Prosthetic rehabilitation of necrotic maxilla sequelae of faulty denture: report of a rare case

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Abstract Faulty complete denture can lead to deleterious effects on residual ridges. These deleterious effects are further severed if patient is systematically compromised as in Diabetes mellitus. Decreased resistance to infection, vascular changes, and altered tissue response seen in uncontrolled Diabetes when coupled with faulty denture prosthesis can even lead to gangrenous necrosis. Prosthodontic management of edentulous patient with maxillary defect is a challenging task because there is reduced denture bearing surface compromising adhesion, cohesion and peripheral seal thus affecting retention adversely; reduced support area for denture; air leakage due to poor stability; retentive deficiencies and movement of prosthesis during function. Prosthetic rehabilitation for these patients can be accomplished with minor modifications in procedures like incremental shaping technique for taking impression, modifications in jaw relation, tooth arrangement, and fabrication of hollow bulb obturator along with atraumatic and meticulous care during all the procedures. This clinical report describes a case of gangrenous necrosis of premaxilla caused due to a faulty previous prosthesis; and its prosthodontic management.

Keywords Necrosis · Diabetes mellitus · Prosthetic rehabilitation · Incremental shaping technique · Palatal obturator

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Introduction

The oral tissues are subjected to a wide variety of injuries as a result of wearing artificial dentures. These may be manifested in simple forms as traumatic ulcer, generalized inflammation, inflammatory hyperplasia or complex forms as denture base allergy, palatal papillary hyperplasia or even palatal necrosis depending upon the extent of abnormal denture stresses [1–5].

Certain systemic conditions further aggravate these adverse effects of dentures. These conditions include skin diseases, joint disorders, metabolic disorders, endocrinal disorders etc. Diabetes mellitus is one of the most common endocrinal disorder which alters many physiological processes [6–9]. Decreased resistance to infections, vascular and micro-vascular changes [8], altered tissues response seen in uncontrolled diabetes when coupled with

faulty denture prosthesis can even lead to palatal necrosis.

This case report describes a similar case of palatal necrosis caused by denture trauma in a diabetic patient and its prosthetic rehabilitation. The defect caused by removal of necrosed part creates a large cleft between oral and nasal cavity. Management of such defects in edentulous patient is a challenging task and should include comprehensive assessment of the patient, consideration for retention, stability, support and esthetics, certain modifications in dental procedures and patient motivation.

Case report

A 75-year-old edentulous and denture wearing patient reported to the Department of Prosthodontics, College of Dentistry,

Indore, with the complaint of some unusual growth of cord like structures in front part of palate which were causing irritation and inability to wear denture. He was unable to masticate and his speech was also affected.

History revealed that he was wearing his complete denture comfortably since last 16 years but few months back he noticed a hard tag in the palatal region which was progressive in nature and finally he observed that the whole palate was having cords hanging downwards. Systemic history revealed the patient to be diabetic since last 15 years and his treatment record showed frequent episodes of uncontrolled high blood sugar levels. He had even been hospitalized in the past many times for this.

On examination it was found that the anterior part of palate protruded downwards and showed dark brown colored raw bone without any overlying mucosa. It was accompanied by pus discharge. Denture of

Fig. 1 Preoperative photograph

Fig. 2 Necrosed part of maxilla

Fig. 3 Palate after removal of necrosed part

Fig. 4 Immediate obturator

Fig. 5 Determination of VD

Fig. 6 Teeth arrangement

Fig. 7 Maxillary denture with obturator

Fig. 8 Postoperative photograph

the patient was found to be discoloured, with severely deteriorated denture base material and posterior teeth were severely abraded with flat occlusal surfaces leading to increased overbite resulting in anterior interferences during mastication.

He underwent curettage and dressing several times but the condition did not palliate and a biopsy was taken. Histopathological examination revealed necrotic maxilla and a maxillectomy was planned. But before he could undergo maxillectomy the necrosed palate dropped off on itself during a forceful sneeze. The defect appeared as cleft in the anterior palatal region (premaxilla) upto molar region bilaterally. Margins of the affected area were clear and there were no signs of unhealthy granulation tissue.

Pathophysiology

The patient was known diabetic with history of uncontrolled blood sugar level. Diabetes mellitus is associated with poor blood supply due to vascular changes, increased susceptibility to infections due to decreased resistance, and altered tissue response [8].

The abrasion of all posterior teeth in the previous denture had resulted in anterior deep overbite. This had led to abnormal, unfavorable stresses in the anterior part of maxilla. These stresses combined with decreased resistance, opportunistic infections, vascular changes led to poor blood supply to the area subsequently causing gangrene of this part of maxilla. The gangrene spread upwards until it reached a point where

the blood supply was adequate to keep tissue viable. A line of separation was formed at this point between the gangrenous part and the viable part. Finally the gangrenous part eventually falls off on itself as being segregated from viable part.

Differential diagnosis

Necrosis of palate can also be seen in syphilitic gumma, histoplasmosis or mucormycosis. VDRL test and histopathological examination ruled out these possibilities and it was concluded that this necrosis of palate was because of localized unfavorable stresses aided with uncontrolled diabetes mellitus.

Prosthodontic management

Immediate obturation

When the necrosed part shed off a defect was left having oronasal communication. The patient was having nasal regurgitation of food and fluids and was not able to speak properly. An irreversible hydrocolloid impression was made using a perforated edentulous stock tray and an autopolymerizing acrylic resin plate was fabricated [10]. Medial undercuts of the defect were blocked out with gauze and lateral portion of the defect was used for retention of prosthesis [11,12]. It replicated palatal contours and thus restored palatal integrity. The objective of this prosthesis was to restore and maintain oral functions. This prosthesis was relined with soft liners at frequent intervals during the healing phase [12].

Definitive prosthesis

After four months, when the defect healed and was covered with healthy mucosa, a complete denture with obturator was fabricated [13,14].

Primary impression was taken in edentulous stock tray. Medial and anterior undercuts were blocked out; and remaining maxillary structures and useful portions of the defect were recorded [11,12]. Accurate diagnostic casts were fabricated from this impression.

Undesirable undercuts were blocked on the cast with wax and special tray was fabricated. Final impression was made by incremental shaping technique. Soft liner was placed incrementally on the tray and impression was made to capture a few centimeters at a time. This procedure was continued till the whole defect was impressed. Lateral undercuts were used to enhance retention.

Processed record bases were used for recording jaw relations [15]. Visibility and lip support was compromised for enhancing retention and stability. Horizontal overlap (overjet) was minimal. Vertical dimension of occlusion was kept at lower side to increase interocclusal space.

Modified-anatomical teeth were used and arranged according to bilateral balanced occlusion concept. During try-in teeth position were checked with respect to balance between lip support, visibility and retention. Palatal contours were checked for symmetry.

Complete denture was processed with hollow bulb obturator [13,14,16]. Polished surfaces were made concave to enhance

retentive ability by utilizing muscular support. Remounting and corrections were made. Prosthesis was delivered to the patient and homecare instructions given. Contrary to routine complete dentures patient was asked to wear this prosthesis at night. Periodic recall was made every 3 months. After 1 year patient was comfortable; prosthesis was well functioning, and oral health was excellent.

Proper systemic evaluation was carried out and necessary precautions taken according to prevailing conditions.

Discussion

Prosthodontic management of edentulous patient with maxillary defect is a challenging task because there is reduced denture bearing surface compromising adhesion, cohesion and peripheral seal thus affecting retention adversely; reduced support area for denture with maxillary defect due to necrosis of premaxilla. The air leakage due to poor stability; retentive deficiencies and movement of prosthesis during function added with the age of the patient, geriatric and systemic changes complicate the fabrication of denture for this patient. Certain special precautions were taken to enhance the prognosis of dentures.

Retention was improved by engaging key areas of defect for retention i.e. favorable undercuts; optimal extension of impression and proper contouring of polished surfaces of denture. Retention can be enhanced by recording nasal surface of soft palate; extending prosthesis in nasal aperture; and use of magnets or implants [17].

Support was derived from residual hard palate; oral side of soft palate. Stability was enhanced by engaging the defect appropriately especially the superolateral and medial wall.

Special care was taken during impression making, jaw relation recording and processing of dentures for such patients.

Impression was taken by incremental shaping technique. Soft liner was used to make such an impression. It was placed incrementally on the tray and impression was made to capture a few centimeters at a time. This procedure was continued till the whole defect was impressed. This multi step incremental impression technique offered advantage of accurate and passive recording of the key areas of the defect, with enhanced retention, stability and support in

comparison to conventional single step techniques.

During jaw relation recording visibility and lip support was compromised for enhancing stability. Optimum balance between the esthetic and function was established. Processed record bases were used in this case, as they are more stable [15]. The horizontal overlap was reduced in this case. Centric relation was recorded difficult to record. Therefore modified-anatomic teeth were preferred and arranged according to bilateral balance occlusion concept to distribute forces uniformly and hollow bulb Obturator was planned to reduce the weight of the prosthesis [13,14,16].

Conclusion

This case report is interesting because it represents a case of palatal necrosis caused due to faulty complete denture prosthesis aggravated by the systemic condition which was successfully treated with complete dentures prosthesis with obturator using modified fabrication techniques like incremental impression technique, reduced vertical dimension, reduced visibility and lip support, monoplane occlusal scheme and hollow bulb obturator while utilizing regularly available materials and equipment. Atraumatic approach during fabrication and service of dentures are very important in management of such cases while maintaining a constant attempt to control the systemic condition and regular recall and checkup.

References

1. William G. Shafer et al. (2003) A textbook of Oral Pathology. Saunders. Fourth Edition 548–552
2. Fisher AK, Rashid PJ (1952) Inflammatory papillary hyperplasia of palatal mucosa. Oral Surg Oral Med Oral Pathol 5(2): 191–198
3. Sachdeva S, Misurya R, Borle R (2006) Osteomyelitis of anterior maxilla – A Case Report. JDMIMS 2: 107
4. Budtz Jorgensen E (1970) Denture stomatitis. III. Histopathology of trauma and candida-induced inflammatory lesions of the palatal mucosa. Acta Odontol Scand 28: 551
5. Newton AV (1962) Denture sore mouth as possible etiology. Br. Dent J 112: 357–360

6. Davidson's Principal and practice of medicine (2006) 20th Edition 829–830
7. Dennis L Kasper et al. Harrison's Principal of internal medicine. 16th Edition 2: 2161–2185
8. PR Larsen et al. William's text book of Endocraniology. 10th Edition. 1511–1514
9. Robbins and cortran pathological Basis of disease (2007). 7th Edition. 23–25
10. Caputo TL, Ryan JE (1989) An easy, fast technique for making immediate surgical obturators. *J. Prosthet. Dent* 61(4): 473–475
11. Kenneth EB (1968) Peripheral consideration in improving obturator retention *J. Prosthet Dent* 20(2): 176–181
12. Parel SM, LauFuente H (1978) Single-visit hollow obturators for edentulous patients *J Prosthet Dent* 40(4): 426–429
13. Chalian VA, Barnett MO (1972) A new technique for constructing a one-piece hollow obturator after partial maxillectomy *J Prosthet Dent* 28(4): 448–453
14. Matalon V, LaFuente H (1976) A simplified method for making a hollow obturator *J Prosthet Dent* 36(5): 580–582
15. Kenneth EB (1969) Fabrication of a hollow-bulb obturator. *J Prosthet Dent* 21(1): 97–103
16. Minsley GE, Nelson DR, Rothenberg SL (1986) An alternative method for fabrication of a closed hollow obturator *J. Prosthet. Dent* 55(4): 485–489
17. Clinical maxillofacial prosthetics Thomas D. Taylor, Quintessence publishing, Co, Inc.

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