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Giant Cell Reparative Granuloma: Prosthodontic Management

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Abstract: Defects in the maxillary jaw may entail oral cavity and the related anatomic structures and can be congenital, developmental, acquired, traumatic or surgical in origin. Giant cell reparative granuloma is one such lesion affecting jaw which accounts for 1–7% of all benign lesions of the jaw. The surgical resection of these lesions may result in the loss of some or all of the soft and / or hard palate resulting in insufficient structure or altered function of the remaining tissues. And these defects may affect the articulation and airflow during speech production and also nasal reflux during deglutition. Surgical resection also results in altered anatomy due to scarring, tissue contracture, lack of bony support and tissue edema. Such patients may face the problems of regurgitation of water and food through nose and difficulty in speech. This case report describes prosthodontic management of the pre and post surgical treatment of giant cell reparative granuloma by using surgical and definitive obturators respectively.

Keywords: Definitive obturator, Giant cell reparative granuloma, Maxillary defects, Maxillofacial prosthesis, Partial maxillectomy, Surgical obturator.

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Introduction:

Maxillofacial prosthodontics is the art and science of functional, or cosmetic restoration for those regions in the maxilla, mandible, and face that are missing or defective because of surgical intervention, trauma, pathology, developmental or congenital malformation by means of non living substitutes.¹ It's our duty as a prosthodontist to help such people, as it is the God given right of every human being to appear human.² Openings into the antrum and nasopharynx are the most common intraoral defects in the maxilla and they can be congenital, developmental, acquired, traumatic, or surgical involving the oral cavity and the related anatomic structures.³ Giant cell reparative granuloma, introduced into medical literature by Jaffe in 1953⁴ is one such lesion affecting jaw which accounts for 1–7% of all benign lesions of the jaw. Reparative giant cell granuloma (RGCG) is not a true neoplasm and is a reactive process which can be triggered by trauma or inflammation. It is a nonodontogenic lesion which is rare in the head and neck region and never seen in any other bone of the skeleton. It predominantly affects maxilla followed by the mandible and often seen in children and young adults, more commonly females, in the second and third decades of life. RGCGs are classified, as central (bone) and peripheral (gingival tissues) according to location. The clinical importance of this benign tumor is that they clinically mimic a malignant lesion.⁵ The surgical intervention of these lesions may result in the absence or loss of some or all of the soft palate and/or hard palate resulting in insufficient structure or altered function of the remaining structure. They also interfere with the articulation and airflow during speech production and nasal reflux during deglutition. Nasal sounds such as “n,” “m,” and “ng” are often present due to the absence of closure of the pharyngeal wall. Patients after surgical resection present with altered anatomy due to scarring, tissue contracture, lack of bony support, and tissue edema. Restricted opening of the jaws and altered range of mandibular movements with fibrosis and trismus are also frequently seen. These patients have the problem of regurgitation of water and food through nose. To prevent these problems and to help the patient in deglutition and speech, defects must be restored with prosthesis.³ Maxillofacial prosthesis is any prosthesis used to replace part or all of any stomatognathic and / or craniofacial structures.⁶ In this situation, a prosthesis called, an obturator (Latin: Obturate, means to close or shut off)³ is designed to close the opening between the residual hard and/ or soft palate and pharynx, thereby facilitating speech, deglutition, improved articulation and mastication and reduced nasal regurgitation and hypernasal speech. The present report illustrates prosthodontic management of a patient who reported with giant cell reparative granuloma.

Case report:

A patient named Mrs. Kamla Kunwar, 43 years old female referred to the department of Prosthodontics for the fabrication of surgical obturator with the chief complaint of swelling over the right side of the face. Reports of histopathological, radiological and blood investigations revealed the swelling to be

giant cell reparative granuloma of bone, which is present since 15 days with pain on opening and closing of mouth. Extra oral examination (Figure: 1) revealed swelling extending from the right corner of the mouth to the temporal region. Intra oral examination (Figure: 2a) revealed swelling covering the alveolar ridge, hard palate extending up to the midline on the right side of maxilla obliterating the vestibule and root stump with respect to 37 was also present (Figure: 2b). The prosthetic treatment options which were given to the patient includes, following the surgical resection of giant cell reparative granuloma, placement of immediate surgical obturator, placement of interim obturator after 1 month of surgery and placement of definitive obturator after 3-4 months of surgery and extraction of root stump with respect to 37 and fabrication of fixed partial denture with respect to 36-38. Patient was not willing for extraction of rootstump with respect to 37 and desired only the treatment for post surgical defect. Prosthetic treatment planned was fabrication of surgical and definitive obturator since patient was not willing for interim obturator.

Fabrication of surgical obturator:

Primary impressions (Figure: 3a & 3b) were made with respect to maxillary and mandibular arch using alginate (Zelgan, Dentsply, Gurgaon, India) and primary casts were obtained (Figure: 4a & 4b). After consulting the oral and maxillofacial surgeon and obtaining the outline of the surgical extension on the primary cast, arbitrary scraping of the proposed surgical site was done (Figure: 5). This was done at the region of lesion where the future surgical obturator may occupy followed by the surgical intervention and the undercuts were blocked. Retentive components of the obturator, C clasp and double Adams clasp were fabricated for adequate retention of the prosthesis and adapted on the cast (Figure: 6a & 6b) following which the surgical obturator was fabricated (Figure: 7a & 7b) by using clear self cure acrylic resin (DPI, Rapid repair, cold cure, Uttarakhand, India). The surgical obturator was not having any artificial teeth.

After a thorough disinfection, the immediate placement of the surgical obturator was done following the surgical removal of the lesion (Figure: 8 & 9). The defect represented the classic maxillary resection defect which falls under Army's class I classification, where the hard palate, alveolar ridge, and dentition are removed up to the midline.⁷ Post placement instructions were given. Patient reported after 3 months. Adequate healing of the defect was observed. After a thorough irrigation primary impression was made with respect maxillary arch using alginate (Figure: 10) (Zelgan, Dentsply, Gurgaon, India). Primary cast was obtained (Figure: 11) and custom tray was fabricated with an impression compound handle attached (Figure: 12). Border molding was done using low fusing impression compound (DPI pinnacle, Uttarakhand, India) and final impression was made using heavy body elastomeric impression material (Aquasil ultra heavy, Dentsply caulk, USA) (Figure: 13). Final impression was disinfected, master cast was poured (Figure: 14). Unfavorable undercuts are blocked out, denture base and occlusal rim was

fabricated. Maxillomandibular relationship was established and recorded. Teeth arrangement was done (Figure: 15) and try in of waxed up denture was done (Figure: 16). Trial denture has been checked and verified for the quality, phonetics, esthetics and previously established maxillomandibular relationship. Patient opinion was also obtained. Investing and acrylization of the waxed up denture were done using heat cure acrylic resin (Trevalon, Dentsply, Gurgaon, India). Figure 17a & 17 b shows the final finished and polished definitive obturator. Placement of definitive obturator (Figure: 18a & 18b) was done and post insertion instructions were given. Patient was recalled after 1 month, 3 months and 6 months for follow up and showed improved oral cavity functions and reported that swallowing and mastication were restored with the use of definitive obturator.

Discussion: Obturators are maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate and/ or contiguous alveolar/ soft tissue structures.⁸ The obturators which are made before surgery and inserted in the operating room at the time of surgery are the immediate surgical obturators (ISO). Different materials are used for the fabrication of surgical obturators which includes sponges, gutta-percha, inflatable bulbs, and acrylic resin prosthesis.⁹ Chemically activated clear acrylic resin was preferred in this case report as it allows easy visualization of extensions and possible pressure areas at surgery. The surgical obturator was fabricated like a record base, without replacing any teeth and by the incorporation of retentive components such as the 'C' clasp and the 'double adams clasp'. The surgical obturator acts as an artificial palate, ensuring restoration of oral function, especially speech and deglutition. The use of surgical obturators in patients undergoing maxillectomy procedures helps the patient to adjust both physiologically and psychologically following the operation, and also makes the patient more optimistic about future rehabilitation.¹⁰

Definitive obturators are fabricated after the complete healing of the surgical site. In the present case after the resection of the lesion, the defect fell under the Armany's Class I situation where Class 1 represents the classic maxillary resection defect where the hard palate, alveolar ridge, and dentition are removed to the midline. This unilateral defect is the one most commonly seen in rehabilitative practice (Figure: 19).⁷ Wu and Schaaf in 1989 showed that hollowing the obturator for partial maxillectomy patients decreases the weight of the obturator from 33.06% to 6.55% depending on the size of the defect.¹¹ Pankaj et al., in the year 2014 published an article on maxillary obturator prosthesis rehabilitation: Case series of three patients, in which patients were treated with surgical, interim and definitive obturator prostheses and the patients showed improvement in speech and mastication following prosthesis placement.¹² Dentulous patients with a sound distribution of dentition and favorable defects of the hard palate can be effectively restored with an RPD-obturator prosthesis. To facilitate retention, support, and stability of the prosthesis with minimal stress there should be a close interaction between the surgeon and the maxillofacial prosthodontist prior to tumor resection.

Conclusion:

The present case represents Armany's Class I classification showing partial resection of the hard palate, alveolar ridge, and dentition up till the midline. The defect was successfully managed by giving surgical and definitive obturator prosthesis for optimal restoration of stomatognathic functions.

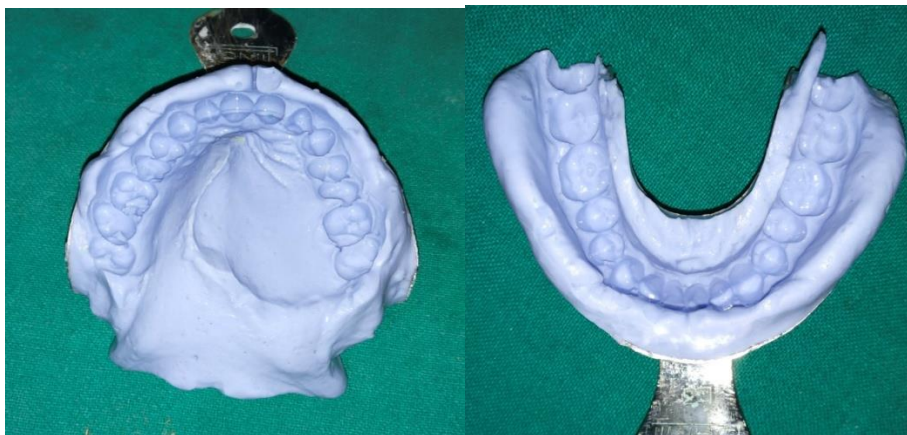
Figures**Figure 1: Extra oral view****Figure 2a & 2b: Intra oral view****Figure 3a & 3b: Primary impressions**



Figure 4a & 4b: Primary casts

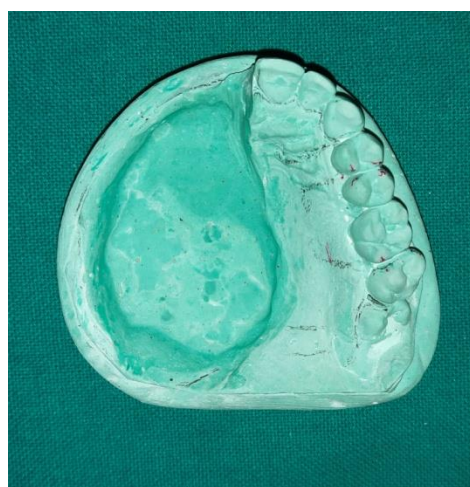


Figure 5: Maxillary cast obtained after arbitrary scraping of the lesion



Figure 6a & 6b: Adaptation of retentive components

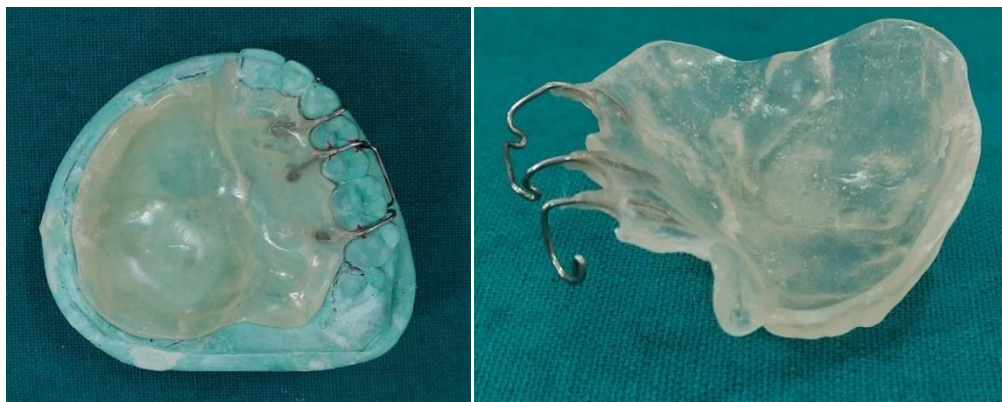


Figure 7a & 7b: Surgical obturator fabricated



Figure 8: Intra oral view after surgical resection



Figure 9: Intra orally placed surgical obturator

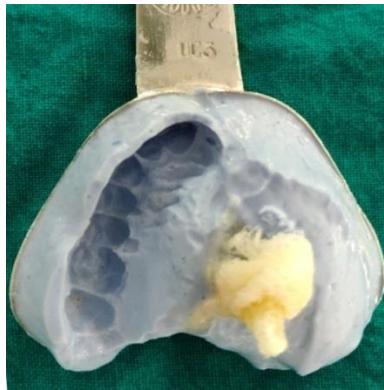


Figure 10: Primary impression

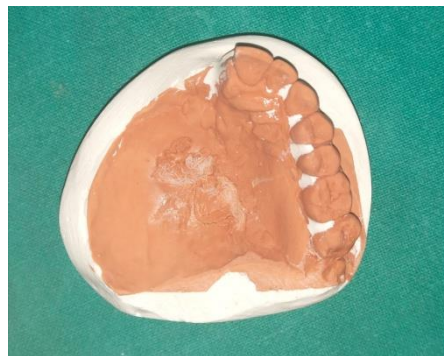


Figure 11: Primary cast

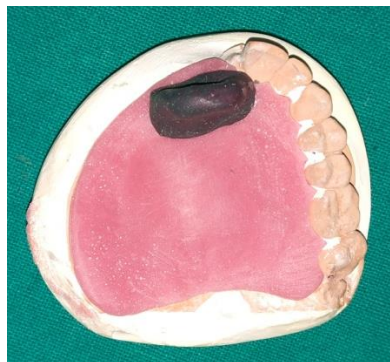


Figure 12: Custom tray

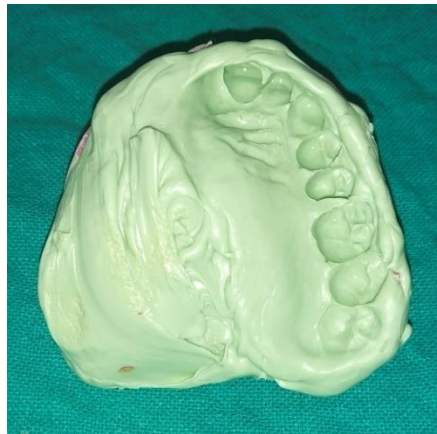


Figure 13: Final impression

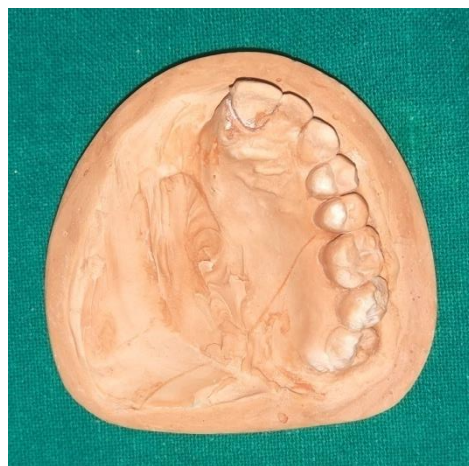


Figure 14: Master cast

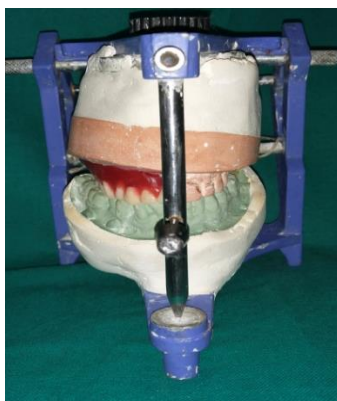


Figure 15: Teeth arrangement done



Figure 16: Try in done

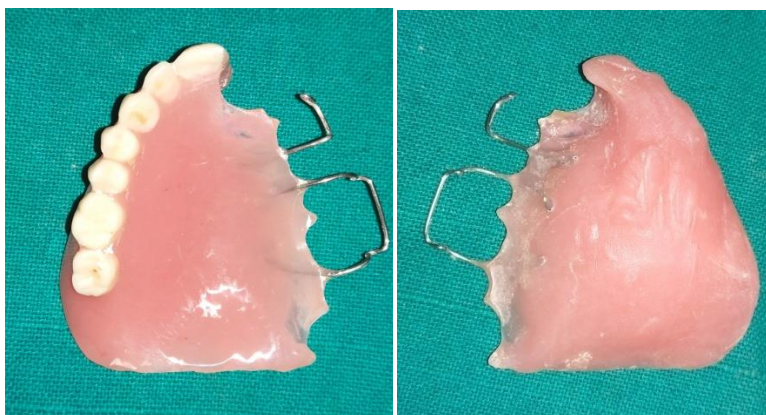


Figure 17a & 17b: Finished polished definitive obturator



Figure 18a & 18b: Final placement of definitive obturator

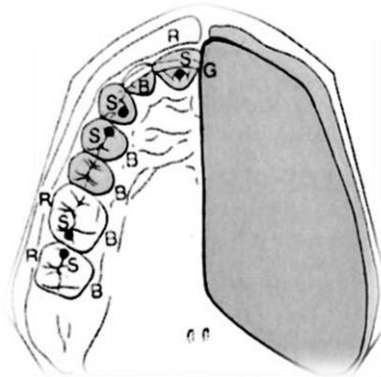


Figure 19: Armany's class I maxillary defect

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