient's old prosthesis

Figure 3: New prosthesis occlusal view

Figure 4: New prosthesis palatal view

Figure 5: Male component

Figure 6: Female component

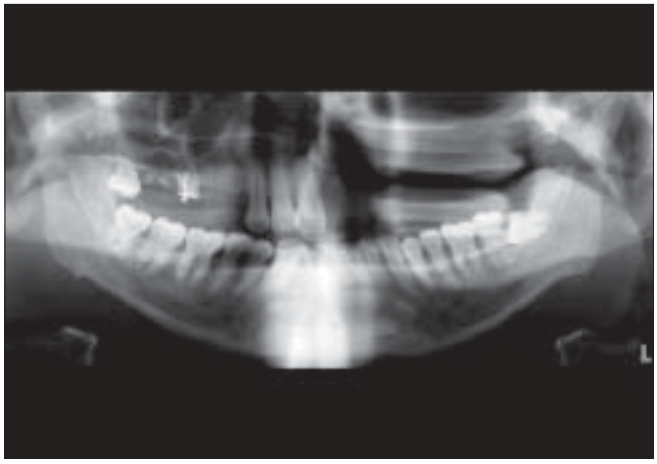

Figure 7: OPG showing attachment at place

Figure 8: Defect obturated

Figure 9: Patient without prosthesis

Figure 10: Patient with prosthesis

There is evidence that speech can be restored to a pre-operative level with the maxillary obturator prosthesis.[4]

The presented defect situation corresponds to a Class I situation according to Aramany classification of defects.[8] Loading of the defect portion of the conventional obturator prosthesis would have induced considerable non-axial forces on the anchoring dentition. Through the placement of radicular attachment, a more favorable triangular support was achieved and leverage was reduced for the teeth adjacent to the defect. This report describes a technique to manage an acquired hard palate defect and a simplified and effective protocol was followed to illustrate the procedure to increase retention and stability of the prosthesis.

Radicular attachments are proved to be effective in various clinical conditions to rehabilitate patients with partial edentulism. It is an easily available, cost effective and easy to master technique to increase adaptability of the prosthesis for our patients.

CONCLUSION

Prosthetic rehabilitation of the dentate maxillectomy patient is a lengthy and involved process. However, if attention is paid to the proper sequencing and details of treatment, it can be one of the most satisfying procedures.[12] And one of the most frequent complaints is of loss of retention of the prosthesis, which can be rectified by the placement of attachment; and radicular attachments seem to be a boon for maxillofacial prosthodontists to rehabilitate their patients and give the patient an opportunity to live life as close to normal as possible.

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