



Vestibuloplasty as an aid to enhance complete denture stability

Authors

Shuja U Rahman¹, Khurshid A Mattoo^{2*}, Tareq MH Qassadi³

¹Assistant Professor, Department of Prosthodontics, Mustaqbal University, KSA

^{2*}Assistant Professor, Department of Prosthodontics, College of dentistry, JU

³UG student, College of dentistry, JU

*Corresponding Author

Khurshid A Mattoo

Abstract

The background and the basis of mouth preparation before any prosthodontic treatment should be thoroughly kept in mind. Complete denture rehabilitation enhanced by pre prosthetic mouth preparation can improve the prognosis and outcome of a successful prosthodontic service. Vestibuloplasty is one such type of surgical mouth preparation that improves stability and retention of a denture. We present a case of an elderly female patient who reported dissatisfaction with newly made previous dentures. The main source of dissatisfaction being poor stability and retention. Intra oral examination showed severely resorbed mandibular residual alveolar ridge. A secondary epithelialization vestibuloplasty procedure using the Kazanjans technique with the help of a guided surgical splint was performed as part of preprosthetic surgical preparation. With an increase of more than five millimeter in ridge height, the patient compliance was substantially improved to new dentures.

Keywords: vestibule, epithelialization, bone graft, preprosthetic surgery, mouth preparation.

Introduction

The first step in carrying out any treatment is based on the principle of patient evaluation. This is not only to have an idea of what type of treatment will be necessary for a particular type of patient, but more importantly, can the goals of treatment be achieved with or without mouth preparation. Patients' expectations must be determined at this stage, which should then be evaluated to determine that whether they are realistic or unrealistic. Unrealistic promises by the clinician not only result in treatment failure, but also damage the clinicians reputation. However, it is important for a clinician to exhaust all available options in order to meet patients' expectations. Pre prosthetic surgery is one option which a clinician should be well versed since most of the surgeries are meant to improve denture

acceptance. Since the advent of osseointegrated implants as a therapeutic option for patients with mandibular atrophy, the need for such surgeries has decreased.¹ Mandibular residual ridge atrophy in completely edentulous patients has been a potential hazard for fulfilling treatment objectives of a complete denture prosthesis. Traditionally, such clinical situations have been successfully managed by vestibuloplasty procedure, with the main purpose being to correct the insufficient functional vestibular depth and limited keratinized gingiva.² Even with the use of implant supported complete dentures, vestibuloplasty may be required in certain cases to improve functional outcome of the prosthesis. There is ample evidence that implant supported overdentures have met a high success rate of about 95 percent,³ by providing better stability and quality

of life. There are many patients, however, who still due to economic non viability prefer conventional complete dentures.⁴

Common vestibuloplasty principles include submucosal, secondary epithelial and soft tissue grafting vestibuloplasty.⁵ Based on the principle of secondary epithelialization there are four common surgical techniques: Kazanjian, Clarks apically positioned flap, lip switch technique (multiple modifications) and Edlan- Mejchar technique.⁶⁻⁹

This article in the form of a clinical case report presents a case of an elderly female patient whose expectations were realistically achieved through the procedure of vestibuloplasty.

Case Report

An elderly female patient aged 72 years reported to the post graduate section of the department of prosthodontics with a chief complaint of dissatisfaction with existing dentures. The patient had got the current denture made about two months back, but the poor functioning of the new denture was concerning her. The patient was referred by a friend of hers, who had got her denture fabricated in the same department few months before. Medical, social and drug history did not impact existing treatment plan. The patient has been wearing multiple (4 in total) dentures for the last 8 years, but her main concern was regarding the mandibular denture which, according to her was very loose even though it was fabricated two months back. The patient reported in her dental history that the first denture was used by her for four years, while the second and third dentures approximately lasted for two and one and a half year respectively. According to her, last two dentures had been highly unsatisfactory as she was not able to control the mandibular denture during normal functions. Many times the mandibular denture would fall from her mouth upon laughing and during coughing. Patients mental attitude was philosophical with realistic expectations. Extra oral examination disclosed decreased labial support with exaggerated facial wrinkles (**Fig 1A**).



Figure 1: (A) Extra oral view (B) Intra oral view showing the relation between the vestibule and the crest of RAR on the left side (C) Surgical template (D) Horizontal semilunar incision

Intra oral examination revealed severely resorbed mandibular residual alveolar ridges (RAR) and moderately formed maxillary RAR. The labial vestibule in the mandible on the left side was very close (a range of 3 to 5 mm) to the crest of RAR (**Fig 1B**). After radiographic investigations the patient was presented with various treatment options that ranged from implant supported fixed prosthesis, implant supported removable prosthesis, conventional complete denture with balanced occlusion and vestibuloplasty. Based on economic feasibility, the patient chose the last prosthetic option. Preliminary irreversible hydrocolloid (CA 37; Cavex, Haarlem, Holland) impression for maxillary and mandibular arches were made and the diagnostic cast obtained from the impressions was analyzed for need of pre prosthetic mouth preparation. The area where vestibuloplasty was recommended was outlined and on a duplicate cast a clear acrylic self cure denture base resin (Fortex; Lucite Intl, Durham) surgical template was fabricated (**Fig 1C**). On the day of surgery, the patient was anesthetized locally and a submucous vestibuloplasty was done using the Kazanjains technique.

A deep incision and tissue reflection of labial and vestibular mucosa was carried from canine to canine region on the labial surface of the mandibular arch (**Fig 1D**). The incision was then extended posteriorly on the left labial side of the mandible. The vestibule was then deepened by a supra periosteal dissection (**Fig 2A, B**). The mucosal flap was turned downward from its attachment and

placed directly against the periosteum to which it was sutured (Linex, Monofilament) (**Fig 2C**). A rubber catheter stent was used to hold the flap in the new position and to maintain the extended depth of vestibule. The labial site was coated with tincture benzoin compound and allowed to granulate through secondary epithelialization. The catheter was removed after 7 days. Once healing was complete, routine clinical and laboratory procedures for complete denture fabrication were performed that included border molding (**Fig 2D**), jaw relations and

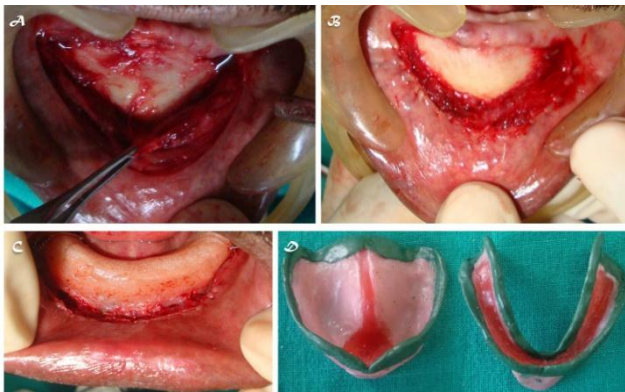


Figure 2: (A,B) Supra periosteal dissection deepening the vestibule (C) Suturing of mucosal flap (D) Border molded special trays



Figure 3: (A) Complete denture with improved labial flanges (B) Post insertion / post followup extra oral view denture trial. Denture was delivered to the patient and post insertion care instructions were given. On the day of denture insertion, a clinical remount was done to remove occlusal errors and the occlusion was evaluated for any interference in centric relation (**Fig 3A**). The patient was put on a follow up (1 day, 7 days, 1 month and 1 year). During her subsequent follow up appointments, the patient was extremely satisfied with the outcome of the prosthesis (**Fig 2B**).

Discussion

A complete denture treatment case has been presented that underwent a simple but effective procedure of vestibuloplasty to improve denture foundation. Two significant findings of this case are the quick biological response of secondary epithelialization vestibuloplasty even at the age of 72 years and meeting patients realistic expectations with minimal surgical intervention. The secondary epithelialization is basically formation of a new tissue over a wound. It has been established that predictable cicatricial fixation does not occur unless the bone is denuded or unless the continuity of the periosteum is interrupted in some way.¹⁰ It is also an attempt to create additional attached gingiva on the labial side of the mandibular RAR. Granulation tissue formation is prompt (7 to 10 days) in such procedures. The technique is more feasible in this region since the mandibular lip has a natural tendency to drape over the mandibular ridge thus affording a natural protection for the surgical site while eliminating the need for surgical dressing also. Bone resorption differs among gender due to differences in the hormonal composition and distribution that is age related. The available bone in the oral cavity at any time is the result of a balance between the bone resorption and bone deposition. Hormones that favor bone formation include insulin, growth hormone, insulin like growth factor (IGF-1), testosterone, estrogen, calcitonin and vitamin D (only mineralization) while bone resorption is increased in the presence of parathyroid hormone, cortisol and thyroid hormones (T3 and T4). Alteration of the balance between the activities of either osteoclasts and osteoblasts brings in resultant physical change in bone structure.¹¹ The osteoclastic activities increase with individuals age and in the presence of underlying systemic diseases especially metabolic disorders. Dietary factors are important to enhance osteoblastic activity during old age. A diet rich in protein along with diets rich in inorganic elements like salts (calcium, phosphorous and magnesium) and vitamins (A, B complex, C and D) is essential to synergize the effect of osteoblasts in old age.

Conclusion

Preprosthetic mouth preparations are an essential tool to improve poor denture foundations. Secondary epithelialization vestibuloplasty procedures are effective and bring immediate results.

Acknowledgements

The authors would like to thank the staff of the department of oral and maxillofacial surgery for their contribution to the treatment.

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