IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 19, Issue 5 Ser.3 (May. 2020), PP 45-49
www.iosrjournals.org

Hollow Denture Prosthetic Option for Ameloblastoma Treated Patients - A Case Report

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Abstract:*Severe loss of mandibular ridge is not common in the removal of Ameloblastoma. Its rehabilitation becomes a challenge for the prosthodontist. This has made prosthodontist to look for modifications in the conventional prosthetic forms to gratify patients' expectations who have difficulty in wearing the mandibular dentures. The best treatment method requires balancing between the stability, retention, and support to the fullest. This case report describes the prosthetic rehabilitation of a patient with hollow denture who was treated for ameloblastoma. Due to its reduced excessive acrylic resin weight, the hollow denture efficaciously replaces the lost voluminous alveolar ridge in the increased interridge space of the denture wearer.*
Key Word*: Ameloblastoma;Hollow denture; Denture retention.*

Date of Submission: 27-04-2020 Date of Acceptance: 10-05-2020

I. Introduction

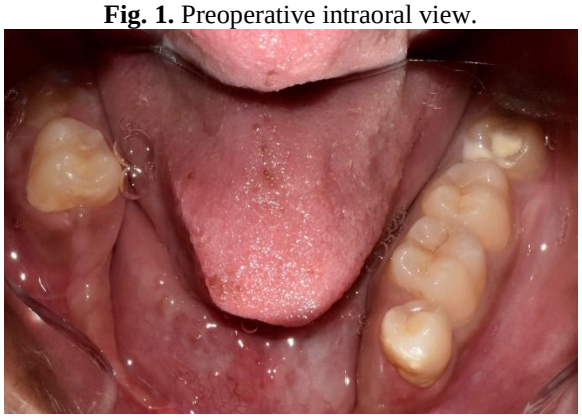
Ameloblastoma is a common and benign odontogenic epithelial tumour. But it has an aggressive behavior and recurrent course and is not commonly metastatic. Among all the tumours and cysts that affects the maxillomandibular area, Ameloblastomas are almost 1% and in case of the odontogenic tumours it is about 10%. It is mainly seen in adults in the third to fifth decade of life, with equal male to female ratio. Radiographically, it is often found as an expansile radiolucent lesion, with thinned and perforated cortices and is known to cause root resorption. As the radiographic features are common with other lesions like Giant cell tumour, Aneurysmal bone cyst, and Renal cell carcinoma, a definitive diagnosis can only be made with histopathology.[1] Its common site of occurrence is the mandibular molar region. More than 50% of recurrence appears with in the first five years after surgery. Although Ameloblastomas are well studied and documented, its malignant features are less explored.[2]Conventional Ameloblastoma have a slow grow rate but are locally invasive and can be highly damaging to the surrounding dental anatomy. Aggressive resection is the best method of eliminating the tumours, but treatment can further contribute to patient deformity and malfunction.[3]This may contribute to serious complications like facial deformity, oronasal and oroantral communication, phonetic difficulties, problems with swallowing, loss of teeth and alveolar basal processes which leads to serious chewing problems.[4] The rehabilitation of such patients are big challenges to prosthodontists as well as to the laboratory personnel.

II. Case report

A 19-year-old male patient was suffering from a unicystic mural ameloblastoma. The tumour was located anterioposteriorly in the mandibular region encompassing 10 teeth, specifically the central incisor, lateral incisor, canine and premolars. Excision of the lesion was carried out after marginal resection of the mandible. There was no immediate placement of graft in this patient. All the 10 teeth were removed along with the tumour.

The patient was referred to the Department of Prosthodontics, Govt Dental College Trivandrum, for the replacement of missing teeth. Intra oral examination revealed missing 31,32,33,34,41,42,43,44,45,46. There was complete obliteration of the labial vestibule in the defect site and a reduction in the mesiodistal space in the mandibular arch after surgery (Fig.1).

Fig. 1. Preoperative intraoral view.



The treatment plan was formulated after taking into consideration the two main challenges namely, the lack of adequate ridge affecting retention of the prosthesis and the financial constraints of the patient. Hollow conventional acrylic removable partial denture was selected to overcome both these issues which resulted in the successful rehabilitation of the patient.

III. Treatment procedure

The Primary impression was made using irreversible hydrocolloid impression material (DPI). It was difficult to get a proper impression using the normal tray due to the low ridge. To overcome this, the depth of the tray was adjusted using modelling wax in the area of low ridge, and the tray was then loaded with impression material. The impression was poured using Type III dental stone (GYPROCK). Jaw relation was recorded with modelling wax (HINDUSTHAN-NO.2). The cast was mounted on the articulator, and the correct shade was selected for the denture teeth to get a natural look and better aesthetics. Once these processes were finished a 'Try in' was done for checking the compatibility and accuracy of the trial denture (Fig.2). It was then was invested, and dewaxed and packed to obtain the definitive prosthesis. (Fig.3).

Fig. 2. Trial done.

Fig. 3. Dewaxing done; Two horizontal grooves made on base of flask.

For making the denture hollow below steps were used.

a. Two horizontal grooves were made in the base of the flask across the ridge for the orientation of putty material. (Fig.3)
b. Then wax of 1 mm thickness was adapted on the both base and counter flask. (Fig.4A, 4B)
c. Small amount of Putty material was packed in between the wax and a 19 gauge wire was placed through the putty material into the horizontal groove for orientation of the putty material. Then flask was closed under pressure. (Fig.5)
d. After setting of putty material, flask was opened, wax removed, and Putty material was retrieved.
e. Irreversible hydrocolloid impression of the putty material was made and the replica of the same was made in soap. (Fig.6)
f. Then trial closure was done with putty material.
g. After that flask was opened and soap replica was placed in the space made with putty. Flask was closed under pressure.

Once the curing was done, the prosthesis was retrieved, and denture was finished, and the prosthesis was immersed in water to check the lightness (Fig.7). Definitive prosthesis was tried in the patient's mouth. (Fig.8).

Fig. 4A. Wax of 1mm thickness was adapted on base flask.

Fig. 4B. Wax of 1mm thickness was adapted on counter flask.

Fig. 5. Putty material was packed in between wax and 19-gauge wire was placed through putty material into horizontal groove.

Fig. 6. Replica of putty material was made in soap.

Fig. 7. Prosthesis was immersed in water to check lightness of denture.

Fig. 8. Postoperative intra oral view.

IV. Discussion

Ameloblastoma is a locally invasive nonmalignant tumour that is commonly seen in the mandible. It results in painless expansion of the mandible along with displacement of teeth. The most popular treatment option for patients with ameloblastoma is resection of the mandible.[5]

Eckardt et al[6] reported that 26% of Ameloblastomas seen are recurrences. Patients were observed from six weeks postoperative to five years. The recurrences were observed two and four years after treatment. Műller and slootweg found that most occurrences of recurrent ameloblastoma are seen within five years of therapy.[7]

The ultimate goal of treatment of ameloblastoma is restoration of function and aesthetics.[8] For this patient, there was loss of many teeth and reduced mesio distal space and complete obliteration of labial vestibule in the defect site, with very less amount of mandibular ridge was sighted. So, retention expected for the denture was less. Severe loss in the residual alveolar ridges has long been a clinical challenge in prosthodontic rehabilitations. Pain, mucosal irritation to loading, difficulties with eating and speech, loss of soft tissue support, change in facial appearance etc. are usual problems faced by the patients. In addition, a severely resorbed mandibular ridge will have a more constricted residual ridge, decreased supporting tissue bed and a resultant large restorative interridge space. The denture usually put back more bone than teeth to restore the proper dimensions of the face.[9]

Whether the weight of the denture should be heavy or light continues be a discussion among notable authors with convincing literary justifications for both the types.[10] Grunewald AH in his study concluded that the gold denture bases used, which are heavier, functioned both as an efficiently adapted denture base to the underlying tissue bed (stability), together with a sound retentive quality.[11] This conclusion was supported by Wormley JH et al., who further went on with explaining the benefits of weighted dentures, apart from offering the advantages of a cast metal base, namely the additional ease of adjustment and relining.[12,13] 'Weighted' mandibular denture was thus a suggested treatment method for the management of severely resorbed ridges, as it provides both the retention and stability of mandibular prosthesis, aided by force of gravity.[14]

However, around that time, some other studies also came up with the idea which promoted the thought that by improving the fit of the denture base, instead of adding up a few extra ounces for supplementing the stability of the dentures, resoundingly equal stability can be achieved. Ohkubo C and Hosoi T[15] conducted a study in which he established that the mandibular denture retention or stability cannot be enhanced by increasing weight. Some studies went further in criticising the extra weight and claimed it is not benefitting the prosthesis, and may accelerate resorption of the residual ridges due to its continuous pressure being applied upon the residual ridge, even at rest.[14,16,17,18,19] These studies served as the leading light in development of methods that maintain volume of denture base without increasing the weight factor, by "hollowing out" the denture base. Patients with severe residual ridge resorption require an extensive volume for the denture base in prosthesis, but a lower weight in such prosthesis can be achieved by making the denture bases hollow.

Hollow mandibular acrylic removable partial denture was planned which will provide more retention and reduces the weight of the prosthesis considerably, which in turn prevents transmission of detrimental forces to the residual alveolar ridge and prevents trauma.

V. Conclusion

Ameloblastoma even though benign, is very aggressive and leaves the patients who present late with large defect which require extensive reconstruction. Lower financial strength also prevents patients from coming for reconstruction. Such patients can be rehabilitated functionally and aesthetically with hollow conventional acrylic removable partial denture. The treatment procedure was completed successfully, and the patient was satisfied both in terms of fit and finish as well as the cost effectiveness.

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Dr. Shari.S.R,etal. "Hollow Denture Prosthetic Option for Ameloblastoma Treated Patients - A Case Report." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 19(3), 2020, pp. 45-49.