

Dental Alveoloplasty: Principles, Techniques, and Clinical Significance in Oral Rehabilitation

Todd Brower DDS, MA*

Assistant Professor of Restorative Clinical Sciences, University of Missouri-Kansas City, USA.

*Correspondence:

Todd Brower DDS MA, Assistant Professor of Restorative Clinical Sciences, University of Missouri-Kansas City, USA.

Received: 03 Oct 2025; Accepted: 15 Oct 2025; Published: 31 Oct 2025

Citation: Todd Brower. Dental Alveoloplasty: Principles, Techniques, and Clinical Significance in Oral Rehabilitation. J Med - Clin Res & Rev. 2025; 9(11): 1-2.

ABSTRACT

Alveoloplasty is a fundamental oral surgical procedure aimed at reshaping and smoothing the alveolar bone following tooth extraction or before prosthetic rehabilitation. This technique refines the bony contours of the maxilla and mandible to create a stable, functional, and esthetically suitable foundation for dentures or other oral prostheses. By removing irregularities such as sharp ridges, exostoses, or tori, alveoloplasty facilitates proper mucosal adaptation, improved jaw movement, and long-term comfort for the patient. This review explores objectives, indications, and various methods of alveoloplasty as well as potential complications associated with systemic medical conditions.

Keywords

Alveoloplasty, Ridge recontouring, Exostosis, Mandibular tori, Maxillary tori, Prosthodontic preparation, Oral surgery, Bone contouring, Dental surgery, Pre-prosthetic surgery.

Introduction

Alveoloplasty is a pre-prosthetic surgical procedure designed to reshape the alveolar ridge of the maxilla and mandible to achieve a smooth, rounded, and properly contoured bony base. It is essential following multiple extractions or in the presence of irregular bone formations that interfere with prosthesis adaptation.

Anatomical and Functional Significance

The alveolar process is a dynamic structure that undergoes remodeling throughout life, particularly after tooth loss. Uneven resorption or excessive bone proliferation (such as tori or exostoses) can distort the ridge profile. Alveoloplasty reconfigures the bony architecture, smoothing high spots, reducing prominent ridges, and removing undercuts to allow proper prosthetic adaptation.

Indications

- Presence of irregular or sharp bony ridges after extractions.
- Bony undercuts or prominences preventing denture adaptation

- Large tori of the palate or mandible interfering with prosthetic seating.
- Exostoses or hyperplastic bone formations.
- Combined surgical and prosthetic treatment planning for edentulous arches.
- Pre-implant site preparation or ridge preservation.

Techniques and Instrumentation

Alveoloplasty encompasses several surgical techniques ranging from simple smoothing of extraction sockets to full-arch ridge contouring under flap reflection. The simple alveoloplasty technique, commonly performed after extractions, uses rongeurs and bone files to remove sharp spicules and smooth irregular contours. When ridge irregularities are extensive, a full-thickness mucoperiosteal flap is elevated to expose the underlying bone. Rotary carbide or diamond burs under copious irrigation are employed to contour cortical bone, followed by smoothing with a bone file. Piezoelectric instruments are increasingly favored for their ability to selectively cut mineralized tissue while sparing soft tissue structures.

Hemostasis is achieved with pressure, electrocautery, or bone wax when necessary. Meticulous flap design is critical—typically crestal

or slightly palatal/lingual incisions—to ensure tension-free closure and preservation of vestibular depth. Suturing is performed with resorbable materials to prevent dehiscence and promote primary intention healing. For extensive tori or exostoses, bone removal is executed in layers, and irrigation prevents thermal necrosis. The surgeon must maintain awareness of anatomical landmarks such as the mental foramen, greater palatine artery, and lingual nerve during all procedures.

Essential instrumentation includes periosteal elevators, rongeurs, rotary handpieces, piezosurgical units, bone files, hemostatic agents, and suction-irrigation systems. For modern practice, piezoelectric surgery offers enhanced precision, reduced postoperative discomfort, and improved healing compared with conventional rotary instruments.

Postoperative Care and Healing

Postoperative recovery after alveoloplasty is influenced by surgical technique, systemic health, and oral hygiene compliance. A sterile field and atraumatic manipulation promote primary healing. The patient should apply intermittent ice during the first 24 hours, maintain hydration, and avoid smoking, alcohol, and mechanical irritation. Analgesic management typically involves NSAIDs or acetaminophen; narcotics if necessary; in more extensive cases, short-term corticosteroids may be used to minimize edema. Antibiotic prophylaxis is indicated in immunocompromised or medically complex patients.

Oral hygiene instructions emphasize gentle rinsing with chlorhexidine or saline solution beginning 24 hours post-surgery. Dietary advice includes a soft, high-protein diet and avoidance of hard or spicy foods. Sutures are removed at 7–10 days, at which point soft tissue closure is usually stable. Osseous remodeling continues for 3–6 months, allowing optimal ridge morphology for denture fabrication or implant placement. Follow-up appointments at 1 week, 1 month, and 3 months are essential to monitor tissue integrity and ensure prosthetic readiness.

Complications and Medical Considerations

Complications are generally minor when proper technique and patient selection are observed. Early postoperative issues may include pain, swelling, ecchymosis, hematoma, or transient paresthesia. Infection and wound dehiscence are uncommon but

may occur with poor flap adaptation or hygiene. Management includes drainage, irrigation, and antibiotic therapy when indicated. Excessive bone removal can compromise ridge height and prosthetic stability, underscoring the need for preoperative prosthetic collaboration.

Systemic factors play a major role in outcomes. Diabetic patients exhibit delayed healing and higher infection risk; hypertensive individuals require hemodynamic monitoring during surgery. Patients on antiplatelet or anticoagulant therapy may require medication adjustment. Bisphosphonate or denosumab users are at risk for medication-related osteonecrosis of the jaw (MRONJ); atraumatic technique and avoidance of bone exposure are mandatory. Cancer therapy, corticosteroid use, and immunosuppression further complicate wound healing. Meticulous preoperative assessment, medical consultation, and postoperative surveillance are essential to mitigate these risks.

The Dentist as Oral Surgeon

Dentists are skilled surgeons of intraoral and extraoral regions, trained to handle bone, soft tissue, and complex anatomical structures. Performing alveoloplasty demands knowledge of flap design, hemostasis, and wound management. It embodies the integration of surgical precision with restorative vision [1-5].

Conclusion

Alveoloplasty remains an essential oral surgical procedure ensuring patients regain functional, esthetic, and comfortable oral anatomy. By restoring natural bony contours and removing deformities, it facilitates prosthetic success and enhances quality of life. A thorough understanding of surgical principles and systemic considerations ensures safe, predictable outcomes.

References

1. Peterson LJ, Ellis E, Hupp JR, et al. Contemporary Oral and Maxillofacial Surgery. 7th ed. Elsevier. 2022.
2. Fonseca RJ. Oral and Maxillofacial Surgery. 3rd ed. Saunders. 2018.
3. Misch CE. Contemporary Implant Dentistry. Mosby. 2020.
4. Babbush CA. Preprosthetic Oral Surgery. Quintessence. 2017.
5. Pogrel MA. Surgical management of the edentulous ridge. J Oral Maxillofac Surg. 2019; 77: 953-962.