

Localized Vertical Maxillary Ridge Preservation Using Bone Cores and a Rotated Palatal Flap

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The aim of vertical augmentation of the alveolar ridge is to restore resorbed alveolar ridges. This technique is critical to the placement of dental implants in a favorable position and the enhancement of restoration esthetics. The present report describes a technique for surgical preservation of the anterior maxillary process using maxillary bone from the surgical site and raising a soft tissue rotated palatal flap. Maxillary lateral incisor extraction and periapical surgery of the central incisors were first carried out. Two bone cores were harvested from the neighboring buccal vestibular region and placed in the sockets of the lateral maxillary incisors. After 3 months, implants were placed; 12 weeks later, the prosthetic restorations were cemented. There were no complications after 2 years of follow-up. This technique constitutes a viable approach for preserving the anterior sector alveolar ridge with the posterior placement of dental implants. INT J ORAL MAXILLOFAC IMPLANTS 2005;20:131-134

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Implant success requires adequate quality and dimensions of the bone and surrounding soft tissues in the edentulous region. The morphology of the alveolar process determines the appearance of the peripheral soft tissues and subsequently the esthetic outcome of the definitive implant restoration.^{1,2} These considerations are particularly important in the anterior maxillary region.

Alveolar bone loss results following tooth extraction, infection, and trauma, together with papilla and

soft tissue collapse. Such loss is also important from a functional perspective. In effect, important discrepancies between the position of the alveolar crest and the occlusal plane can lead to unfavorable crown-to-root ratios and excessive implant loading stress.³ The most common practice is to use autologous bone grafts, eg, from the chin or retromolar zone.⁴⁻⁶

The present report describes a technique for surgical preservation of the anterior maxillary process using maxillary bone from the surgical site and a rotated soft palatal flap.

CASE REPORT

A 28-year-old woman without pathologic antecedents of interest presented with pain and swelling episodes in the maxillary anterior region. Intraoral exploration revealed a fixed partial denture including all 4 maxillary incisors, with extensive gingival

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Fig 1 Intraoral clinical view showing a ceramometal fixed partial prosthesis extending from lateral incisor to lateral incisor.



Fig 2 A radiographic view. The maxillary incisors have been subjected to endodontic treatment and prosthetic rehabilitation. Note the presence of periapical radiolucencies in the maxillary incisors and the perforation in the maxillary left lateral incisor area.



Fig 3a Intraoperative image of the bone cores; the osteotomy was performed using a trephine bur.

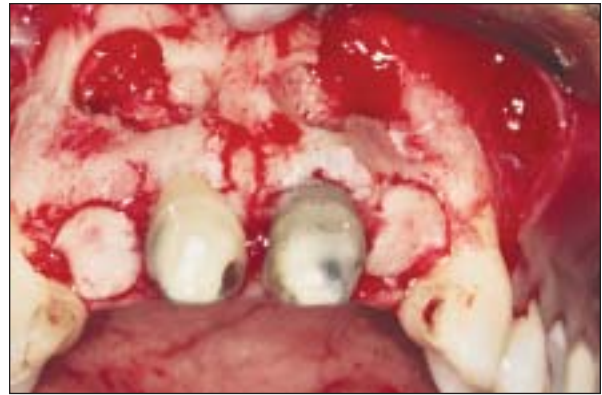


Fig 3b Intraoperative image following extraction of the maxillary lateral incisors and periapical surgery of the maxillary central incisors. The 2 bone cores were tapped into the beds of the maxillary lateral incisors.



Fig 3c Lesion suturing; the rotated palatal flap can be seen.



Fig 3d Radiographic image after the first surgical step. Retrograde filling of both central incisors was done with amalgam.

caries affecting the 2 maxillary lateral incisors that allowed passage of the periodontal probe over the entire extent of the crown (Fig 1). The radiographic examination revealed a periapical translucency in the region of the maxillary incisors (Fig 2). Extraction of the 2 lateral incisors was planned, with periapical

surgery of the central incisors and implant placement in the lateral incisor sites.

Surgery was performed under local anesthesia (2% articaine with 1:100,000 adrenaline) using a trapezoidal full-thickness flap with vertical incisions. The maxillary lateral incisors were extracted, revealing



Fig 4a Intraoral clinical image corresponding to the second surgical step.



Fig 4b Two implants were placed in favorable positions.



Fig 4c Adequate adaptation of the prosthetic restoration can be seen in this radiograph.



Fig 4d The prosthetic restoration after cementation.

inflammatory periapical tissue, and curettage was subsequently performed. Vertical and horizontal bone defects were observed after the extractions. Maxillary central incisor apicoectomies were performed with ultrasound and diamond tips, followed by non-gamma-2 silver amalgam retrograde filling. Histologic study of the periapical lesion showed the presence of inflammatory tissue, with abundant leukocyte and lymphocyte infiltration.

A bone core was grafted from the neighboring buccal vestibular canine region using a 6-mm trephine bur under abundant sterile saline irrigation (Fig 3a). The bone cores, measuring 6 mm in diameter and 3 mm in thickness, were placed over the lateral incisor sockets, which previously had been filled with small bone shavings. The cores, were stabilized by tapping them against the sockets (Fig 3b). Since primary soft tissue sealing was not possible, rotated soft palatal flaps were raised (Fig 3c). The vestibular bone cavities were filled with collagen sponges (Hémocolagène, Septodont, Kent, United Kingdom), while surgical cement was applied to the palatal zone (Peripac, Dentsply, York, PA). Suturing was performed with 000 silk, and amoxicillin (500 mg 3 times a day for 7 days)

was prescribed, along with 0.12% chlorhexidine mouthwash. Special care was taken to prevent the provisional prosthesis, placed over the central incisors, from applying pressure to the surgical gingival site. There were no postoperative complications (Fig 3d).

Three months later, rotary instruments and osteotomes were used to create the osteotomies and place 2 Defcon implants (Impladent, Barcelona, Spain) measuring 3.6 mm in diameter and 14 mm in length. The implants were submerged at favorable positions and angles (Figs 4a to 4c). Twelve weeks later the implants were exposed and prosthetic restorations were cemented onto the central incisors and implants, yielding a favorable esthetic result (Fig 4d). No problems or complications have been recorded after 2 years of follow-up.

DISCUSSION

Surgical correction of vertical alveolar defects can be performed either before or concurrently with implant placement.⁷ One disadvantage of the single-step approach is the possibility of graft (and thus

also implant) failure.⁸ Furthermore, it is more difficult in such cases to predict the esthetic outcome of the soft tissue.⁹ However, simultaneous surgical correction and implant placement reduces the number of operations required and offers the possibility of stabilizing the bone grafts with the implants.² Rasmusson and associates⁷ preferred to place the implants 8 weeks after bone grafting, since implant integration was improved as a result. Periapical infection in the present case necessitated a 2-step procedure.

The canine periapical zone was chosen as the donor site because of the ease with which a graft could be obtained and the quality of the bony tissue. The possibility of obtaining a chin graft was dismissed because opening a second surgical site would potentially increase patient discomfort and the risk of possible complications.^{10,11}

Stabilization was achieved by tapping the bone into the socket, thereby avoiding the need for screws. It is very important to prevent the provisional prosthesis from exerting pressure on the gingiva, as this could lead to graft reabsorption, movement, and nonintegration, as well as soft tissue necrosis.¹²

Periapical surgery was performed with the ultrasound technique (Piezon Master 400 EMS; Electro Medical Systems, Nyon, Switzerland) and silver amalgam.¹³

In the present patient treatment, a 2-step approach was adopted for implant placement to encourage a superior soft tissue esthetic outcome. With the rotated palatal flap it was possible to achieve primary coverage of the surgical site, with first intention healing and an increase in keratinized tissue, in accordance with the recommendations of other authors.^{14,15}

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