Pre-prosthetic Surgical Considerations

Treatment methods to improve the patient's denture foundation and ridge relations are usually either nonsurgical or surgical in nature, but can be a combination of both methods.

NONSURGICAL METHODS

Nonsurgical methods of edentulous mouth preparation include the following methods;

1. Rest for the Denture-Supporting Tissues

Rest for the denture-supporting tissues can be achieved by removal of the dentures from the mouth for an extended period or the use of temporary soft liners inside the old dentures. Both procedures allow deformed tissue of the residual ridges to return to normal form. Clinical reports and experience also support the merits of regular finger or toothbrush massage of denture-bearing mucosa, especially of those areas that appear edematous and enlarged.

2. Occlusal Correction of the Old Prostheses

An attempt should first be made to restore an optimal vertical dimension of occlusion to the dentures presently worn by the patient with an interim resilient lining material. This step enables the dentist to prognosticate the amount of vertical facial support that the patient can tolerate, and it allows the presumably deformed tissues to recover.

3. Good Nutrition

A good nutritional program must be emphasized for each edentulous patient. This program is especially important for the geriatric patient whose metabolic and masticatory efficiency may be compromise.

SURGICAL METHODS

Frequently, certain conditions of the denture bearing tissues require edentulous patients to be treated surgically. These conditions are the result of unfavorable morphological variation the denture bearing area or, more commonly, result from long term wear of ill-fitting dentures. It is often far easier to make alterations in the prosthetic techniques and materials used than to subject the patient to a surgical intervention. The key consideration is whether a good prosthodontic prognosis will result from the surgical outcome.

Surgical Guides (Templates)

When moderate amounts of bone recontouring are required and the treatment plan requires a degree of precision in the amount and location of bone to be removed, surgical guides are excellent adjuncts. Using a duplicated diagnostic cast, the areas of concern are modified to achieve the ideal ridge form. A clear rigid guide is then fabricated using a vacuum-formed technique. During the surgical procedure, after recontouring has been accomplished, the surgical guide is placed over the area with the flap repositioned, and areas of soft tissue blanching are observed. These blanching areas represent areas where additional removal of bone and recontouring are still required. This procedure is repeated until no blanching exists and the surgical guide is stable when seated. Soft tissue trimming, if necessary, can now be done.

Commonly Used Preprosthetic Procedures

1. Ridge alveoloplasty with or without extractions for recontouring of the knife edged ridge or other ridge deformity or contour problems.
2. Intraseptal alveoloplasty.
3. Maxillary tuberosity reduction.
4. Recontouring of palatal and lateral exostosis and contour problems these include: mandibular tori removal; maxillary tori removal; mylohyoid ridge reduction; and genial tubercle reduction.
5. Soft tissue procedures might include maxillary tuberosity soft tissue reduction, maxillary labial frenectomy, mandibular lingual frenectomy, and excision of redundant tissue.

Ridge Alveoloplasty with Extraction

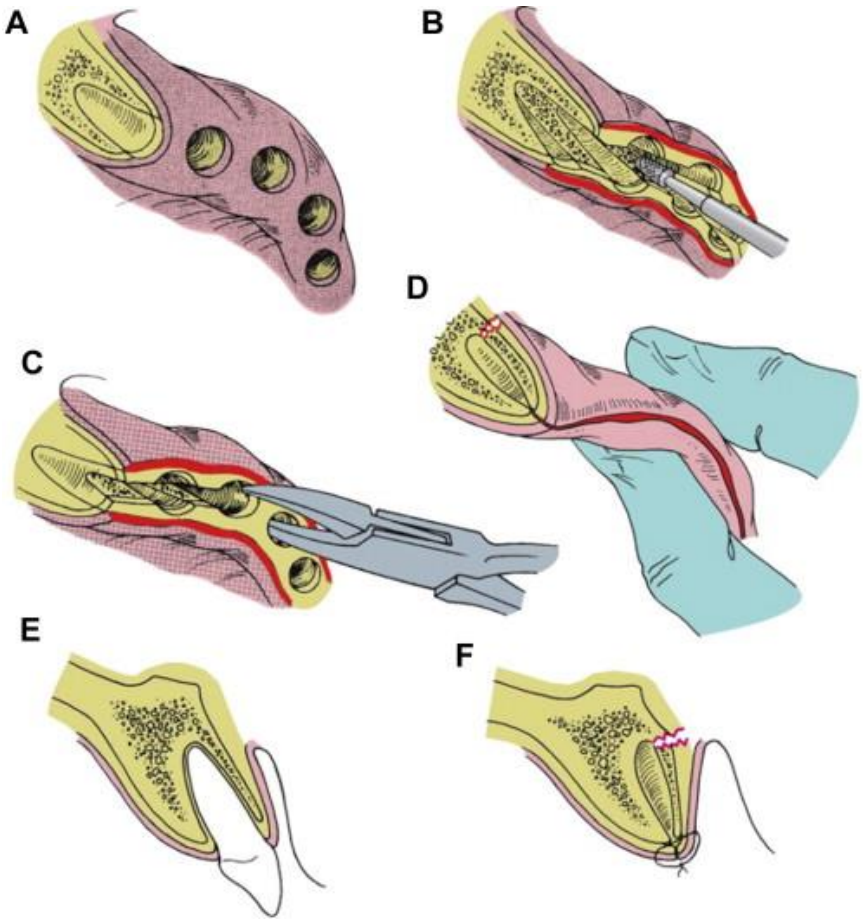
After extraction of a tooth or teeth, the clinician must make a determination about the appropriateness of the remaining ridge contour to fit into the preprosthetic plan, and if the recontouring will be made at the time of the extraction or at a later time. If more than finger compression is needed, a full thickness flap should be elevated to a point apical to the area in need of recontouring . Depending on the amount of recontouring needed, a bone file may be sufficient to produce the desired contours. For greater recontouring, a side cutting rongeur or handpiece and acrylic resin bur can be used, when using these burs, always use copious irrigation to avoid overheating the bone and subsequent bony necrosis. Irrigation also cleans the flutes of the bur and carries away debris. After bulk recontouring, a bone file is used to "fine tune" the recontoured bone.



Intraseptal Alveoloplasty

When the ridge has acceptable contour and height but presents an unacceptable undercut, which extends to the base of the labial vestibule, the intraseptal alveoloplasty might be considered. This procedure is best accomplished at the time of extraction or early in the postoperative healing period. After extraction of the teeth, the crestal tissue is slightly elevated to fully expose the extraction sockets. Using a small rongeur or handpiece and bur, the intraseptal bone is removed to the depth of the socket. After adequate removal

of bone, finger pressure is applied in a constant, controlled manner until the labiocortical plate is greenstick fractured **(**a greenstick fracture is a partial thickness fracture where only cortex and periosteum are interrupted on one side of the bone but remain uninterrupted on the other**)** and can be positioned palatally, narrowing the crest and eliminating the undercut. A bone file can be used to smooth roughened edges, and the site can be irrigated. The crestal soft tissue can now be approximated and closed with interrupted or continuous sutures. Ideally, a surgical stent or soft-tissue-lined immediate denture can be inserted to maintain the repositioned bony segment until the initial stages of healing have taken place, at about two weeks after the procedure.



Edentulous Ridge Alveoloplasty

For routine elimination of sharp (knife-edged) ridges and removal of undesirable contours, undercuts, or prominences, direct vision and frequent palpation until the desired endpoint is reached will be sufficient. When the mandibular or maxillary edentulous ridges require multifocal, moderate, or greater amounts of recontouring, use of diagnostic casts to identify areas of concern, and fabrication of surgical guides, are recommended. In this way, the clinician has a model with the specific areas outlined to assist in the exact orientation once tissues are reflected and if necessary, a surgical guide to assist with the detailed removal and recontouring of the bone. The edentulous ridge alveoloplasty begins with identification of the areas of concern. A full thickness flap is designed and implemented to fully expose the targeted areas. Using bone files/rasps, rongeurs handpiece, and burs or combinations, the targeted areas are recontoured. Digital palpation with the flap in place is done until the desired endpoint is achieved. The site is irrigated and close primarily with an interrupted or continuous suture technique.

Buccal Exostosis

This approach can be used on either arch and for irregularities on the palatal aspect of the maxillary alveolus. A crestal incision is made to extend beyond the margins of the areas requiring recontouring. A full thickness flap is elevated to completely expose the involved area. When an envelope flap will not provide the necessary exposure without placing tension on the flap, a releasing incision, as described earlier, may be incorporated into the flap design. For gaining access to a palatal exostosis, make the incision longer and reflect more tissue to gain enough relaxation in the flap. Because of the greater palatine and incisive branch anastomosis, vertical releases in the palate area not recommended. Once the irregularity is exposed, the tissue is elevated and protected, and the appropriate instrument is used to recontour the bone to the desired endpoint. The area is palpated through the flap to confirm adequate

reduction or recontouring. When completed, the area is irrigated and closed.

Maxillary Tuberosity Reductions

Maxillary hyperplasic tuberosities present real problems for gaining appropriate interarch distance posteriorly. The tuberosities can be hyperplasic in the horizontal or vertical planes, and may involve osseous hyperplasia, soft tissue hyperplasia, or both. To identify the hard tissue and soft tissue component that requires recontouring, a panoramic radiograph will usually suffice. This will provide information about the hard and soft tissue contributions and the overall contour of the tuberosity and proximity to the maxillary sinus. It is important to remember that maxillary sinuses may pneumatize into the tuberosity areas. A crestal incision is made from a point anterior to where the recontouring will start, over and up behind the tuberosity. Tissue must be elevated on both the buccal and palatal aspects to fully expose the tuberosity. After making sure that all soft tissue is protected, instrumentation can start. The tuberosity can be recontoured with bone file, rongeur, or bur if a great deal of bone needs to be removed, again as in other procedures, a surgical guide may be necessary. If the maxillary sinus has pneumatized, care must be taken when removing the bone and the sinus membrane may become exposed. However, this is not a problem as long as the membrane is intact.

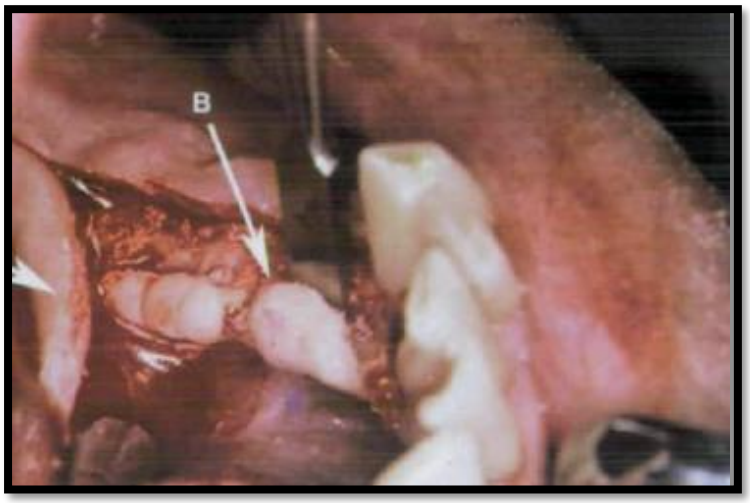


Mandibuiar Tori

In the dentate arch, tori pose few, if any, problems. *Occasionally tori can be large enough to interfere with tongue mobility and speech, and the thin mucosa overlying the tori may be chronically irritated or injured when eating certain foods. In the edentulous arch*, tori may pose significant interference when wearing a removable prosthesis and *often must be removed*.

After all tori have been removed and bone smoothed, the flap is repositioned and the lingual plate palpated to confirm achieving the desired contours.





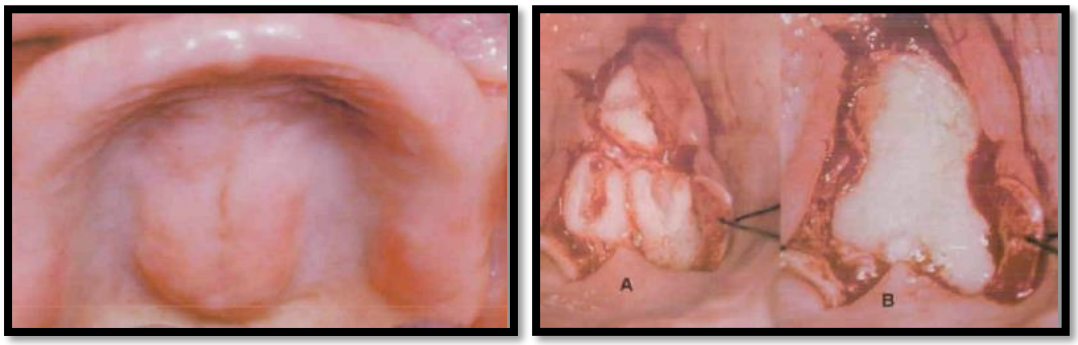
Maxillary Tori

Maxillary tori may pose a significant problem in the fabrication and wearing of a maxillary complete denture. The tori may be especially problematic when it is positioned more posteriorly, creating problems with posterior palatal seal of the prosthesis

A midline incision is placed over the torus with oblique releasing incisions at each end. When the tori are multilobulated and pedunculated, elevation of the thin mucosa may be difficult. After the torus is exposed, adequate flap control for best visualization is important. An excellent method of keeping the flaps open is to suture the margin of the flap to the crest of the ridge on the same side. For some larger pedunculated multilobulated tori, a midcrestal incision with elevation of the entire palatal mucosa is recommended. This dissection must stay subperiosteal to avoid injury to the palatal blood supply. The desirable end point is for the palatal vault to be smooth and confluent with no undercuts or elevations.

Hematoma formation in the palate under the flap is a great concern.

Excellent methods of applying pressure are with the placement of a temporary denture with soft reline material over the surgical site or with a well-fitting, surgical guide with soft reline placed over the area. The pressure should be maintained for several days. The patient can remove the appliances for local wound care and oral rinsing.





Mylohyoid Ridge Reduction

In the mandibular post-extraction ridge remodeling sequencing, the alveolar bone and external oblique ridge resorb because of lack of stressing and functional remodeling. The mylohyoid ridge, which supports the attachment of the mylohyoid muscle, remains relatively intact, and becomes a prominent feature in the posterior mandible. After providing profound anesthesia, a midcrestal incision is made anterior to the site of ridge reduction and carried posteriorly gradually deviating toward the buccal, to avoid potential injury to the lingual nerve. The flap is elevated to expose the mylohyoid ridge and attached muscle. Using sharp dissection, the tendenous attachments of the mylohyoid muscle are stripped.

When completed, the area should be copiously irrigated and closed primarily with interrupted or continuous sutures. Once the flap has been closed, ideally a denture with a soft reline is placed to allow for the lingual flange to help with *displacement* of the detached mylohyoid muscle.

Genial Tubercle Reduction

In the post-extraction ridge remodeling of the anterior mandible, the alveolar ridge and tooth-bearing areas resorb because of lack of stressing and functional loading. The superior pair of genial tubercles provides insertion for the paired genioglossus muscles, while the lower paired tubercles provide insertion for the paired geniohyoid muscles. Because of the constant movement of the tongue and stressing of the tubercles once the alveolus has

resorbed and remodeled, the genial tubercles can become very prominent structures in the anterior mandible and impede proper seating of the denture.

The clinician must be aware that this surgical site lies between two moving structures—the tongue and the lip. Therefore this is an area that may be prone to wound dehiscence. Making this a very difficult surgery. With exposure of the bone and protection of the flap, the bone height can be reduced with the instrument of choice to the desired level. The wound is copiously irrigated and closed primarily.

