Preprosthetic Surgery

16

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"I will compress the story as far as may be done without omitting anything vital to the case."
Sherlock Holmes in—The Crooked Man

Abstract

Proper performance of preprosthetic surgery entails a systematic and detailed review of the patient's medical and dental history, appropriate imaging, preoperative models, and a thorough understanding of the patient's goals for prosthetic treatment. This chapter will provide an overview of preprosthetic surgery. Surgical techniques will be reviewed and complications will be discussed.

16.1 Introduction

The primary goal of preprosthetic surgery is to establish a functional and healthy platform for support and retention of prosthetic devices. Preprosthetic surgery performed by the general dentist is a service that can be comfortably and efficiently provided to the dental patient. It alleviates patient scheduling and traveling to another practitioner's office and allows continuity of care with the primary dental provider. When prostheses are to be delivered at time of surgery, this allows for immediate adjustments of the removable or fixed prosthetics at time of delivery. As the prevalence of edentulism among American adults is noted to be as high as 16.3% (rural settings), with predictions that 8.6 million Americans will be edentulous in

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2050, the current and future needs for preprosthetic surgery continue to exist (Miloro et al. 2011; Vargas et al. 2002; Slade et al. 2014).

Radiographic imaging may guide the practitioner with treatment planning and surgical options. The panoramic radiograph serves as the best initial image for evaluation of hard tissue and any existing pathology. This initial radiograph can serve as a tool for making measurements for potential bony reduction, identifying anatomic variants, evaluating of the maxillary sinuses, locating root tips or impacted teeth, and identifying the location of the inferior alveolar canal and mental foramina. The use of cephalometric analysis used in conjunction with mounted models serves as a tool for aiding the practitioner in establishing an appropriate path of insertion for prostheses and identifying interarch relationships that may complicate the prosthetic treatment plan. Additionally, computed tomography (CT) radiographs may be used for some cases where detailed evaluation of bone quality and contour, precise neurovascular location, and sinus anatomy are of interest.

Preoperative models not only assist in treatment planning, e.g., for the reduction of a soft tissue tuberosity, but can also be used for model surgery, e.g., for the fabrication of clear stents to be used either postoperatively or to judge appropriate reduction of the surgical site.

Paramount to preprosthetic surgery is a thorough evaluation of the hard and soft tissue form in the maxilla and mandible. The practitioner should carefully visualize, palpate, and examine the soft tissue overlying the alveolar ridges and the associated muscle attachments. Ideally, the maxilla and mandible should be in a normal relationship. The alveolar processes should be as large as possible without the presence of protuberances or undercuts. The arches should be broad and U-shaped, the width of the maxilla should be as similar to that of the mandible as possible to provide good stability, and the jaws should be oriented in a dental Class I position Starshak and Sanders (1980). Bone and soft tissue should be free of disease, with uniform gingival thickness and consistency. The vestibules should be free from scar tissue or pathology. The tongue should be freely moveable without disease or a restricting frenum. Adequate salivary gland function must be intact so as to keep the mouth, and subsequent prostheses, moist and lubricated. All of these characteristics must be noted prior to the initiation of preprosthetic surgery. A thorough initial examination will help the practitioner create a clear and concise plan for subsequent surgery.

It also must be stressed that successful surgery involves appropriate expectations from the patient. Proper preoperative discussion of goals, including risks and benefits of the preprosthetic procedure, will ultimately assist with patient understanding of successful surgery.

16.2 Factors to Consider When Performing Preprosthetic Surgery

16.2.1 Local Anesthesia

The practitioner should be thoroughly knowledgeable in the administration of local anesthesia, as discussed in Chap. 7. The principles of administering local anesthesia for preprosthetic procedures are the same as for other routine dental procedures;

profound analgesia is best obtained by nerve block technique, and soft tissue hemostasis is best achieved by using the local anesthetic with a vasoconstrictor applied locally to the surgical site El-Kholey (2013). It is important to take into account the distorting effect of local anesthesia on soft tissues when performing preprosthetic surgery. Applying direct pressure to the site and waiting for several minutes after administration will help minimize this tissue distortion while maximizing the effect of the vasoconstrictor. As a simple technique, soft tissue preprosthetic surgery tends to be performed with administration of local anesthesia directly in the surgical field, whereas bony surgery frequently relies on nerve block anesthesia with some local infiltration to assist in dissection and/or hemostasis.

16.2.2 Surgical Technique

When creating access for hard or soft tissue surgery, full-thickness flaps are the preferred method of access in most bony surgery, especially in simple preprosthetic surgery. Partial thickness flaps are used in more advanced and specific surgical techniques, which are not covered in this chapter.

Proper flap technique allows for adequate blood flow to the entirety of the flap, thereby decreasing the incidence of flap necrosis. Flap access to the surgical site should offer adequate exposure, whether with a direct flap or with the addition of releasing incisions. Flaps should be kept moist, noting the longer the flap is open, the more likely the chance of injury to the flap, suboptimal healing, or infection.

When performing bony preprosthetic surgery, consider trimming any redundant mucosal tissue and/or using a surgical splint to reinforce any areas of potential dead space. If a properly relieved postoperative stent is available, this will help protect the wound from direct trauma and decrease the chance of hematoma formation. Clear (transparent) stents are recommended so that the wound site is visible in the postoperative period.

16.3 Hard Tissue Removal

16.3.1 Alveoloplasty

Alveoloplasty is the recontouring of the bone in an area that previously was dentate, specifically involving the alveolar bone. The immediate goal in performing an alveoloplasty is to provide adequate ridge contour in order to facilitate fabrication of a well-fitting and esthetic prosthetic device. In evaluating alveolar ridges for alveoloplasty, the practitioner should aim to leave the ridges as broad as possible to distribute masticatory load. Undercuts should be identified and removed if their presence would hinder in denture retention. Sharp edges should be rounded, and the mucosa overlying the alveolus should be uniform in thickness and compressibility for even transmission of masticatory forces. Care must be taken not to over-reduce the alveolus, as resorption occurs over time. Furthermore, if implants are being considered for restoring the alveolar ridge, alveoloplasty should be performed judiciously to allow for a broad site with adequate bone height for implant placement.

Alveoloplasty may be performed at the time of dental extractions or anytime following exodontia. For efficiency and patient comfort, alveoloplasty should be ideally performed immediately following exodontia in most cases. There are scenarios, however, in which delayed alveoloplasty is indicated. If the immediate removal of the bone will result in a narrow, V-shaped ridge, it is advisable to wait for the bone to fill the extraction sockets prior to performing alveoloplasty (4–6 weeks). Additionally, in cases of advanced periodontitis with severe resorption of the alveolar and interradicular bone, allowing for bony healing prior to performing alveoloplasty will prevent over-reduction of the alveolus.

16.3.2 Technique

During exodontia, the full-thickness mucoperiosteal flap must be maintained, and consideration should then be given to extending the flap or performing releasing incisions to fully expose the surgical site. The practitioner must be cognizant of areas of anatomy to avoid when creating the flap, e.g., mental foramina. Releasing incisions should avoid neurovascular structures, and in the edentulous, possibly atrophic mandible, the mental foramina may be on or close to the alveolar ridge, and the incisive papilla may also be positioned in a similar fashion. Preoperative radiographs can aid in locating the mental foramina. A bone file, irrigated rotary bur, or rongeur forceps are then used to reduce the areas of the irregular bone. The surgical site is then inspected with the gingiva reflected back into place and palpated with a gloved finger to evaluate any irregularities or sharp edges. When satisfactory reduction is complete, the wound is closed primarily with silk or resorbable sutures.

For alveoloplasty performed at a later date than the exodontia, a full-thickness flap is initiated at the occlusal aspect of the alveolar ridge. Proper exposure may involve elongating the incision and/or adding releasing incisions. Once the bone is properly exposed, a bone file, irrigated rotary bur, and/or rongeur forceps are used to shape the areas of the irregular bone. The surgical site should then be inspected, palpated, and closed primarily as described above.

16.3.3 Palatal Torus

A palatal torus is a benign, slowly growing bony projection on the maxilla that is prevalent in the adult population. Palatal tori have a dense cortical surface with a cancellous core, and they vary in shape and size. A palatal torus can be comfortably removed in the office with local anesthesia. The anxious patient may require some anxiolytic intervention, and the patient with a strong gag reflex might require nitrous oxide supplementation or sedation.

Palatal tori serve no useful purpose, yet they do not need to be routinely removed. Indications for removal of a palatal torus include interference with the tongue, speech and/or mastication, chronic trauma, biopsy or evaluation for pathology, a source of autogenous bone for grafts, or preparation for delivery of dental prosthesis.

Preparation for any preprosthetic surgery entails appropriate review of medical and dental history and evaluation of radiographs for bone-related surgery. Radiographs for soft tissue surgery are not always necessary but are recommended for bone-related surgery. Preoperative models of the maxilla are very helpful in planning torus surgery. The torus can be conservatively reduced on the models, and an interim thermoplastic splint can be fabricated from the model surgery. This splint will act as a guide, assisting in evaluating the amount of bony reduction sought surgically.

16.3.4 Technique

Local anesthesia is recommended via bilateral greater palatine block, nasopalatine block, and infiltration. The infiltration should be attempted in a subperiosteal fashion in an attempt to freely elevate the soft tissue off of the torus. This aids the dentist in flap dissection and decreases the chance of flap perforation. A "Y" or "double Y" (−< or >−<) incision is made over the torus. Careful incisions are made in an attempt to avoid the palatine vasculature. Once the flap is reflected and the torus is exposed in its entirety, surgical removal can commence (Fig. 16.1).

A fissure bur with saline irrigation can be used to score the torus. Once scored, a chisel or elevator can be used to remove the bony fragments. A round bur and bone file are then used to smooth the surface of the palate. If the palatal torus is small, it can be removed via chisel, reduced with round bur, and filed with a bone file or any combination thereof. Copious irrigation is recommended throughout the procedure. Once the torus is completely removed, the soft tissue flap edges should be approximated, and the surgical site should be evaluated for bony irregularities or redundant soft tissue.

If a bony irregularity can be felt, a bone file can be used to file the rough edges. Failure to do this may contribute to wound dehiscence. It is also important to ensure not to over-reduce the bony torus. A good strategy for proper reduction without over-reduction is to intentionally leave a miniscule amount, e.g., less than half a millimeter, of bony torus during reduction, and then complete the remainder of the reduction with a bone file.

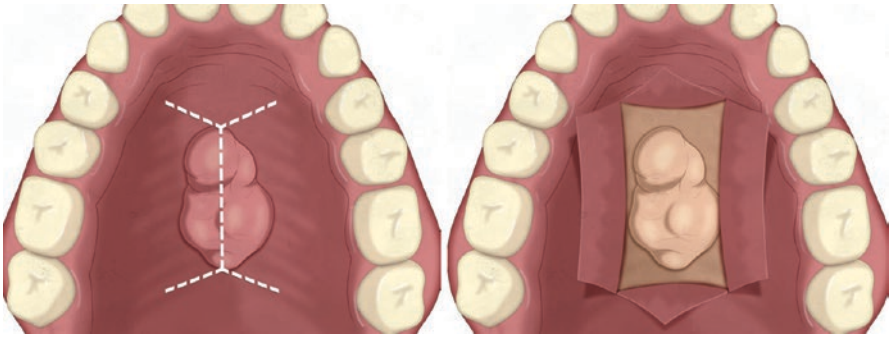

Fig. 16.1 Double "Y" flap design for removal of a palatal torus

If the torus is large, there may be a significant amount of redundant soft tissue remaining following bony reduction. This tissue has a large area of potential dead space, which can lead to hematoma formation under the flap. It is recommended to conservatively trim excessive mucosa, while still maintaining a primary, linear closure. Once the wound is closed, the dentist may consider placing a clear denture type stent for wound protection. The stent should be relieved so as not to place pressure on the wound. If not properly relieved, this can lead to pressure necrosis.

The patient should begin a soft diet postoperatively and advance the diet slowly as tolerated.

16.3.5 Complications

Despite appropriate patient selection, the practitioner may experience the occasional patient that cannot commence with surgery once they have a completely anesthetized palate. Anxiety, gagging, and or nausea may be so profound that the surgery may require rescheduling and/or pharmacologic assistance.

Infection is relatively rare, but clean incisions and dissection assist in wound healing. Inadequate cooling/irrigation while using rotary instruments can cause bone necrosis, thus increasing possibility of wound dehiscence or infection.

Perforation into the nasal or maxillary sinus, or fracture of bone in these regions, is a potential unexpected outcome. A small perforation can be managed by applying firm pressure with gauze in order to achieve hemostasis. In rare cases, it may be necessary to pack the nasal cavity with gauze strips to achieve hemostasis.

Hemorrhage is a potential complication that can be avoided by clean incisions that avoid the greater palatine and nasopalatine vasculature. In the event of persistent bleeding, injecting a small amount of local anesthetic with vasoconstrictor and application of firm pressure usually resolve the bleeding. In instances of persistent bleeding, electrocautery may be required to achieve hemostasis.

Wound dehiscence can occur from many ways, including flap dissection with tears, a palatal splint with excessive pressure on the mucosa, or attempted removal of a torus with improper access. If dehiscence does occur, the wound should be covered with a temporary stent to facilitate application of tissue conditioner until wound healing has occurred.

16.3.6 Mandibular Tori and Maxillary/Mandibular Exostoses

A mandibular torus is a benign bony growth of the mandible that usually occurs bilaterally on the medial (lingual) surface of the body and alveolar process of the mandible. Like palatal tori, the overlying mucosa is typically very thin. Indications for mandibular tori removal include interference with speech, interference with comfortable chewing, ulceration and poor healing of the overlying mucosa, and facilitation of removable denture construction.

Buccal exostoses occur on the buccal aspect of the either the maxilla or mandible. They occur near the crest of the alveolar process, most commonly in posterior areas. Exostoses typically present problems for the prosthetic patient, as they can interfere with retention and stability, and they may pose difficulty in obtaining accurate impressions.

16.3.7 Principles of Torus and Exostosis Removal

A full-thickness mucoperiosteal flap offers proper wound protection at closure and is the recommended approach to removing bony growths of the jaws. Consider releasing incisions if appropriate for exposure and to avoid encroaching on neurovascular structures.

Lingual mandibular flaps or releasing incisions can create additional morbidity to the patient, and caution should be used in deciding to attempt surgery on the lingual aspect of the mandible for multiple reasons. The abundance of salivary glands and ductal structures are at risk for direct and indirect damage. The lingual nerve and artery vary in anatomic location in all patients, and in part this is related to changes in alveolar architecture in the edentulous alveolar segment as well as muscle pull caused by tongue movement. Lingual flaps have greater potential for injury to the mylohyoid muscle and lingual nerve and artery. In the third molar region, variants in the course of the lingual nerve are not uncommon, and studies have noted the presence of the lingual nerve at the height of the mandibular third molar in a significant percentage of patients. Therefore, surgical access in this location, including lingual releasing incisions, is not advised (Pogrel et al. 1995).

In the edentulous mandible, the location of the mental foramina migrates superiorly, and exiting mental nerve branches may limit the extent of soft tissue surgery. In the edentulous patient, the mylohyoid muscle and lingual nerve also move superiorly. Careful clinical and radiographic examination can assist the dentist in evaluating these parameters.

16.3.8 Technique

A full-thickness mucoperiosteal flap is the access of choice for bony growths of the mandible and maxilla. Keeping in mind key anatomic areas to avoid, the bony growth is fully exposed, by linear ridge incision in the edentulous patient or an intrasulcular flap in the dentate patient (Fig. 16.2). Releasing incisions are recommended if the linear/intrasulcular incision is of adequate length, but exposure is still inadequate (Fig. 16.3).

Lingual releasing incisions of the mandible are not advocated for reasons previously discussed. The flap is reflected and protected with a retractor of the practitioner's preference (Fig. 16.4).

The retractor will keep the surgical field exposed and also act as a protective barrier to the surrounding anatomical structures. A combination of one or many devices can

Fig. 16.2 Sulcular incision with small anterior releasing incision (Avoid splitting the papilla at the junction of the release. This diagram has the release too close to the papilla)

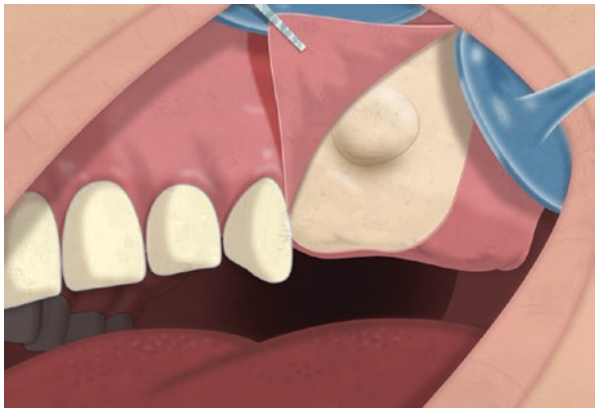

Fig. 16.3 Large posterior relaxing incision in an edentulous area

be used to remove the exostosis/torus. A fissure bur can be used to score the growth, followed by removal by chisel or elevator. With the lingual torus, the fissure bur can be used to create a linear channel into the cancellous region of the bony growth, at the interface of the alveolus and the torus. This linear channel, placed mesial to distal, will allow the placement of a chisel or elevator to chip off/elevate the exostosis. If the exostosis is small, a round bur or bone file can be used to physically reduce and remove the growth, rather than creating the channel. It is important to note that copious sterile saline irrigation is recommended when using rotary instruments to alter bony structures. Excessive heat will create postoperative bone necrosis, increase the risk of infection, and contribute to increased postoperative discomfort for the patient. Once the bony growth is removed, the surgical site should be inspected and palpated to feel for any sharp edges or bony excess. With mandibular tori, the practitioner will frequently need to file a small step at the inferior-most aspect of the wound. One must be very careful to protect adjacent soft tissues when working in this anatomic area, as soft tissue injury here may be very dangerous. Hemorrhage, glandular obstruction, nerve injury, and airway embarrassment are some of the potential complications that could occur with soft tissue injury at the floor of the mouth.

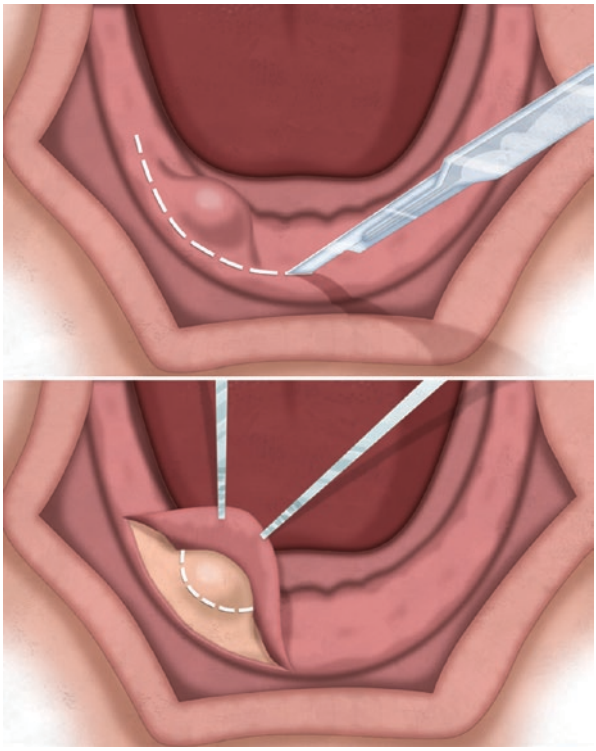

Fig. 16.4 Lingual flap for removal of torus using a crestal incision and no relaxing incisions

As with most bone-related preprosthetic surgery, care should be taken to not over-reduce the bony protuberance. Once the surgery is completed, the underlying bone will continue to undergo some degree of bone resorption and remodeling. One technique for completing bony reduction involves using a bone file: this allows for tactile sensation while smoothing off rough edges and clinically visualizing proper bone reduction. If the majority of a bony prominence is removed via handpiece, the remaining finishing touches can be performed with the bone file.

Primary closure with either silk or resorbable sutures is recommended. Postoperative thermoplastic splint protection is not necessary for these procedures, but fabricating a clear surgical stent as a surgical guide may be helpful.

Removal of exostoses of the maxilla and mandible will create some postoperative discomfort for the patient. This tends to be localized and well-tolerated. Removal of lingual tori tends to be locally painful in the postoperative period and may also cause some discomfort with swallowing. Diet may be more affected with the lingual tori patient, and bruising of the neck, and later dependent bruising discoloration to the chest, will usually be more evident. In light of these postoperative findings, proper preoperative patient teaching will better prepare the patient for a better postoperative recuperation.

16.4 Soft Tissue Removal

Following tooth loss, muscle and frenum attachments may interfere with prosthetic fit, esthetics, and function. It is therefore necessary to carefully evaluate soft tissue interferences prior to fabricating prostheses. It is important to remember, however, that hard tissue remodeling must be performed prior to removal of soft tissue. Soft tissue is often used to aid in grafting and augmentation procedures, so preservation of soft tissue should be attempted when possible.

16.4.1 Frenectomy

Frenum attachments consist of thin mucosa overlying fibrous tissue bands, which extend from the buccal, labial, or lingual mucosa to the alveolar periosteum. Following tooth removal, frenum attachments commonly become more prominent and may interfere with the fit of removable prostheses.

There are multiple techniques available for performing frenotomy, including simple excision and Z-plasty for narrow frenum attachments, and vestibuloplasty for wider frenum attachments.

The following technique describes the surgical removal of the maxillary midline frenum (Fig. 16.5). Other modalities include laser and electrosurgery, which are not discussed in this chapter.

16.4.2 Technique

One must consider the tissue distorting effects of local anesthetics prior to injecting the soft tissue. Regional anesthesia has the benefit of avoiding tissue distortion at the site of excision. However, local infiltration affords the benefit of hemostasis. When administering local anesthesia via infiltration, gentle direct pressure with gauze should be placed on the frenum and lip for several minutes so as to help dissipate the soft tissue distortion. The upper lip is then everted to allow for

Fig. 16.5 Maxillary midline frenum

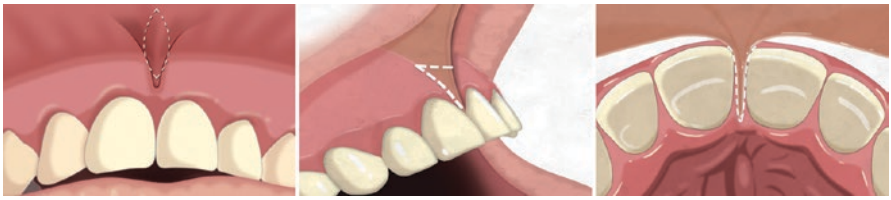

Fig. 16.6 Remove triangular wedge from the maxillary frenum

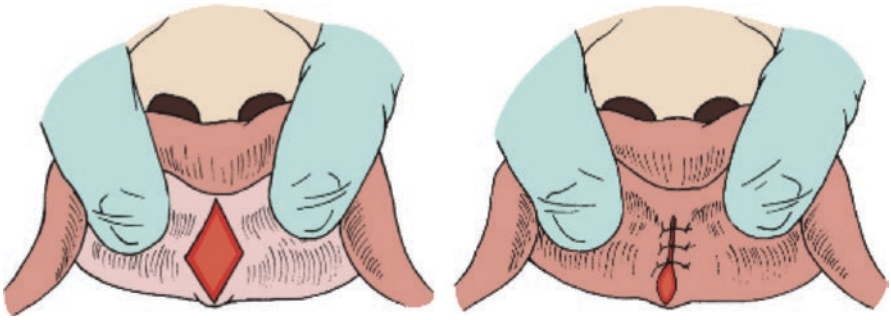

Fig. 16.7 After removal of tissue from the maxillary frenum, with underlying periosteum. Closure with simple interrupted sutures. With permission: Hupp JR, et al. "Preprosthetic Surgery." Contemporary Oral and Maxillofacial Surgery, 5th ed., Mosby Elsevier, 2008

adequate visualization. A hemostat can be used to hold tension on the frenum, while an elliptical incision is made around the frenum in a supraperiosteal fashion. Sharp dissection is then performed, ensuring that the underlying mucosa and connective are removed, while preserving the periosteum (Fig. 16.6). Upon removing the hemostat with the excised frenum still engaged, one will notice a triangular- or diamond-shaped wound, as the elastic fibers will pull the mucosal edges apart. At this time, the wound edges should be inspected to determine if adequate soft tissue has been removed. If there is a superior edge of puckered frenum mucosa, this triangular tissue can be excised with a scissor. Occasionally, dense, fibrous, mucosal tissue will be remaining at the alveolar ridge. This soft tissue will also require excision, noting that it is removed while leaving the underlying periosteum intact on the alveolar ridge. The incisive papilla should not be involved in the palatal-most extent of the dissection.

Following complete dissection of the frenum and underlying connective tissue, there are two methods of achieving primary closure. If wound edges are approximated and vestibular depth is adequate, simple closure can be performed with resorbable sutures in an interrupted fashion (Fig. 16.7). It is important to note that the sutures should encounter the periosteum in order to preserve alveolar ridge height and anatomy Hupp et al. (2008).

If there is concern for shallow vestibular depth, Z-plasty can be performed. Two releasing incisions are made: one from the superior-most point of the wound, angled

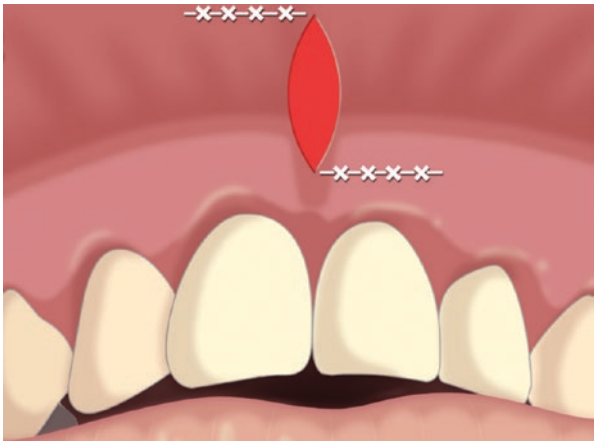

Fig. 16.8 Horizontal releasing incisions for Z-plasty in labial frenum repair

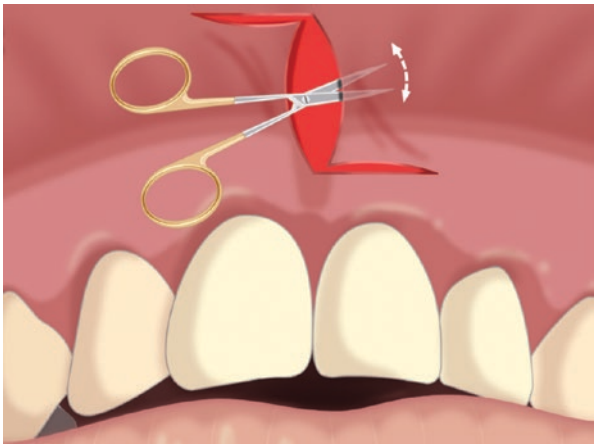

Fig. 16.9 The mucosa underlying the flap margins is freed to relieve tension

laterally and inferiorly, and the other from the inferior-most point of the wound, angled in the opposite lateral direction and superiorly (Fig. 16.8). The mucosa under each side of the flap should be freed with either sharp scissors or a periosteal elevator to relieve tension on the flaps (Fig. 16.9). The resulting two flaps are then rotated, creating a Z-shape, which allows for horizontal closure of the vertical wound (Fig. 16.10).

Localized vestibuloplasty can be performed for broad-based frenum attachments. An incision is made along the superior aspect of the frenum attachment, and dissection is made to expose the underlying periosteum. The mucosa is then repositioned more apically and sutured to the underlying periosteum. Healing occurs via secondary intention.

Lingual frenum attachments are unique in that they may interfere with speech or tongue range of motion. Like labial frenum attachments, they often interfere with denture stability. Local anesthesia for a lingual frenectomy can be achieved through bilateral lingual nerve blocks and local infiltration. The tongue can be retracted

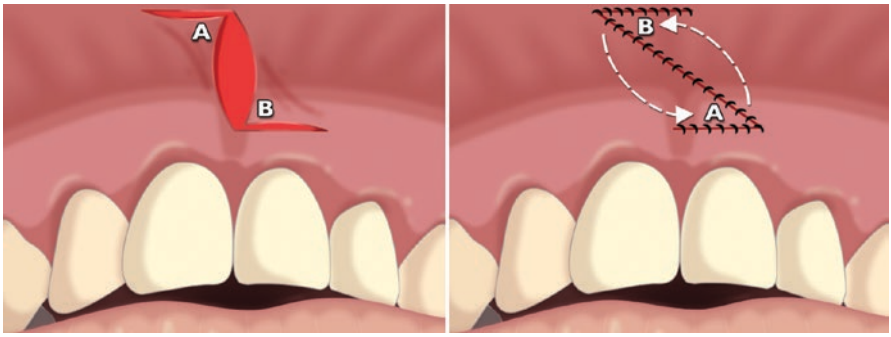

Fig. 16.10 Incision following a labial frenectomy with horizontal releasing incisions, prior to closure. The flap margins (marked A and B) are rotated inferiorly and superiorly, respectively, closing the soft tissue. The resulting Z-shaped incision can then be closed primarily with sutures

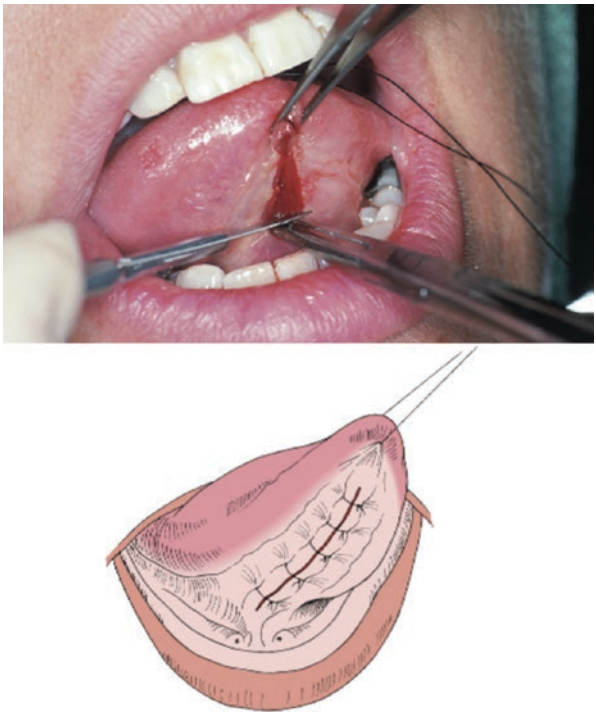

Fig. 16.11 Incision of lingual frenum attachment with scalpel blade, followed by closure with simple interrupted sutures. With permission: Hupp JR, et al. "Preprosthetic Surgery." Contemporary Oral and Maxillofacial Surgery, fifth ed., Mosby Elsevier, 2008

either via a suture through the tip of the tongue or by manual retraction with gauze. A linear incision is then made transversely through the frenum at the base of the tongue, releasing the connective tissue attachments. Closure is performed in a linear direction, thereby releasing the ventral aspect of the tongue from the alveolar ridge Hupp et al. (2008). Care must be taken to avoid Wharton's ducts and superficial vessels on the floor of the mouth (Fig. 16.11).

The patient should be instructed to maintain a soft diet for several days to minimize strain on the wound and also should be advised that some swelling will be noticeable for a few days. Ice packs in the postoperative period will aid in patient comfort and may decrease swelling.

16.4.3 Soft Tissue Tuberosity of the Maxilla

Tuberosity reduction tends to be more often a soft tissue procedure than a hard tissue endeavor. Preoperative radiographic evaluation will assist in initial treatment planning. A quality panoramic radiograph may be sufficient to evaluate the soft and hard tissue in the area of surgery. Mounted models of the maxilla and mandible are invaluable planning aids for tuberosity reduction, both for hard and soft tissue surgery. The goal is to achieve adequate interarch distance between the maxillary and mandibular denture, while not reducing the entire tuberosity.

The mounted models can be manipulated so as to reduce the tuberosity on stone via model surgery. The altered model of the maxilla can then be used to create a clear thermoplastic surgical guide to assist the surgeon intraoperatively. This will guide the surgeon with appropriate reduction of the tuberosity.

The objective of the soft tissue surgery is to decrease the occlusal height of the tuberosity without disrupting the distal hamular notch region. It is important to preserve landmarks that make up part of the denture borders. An elliptical incision is made in the fibrous tuberosity, starting just anterior to the hamular notch (not involving the notch). The incisions are extended anteriorly in an elliptical shape, meeting at a point on the center of the alveolar ridge just anterior to the area of the intended reduction (Fig. 16.12). It is important that the initial incision is full thickness. In order to achieve optimal wound approximation and minimize soft tissue injury, it is prudent to aim the

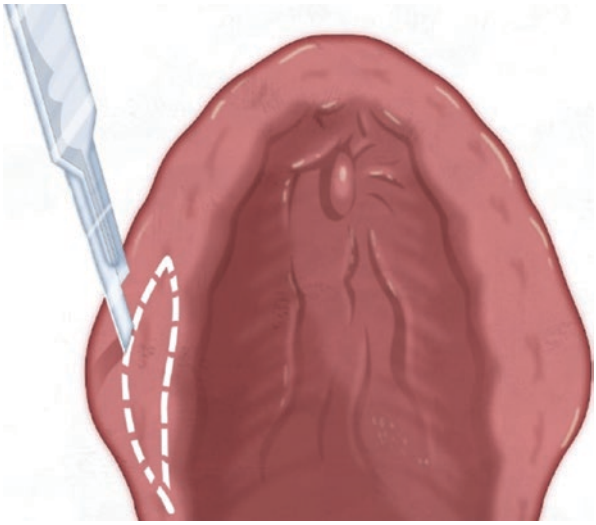

Fig. 16.12 Elliptical incision over the alveolar ridge for soft tissue tuberosity reduction

Fig. 16.13 Undermining of the soft tissue following tissue removal to facilitate wound edge approximation. Closure with simple interrupted sutures

scalpel with a slight bevel toward the center of the alveolar ridge. Once the elliptical incision is completed, a periosteal elevator or curette is used to free the underlying periosteum of the elliptical wedge and remove the wedge. Once the wedge is removed, the wound is inspected for any soft tissue tears or fragments. A periosteal elevator is then used to undermine the periosteum bordering the wedge defect so as to mobilize soft tissue. This will aid in bringing wound edges together. The wound edges are suture closed, and the interocclusal clearance is then inspected (Fig. 16.13). A surgical stent/guide would be used at this time to evaluate amount of reduction. In some instances, the practitioner will find adequate reduction but will be unable to get complete primary closure of the wound edges. The edges should be sutured as close as possible to each other without tension on the edges. This will granulate and close with time.

16.4.4 Complications

Potential complications of soft tissue tuberosity reduction include perforation of palatine vessels and oral-antral communication. Palatine vessels can be avoided by keeping the incision within the tuberosity and beveling the scalpel toward the center of the alveolar ridge. This will also help keep the shape of the tuberosity, a vital landmark in denture fabrication. If excessive pressure or aggressive reduction takes place on the underlying alveolar bone, it is possible to perforate the bone and expose the maxillary sinus. This iatrogenic oral-antral communication may require further treatment.

16.5 Conclusion

Preprosthetic surgery is a service that the general dentist can provide to their patients to facilitate the transition to removable and/or fixed prostheses. Reduction of both hard and soft tissues can be performed in the office setting and, when appropriate, can minimize trips to other providers for additional procedures. It is essential to appreciate the patient's medical and dental history, utilize appropriate imaging, and consider the use of preoperative models for predictable surgical planning.

References

El-Kholey KE. Infiltration anesthesia for extraction of the mandibular molars. J Oral Maxillofac Surg. 2013;71(10):1658e1–5.

Hupp JR, et al. Preprosthetic surgery. In: Contemporary oral and maxillofacial surgery. 5th ed. St Louis: Mosby Elsevier; 2008.

Miloro M, et al. Preprosthetic and reconstructive surgery. In: Peterson's principles of oral and maxillofacial surgery. 3rd ed. USA: People's Medical Pub. House-USA; 2011.

Pogrel MA, et al. The relationship of the lingual nerve to the mandibular third molar region: an anatomic study. J Oral Maxillofac Surg. 1995;53(10):1178–81.

Slade GD, et al. Projections of U.S. Edentulism prevalence following 5 decades of decline. J Dent Res. 2014;93(10):959–65.

Starshak TJ, Sanders B. Preprosthetic oral and maxillofacial surgery. St Louis: Mosby; 1980.

Vargas CM, et al. Oral health status of rural adults in the United States. J Am Dent Assoc. 2002;133(12):1672–81.