



Prosthodontic rehabilitation of compromised ridges using modified impression techniques: A case report

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Abstract

Compromised ridges in edentulous elderly people are a very common finding. A few of such situations are that of atrophic ridges and flabby ridges. The treatment of compromised ridges begins with an accurate impression that records the maximum denture bearing area without interfering with the movements in the functional state. This case report describes the rehabilitation of compromised ridges using all green technique and neutral zone concept for the atrophic ridges and modified Hobkirk technique for the flabby ridges.

Keywords: all green technique, atrophic ridge, flabby ridge, modified hobkirk technique, neutral zone

Introduction

When denture bearing areas are compromised, the challenge of ensuring adequate function increases significantly. The denture will be more stable if the denture bearing areas are recorded in the functional state. Difficulties arise, however, when the quality of the denture-bearing areas is insufficient for this purpose. Few amongst such compromised residual ridge situations are flabby ridge, atrophic ridges, and knife-edge ridges.^[1] The accuracy of the impression of the denture bearing and limiting areas is critical for the fabrication of a complete denture. Flabby ridge develops when the hyperplastic soft tissue replaces the alveolar bone and is a common finding in long-term denture wearers, particularly in the upper anterior region. Masticatory stresses can cause this mobile denture-bearing tissue to displace, causing denture instability and a loss of peripheral seal.^[2] Following extraction of the teeth, the rate of resorption of mandible is greater than that of maxilla, leading to more difficulty in the retention of the denture due to the decreased area for support and retention^[1]. Therefore, some modifications are needed to be done to accommodate the compromised ridge tissue in the complete denture. This case report describes the rehabilitation of compromised ridges using all green technique and neutral zone concept for the atrophic ridges and modified Hobkirk technique for the flabby ridges for the fabrication of a complete denture.

Case Presentation

A patient reported to the Department of Prosthodontics with the chief complaint of all the teeth missing in both maxillary and mandibular arches. Intraoral examination revealed a completely edentulous maxillary arch with flabby tissue present from the canine to canine region (Figure 1A) and a completely edentulous severely resorbed, low, and well-rounded mandibular ridge (Atwood Order V)^[3] (Figure 1B). All the possible treatment options including implant supported prosthesis, pre-prosthetic surgery followed by conventional denture, and conventional complete denture were all explained to the patient. Patient was willing for the conventional complete denture with necessary modifications, so a removable complete denture was planned for the patient. Consent was taken regarding the same.

The primary impression of the maxillary and mandibular arches were made using irreversible hydrocolloid impression material (Figure 1C) and the primary casts were obtained (Figure 1D). Double spacer wax was adapted on the flabby region of the maxillary cast (Figure 1E). The mandibular ridge was recorded using the all green technique^[4] (Figure 2A) and the final impression was made using zinc-oxide eugenol impression paste (Figure 2B). Border molding of the maxillary arch was done using the green stick impression compound followed by the final impression using zinc-oxide eugenol impression paste (Figure 2B). The impression material from the flabby tissue region was removed and was recorded again using light body consistency addition silicone impression material (Figure 2C). Master casts were then obtained (Figure 2D).

Jaw relations were recorded (Figure 3A) using the occlusal rims and mounted on the mean value articulator (Figure 3B). The mandibular occlusal rim was removed and spurs of stainless steel wire were made

corresponding to the rim height (Figure 3C). The neutral zone was recorded using polyether impression material by asking the patient to perform various movements like sucking, swallowing, licking, and pronouncing vowels (Figure 3D). A putty index was fabricated according to the recorded neutral zone (Figure 4A). Teeth arrangement was done using monoplane teeth according to the putty index (Figure 4B). Following which the try-in (Figure 4C) and insertion of the complete denture were done (Figure 4D). A regular follow-up following 1 week, 28 days, and 3 months was done. The patient was satisfied with the complete denture.

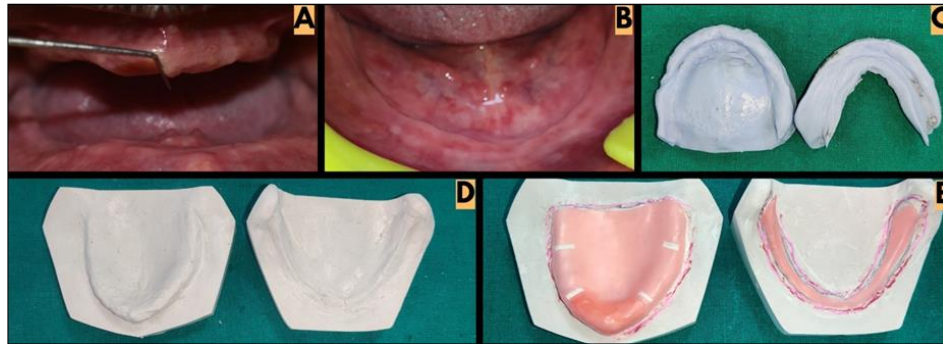


Fig 1: A) Completely edentulous maxillary arch with flabby tissue present from the canine to canine region; B) Completely edentulous severely resorbed mandibular ridge (Atwood Order VI); C) Primary impression; D) Primary cast; E) Double spacer wax on the maxillary ridge.

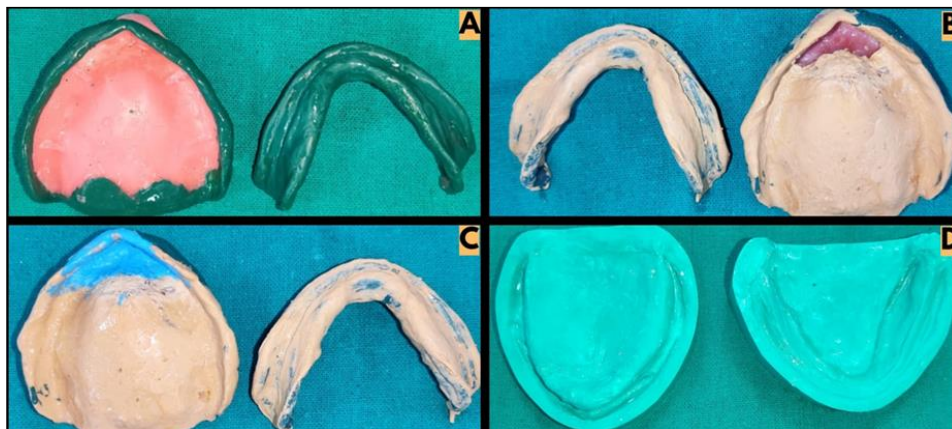


Fig 2: A) All green technique for the mandibular ridge; B) Final impression; C) Flabby tissue region recorded again using light body consistency addition silicone impression material, D) Master casts.

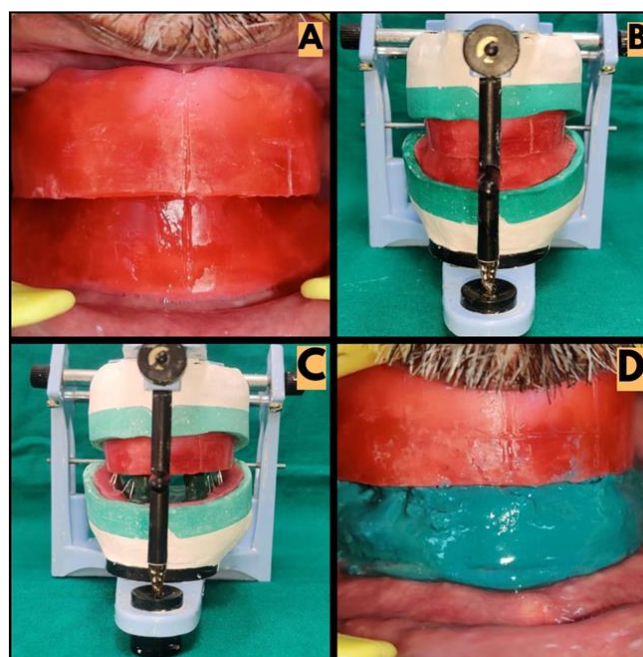


Fig 3: A) Recording of jaw relations; B) Mounting of rims on the mean value articulator; C) Spurs attached to the mandibular denture base; D) Neutral zone recording using polyether.

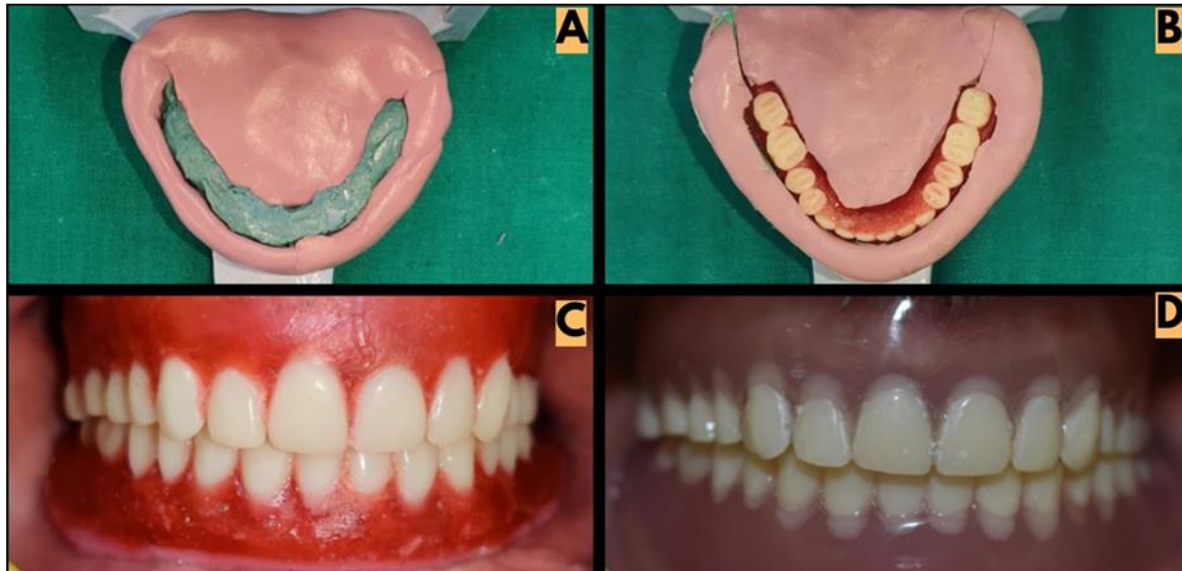


Fig 4: A) Putty index around the polyether material; B) Monplane teeth arrangement according to the putty index; C) Try-in of the complete denture; D) Insertion of the complete denture.

Discussion

A flabby ridge is a displaceable fibrous tissue found on the superior aspect of the alveolar ridge. According to Kelly, a flabby ridge is most usually found in the maxillary anterior region and is frequently accompanied with characteristics of combination syndrome. ^[5] Previous studies have found that the prevalence of flabby ridges varies with arch, with edentulous maxillae accounting for 24% and edentate mandibles accounting for 5%. ^[6] Conventional impression techniques compress the flabby tissue which tends to recoil and displace the denture. Various treatment options for flabby ridge are surgical removal of fibrous tissue, implant-supported prosthesis, and conventional complete denture fabrication with modified impression techniques. Surgical removal of fibrous tissue may not be indicated in a patient with a poor general health condition or who is unwilling for the surgery. Implant-supported prosthesis provide support from the underlying bone with minimal tissue support but have a few disadvantages like surgical complications, implant failure, and the cost factor ^[1].

Various techniques for recording the flabby ridge have been mentioned in the literature including the mucocompressive, mucostatic and selective pressure impression technique. Mucostatic impression technique has been found to be one of the most suitable techniques for recording flabby tissue ^[2]. This case report presents the modification of the Hobkirk technique ^[7] in which the final impression was made using the zinc oxide eugenol impression paste whereas the flabby tissue was recorded using light body addition silicone material. This is a feasible and non-cumbersome technique to record the flabby tissue in an undisplaced state.

Residual ridge resorption is a complex biophysical process resulting after the extraction of the tooth. It is maximum in the first year after extraction of the teeth followed by a slower rate of resorption thereafter. ^[8] Severe ridge resorption results in a non-retentive and unstable denture which leads to difficulty in performing routine activities like swallowing and mastication. Various impression techniques like admixed, all green, cocktail, functional, elastomeric impression technique have been mentioned in the past for the management of the resorbed ridges ^[4]. All green technique have the advantages of being readily available in the clinic, easily moldable, easily controlled to gain maximum coverage, records the load-bearing areas without distortion. ^[1] The neutral zone has an added advantage as it functions according to the oral musculature where there is a balance between the inward forces of cheeks and lips and the outward forces of the tongue. Impression compound, tissue conditioners, silicones, admixed material, waxes, polyether have been advocated to record the neutral zone. ^[9] When compared to other recommended materials for recording neutral zone, polyether impression material is a better choice because it has enough body and a good flow, simple to use, takes less time, and there's no risk of fracture or swallowing ^[10].

Conclusion

The principles of retention, stability and support are critical for the success of a complete denture. Modifications in the treatment plan should be considered in order to meet the functional and aesthetic needs of the patient. For a completely edentulous patient with compromised ridges, all of the following procedures were used to restore masticatory efficiency and improve comfort and aesthetics.

References

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