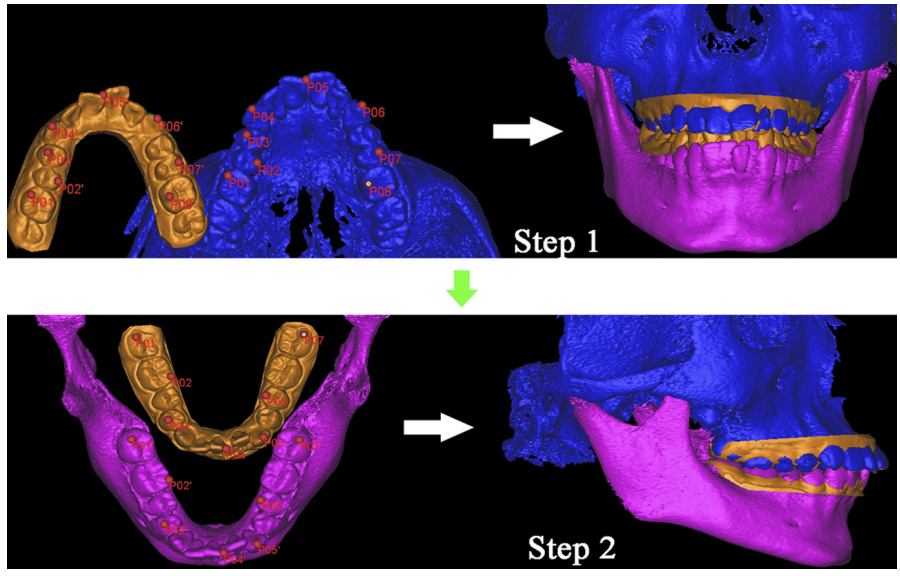

FIGURE 3. Moving the mandible to RCP by integrating the plaster models in RCP.

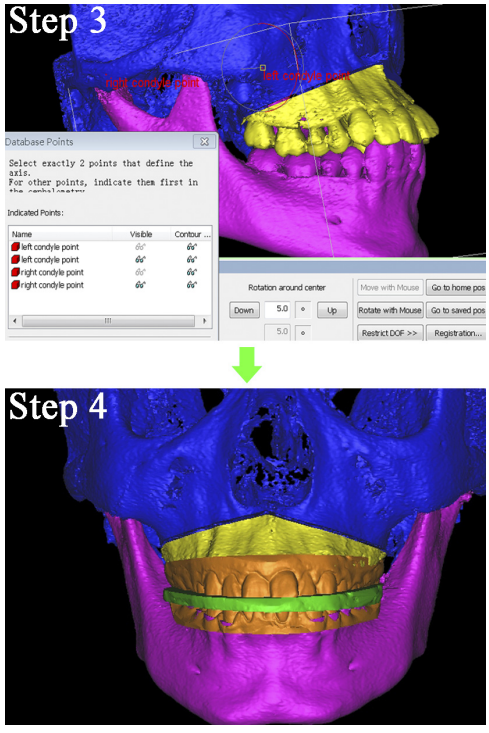

FIGURE 4. Approximately simulating the hinge movement of the mandible to obtain a relatively good position with maxilla and fabricate the virtual intermediate occlusal splint.

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Modern Therapy for Severe Alveolar Ridge Atrophy

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Abstract: This clinical report illustrates a modern method for oral rehabilitation of severe edentulous atrophic ridge. Shallow vestibule and small denture-bearing area of the maxilla provide insufficient retention, and only the symphyseal region of the mandible has

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Received February 2, 2013.
Accepted for publication February 26, 2013.
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The authors report no conflicts of interest.
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ISSN: 1049-2275
DOI: 10.1097/SCS.0b013e3182903129

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obvious alveolar ridge. The surgery of deepening vestibule of the maxilla ridge was done by using tentative miniscrew combined with old denture and soft liner. The osseointegrated dental implants were installed over symphyseal region of the mandible to act as retentive devices for prostheses. In addition, functional reline with rebase material to build buccal-tongue contact over the retromolar area after denture delivery obtained high satisfaction from the patient. Many clinical conditions cannot be managed solely with implants or preprosthetic surgery alone, whereas a combination of the 2 can achieve successful outcome.

Key Words: Implant-retained overdenture, ridge atrophy

The analysis of the state of the art of complete denture prosthesis cannot be adequately discussed by 1 article, because it includes operator technique; philosophical, educational, and political situations; and attitudes of the patient.[1] For severe bony resorption, patients typically have the lowest of expectations for new denture fabrication. As dental implant therapy has become more and more popular, it has now a good option for complete denture wearers.[2–4] On the other hand, the miniscrew is a modern standard orthodontic anchorage therapy in gaining space or correcting crowded teeth.[5,6]

The authors recommend the modern treatment in cases of severe ridge atrophy: the combination of 2 implants between the mental foramina with attachment system overdenture and maxilla preprosthetic surgery with bone screw assists in interim denture fixation.

CLINICAL REPORT

This is a case of a 60-year-old fully edentulous female patient. Physical examination and medical history were unremarkable. The patient's chief complaint was that her old dentures were unstable and not retentive; therefore, she requested new prosthesis rehabilitation.

The patient presented with normal facial symmetry and normal range of mandibular motion with no deviation. The temporomandibular joint, facial, and masticatory muscles were all asymptomatic. The intraoral examination revealed an edentulous maxilla and mandible with severe ridge atrophy. According to Cawood and Howell classification,[7] both atrophy ridges were class VI (Fig. 1).

Graft surgery was suggested to increase osseous support, but the patient refused to receive it because of chances of surgical morbidity and complications, as well as financial limitations.

After discussing the treatment plan with the patient, it was decided that only 2 endosseous implants were to be placed in the symphyseal region of the mandible to retain the complete overdenture, combined with preprosthetic vestibuloplasty.

FIGURE 1. Both maxillary and mandibular alveolar ridges are severely atrophied, with shallow vestibule over the maxilla.

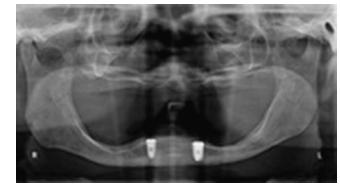

FIGURE 2. Implantation over the mandibular symphyseal area.

SURGICAL TREATMENT

We used her old dentures transformed to a diagnostic and surgical template. The surgical template helped to identify the implant positions and relation of the mental foramen. We placed 2 MIS (Shlomi Industrial Zone, Shlomi, Israel) dental implants (4.2 × 10 mm and 5 × 10 mm) into the intersymphyseal region of the anterior mandible (Fig. 2). The patient was asymptomatic and healed well over the next 3 months. Locater abutment (Zest Anchors, Inc, Escondido, CA) was added to a torque of 30 N · cm 3 months after the implant placement.

For the shallow vestibule of the maxilla, we decide to use an extension procedure (Kazanjian technique[8]) to increase the retention of the dentures. Under local anesthesia, after horizontal incision, we undermined the periosteum and reduction part of the anterior nasal spine, then the vestibular mucosa membrane was sutured to the depth of the periosteum. Her old complete dentures were transformed to the stent. We poured the tissue conditioner (GC soft liner) and overextended the border to avoid the scar reattachment. After that, the denture was fixed by an 11-mm-long miniscrew (Leibinger Universal Fixation System; Stryker, Freiburg, Germany) to the palate (Figs. 3A, B).The stent was removed 2 weeks later.

Prosthetic Procedure

During the postsurgery period, the dentures were adjusted and soft liner changed to increase the patient's life quality. According to Boucher's impression technique, the maxillary and mandible impression technique was made from an individual tray, border molding, and final impression. The implant attachment impression of the locator was used with impression copying and picked up combined with mandibular impression according to the manufacturer's recommendations (Fig. 4). The impression material was polyether material, (Impergum F, 3M ESPE; St Paul, MN). After vertical dimension and centric relation were decided, the anatomic teeth were selected over the upper denture and nonanatomic teeth over the lower denture. The occlusion was designed for lingualized-balancing

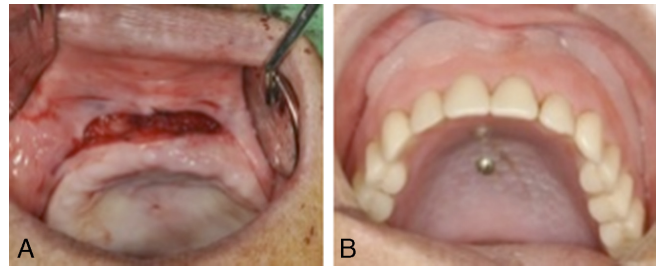

FIGURE 3. Old denture poured with soft liner was fixed over the maxilla as retention surgical stent.

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FIGURE 4. The implant attachment impression of the locator according to the manufacturer's recommendations used impression copying and picked up combined with mandibular impression.

occlusion. After delivery 2 weeks later, the patient had fully adapted to the dentures (Figs. 5–7), although the patient complained about food deposition over the polished surface of the retromolar area. This area was functionally relined with Tokuso rebase II (Tokuyama Corp, Tokyo, Japan) to create buccal-tongue contact (Fig. 8).

Finally, the patient was satisfied with this modern technique as being responsible for improving her chewing efficiency and denture stability.

DISCUSSION

The rate of edentulism increases with age, and studies show that 44% of people 75 years or older are edentulous.[9] Severe atrophy of the alveolar process and underlying basal bone often results in problems. These problems include insufficient retention of the dentures, intolerance loading by the mucosa, pain, difficulties with eating and speech, and loss of soft-tissue support. Furthermore, problems caused by mandibular removable dentures can also result in decreased quality of life.[10,11] These problems are a challenge for both the prosthodontist and surgeon.

Shallow maxilla vestibule depth is responsible for low retention and pain for the patient when wearing dentures. Preprosthetic surgery might be easily performed, but it is not easy to maintain the outcome, especially for edentulism.

Various techniques have been used to extend the labiobuccal vestibule and lingual sulcus to provide an immobile surface for the soft tissue covering the residual alveolar ridge. During the postoperative period, active fixation has better effect, such as by splints or extended dentures fixed to the alveolar ridge with circumferential or transalveolar sutures, by palatal or alveolar screw fixation, by circumnasal floor wiring, or by different types of pins and nails.[12]

Using the miniscrew in dental treatment is more and more popular. In orthodontic treatment, it is called a temporary anchorage device; in oral surgery treatment, it is called a bone screw, miniscrew, or mini-implant. The use of the temporary anchorage device for anchorage has simplified the mechanics of orthodontic treatment and shortened the duration of treatment.

In this case, an old mandibular denture was transformed into a radiographic diagnostic template and a surgical stent for implant surgery. An old maxillary denture was also transformed to a stent for the extension procedure and was fixed by a palatal bone screw. It is an easy method to attain an individual surgical stent without the need for taking an impression and presurgical stent fabrication.

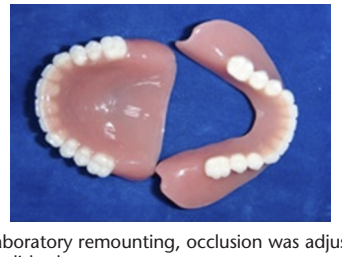

FIGURE 5. After laboratory remounting, occlusion was adjusted. The denture was finished and polished.

FIGURE 6. Locator matrix was selected.

FIGURE 7. The dentures were delivered, and patient was satisfied with the result.

Dental implants have been shown as a reliable basis for fixed and removable prostheses. Reconstructive preprosthetic surgery has changed from surgery aimed to provide sufficient osseous and mucosal support for a conventional denture into surgery aimed to provide sufficient bone volume enabling implants to be placed at the most optimal positions from a prosthetic point of view.

For patients who present a severe atrophic ridge as well as limited grafting options and/or limited financial means, the ideal method would be to place endosteal implants in the anterior mandible between the mental foramina. Then, an overdenture can be fabricated with attachments and tissue support.[4,13]

Using 2 dental implants with locator attachments, a mandibular overdenture was fabricated with sufficient retention and stability.[14] This improved the patient's life quality.

CONCLUSIONS

This report demonstrates the successful use of the miniscrew for preprosthetic surgery to extend the maxillary insufficient vestibule and endosteal implants together with a locator attachment to improve retention and stability of the lower denture. Using conventional complete denture technique as a base along with modern

FIGURE 8. After 2 weeks, the patient complained about food deposition over the polished surface of the retromolar area. Functional reline was performed over the polished surface of the retromolar area to create the buccal-tongue contact and reduce food deposition.

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implant therapy would increase the patient's good stability, retention, and satisfaction.

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Management of Pure Medial Orbital Wall Fracture With Autogenous Bone Graft

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Abstract: The orbit is an irregular conical cavity formed from 7 bones including the frontal, sphenoid, zygomatic, maxillary, ethmoid, lacrimal, and palatine bones. Fractures of the internal orbit can cause a number of problems, including diplopia, ocular muscle entrapment, and enophthalmos. Although muscle entrapment is relatively rare, diplopia and enophthalmos are relatively common sequelae of internal orbital fractures. Medial orbital wall fracture is relatively uncommon and represents a challenge for its anatomical reconstruction. In this context, autogenous bone graft has been the criterion standard to provide framework for facial skeleton and orbital walls. Therefore, it is possible to harvest grafts of varying size and contour, and the operation is performed through the bicoronal incision, which is the usual approach to major orbital reconstruction. Thus, this article aimed to describe a patient with a pure medial orbital wall fracture, and it was causing diplopia and enophthalmos. The orbital fracture was treated using autogenous bone graft from calvarial bone. The authors show a follow-up of 12 months, with facial symmetry and without diplopia and enophthalmos. In addition, a computed tomography scan shows excellent bone healing at the anterior and posterior parts of the medial orbital wall reconstruction.

Key Words: Bone graft, diplopia, enophthalmos, orbital fracture, medial orbital wall fracture, surgical management

Trauma to the orbital region can result in considerable facial deformity. Orbital fractures are very common in facial injuries, which usually occur in zygomatic-orbital fractures, or as part of panfacial injuries. In this context, injury to the medial orbital wall is relatively uncommon. Medial orbital fractures represent only 4% of all orbital fractures, which usually result from blunt trauma.[1] Medial orbital wall fractures may occur in isolation or in combination with more complex fractures of the skeletal framework.[2]

The indications for surgery on medial orbital wall fractures are controversial.[3] There is general agreement that lack of ocular motility is an important consideration. The most commonly accepted cause for limited motility is entrapment of the extraocular muscles into a fracture gap in the orbital wall. Therefore, strong indications for orbital reconstruction include significant disturbance of eye motility, diplopia, and enophthalmos, in which this last indication is usually a sign of a large orbital wall defect.[4]

The material of choice for orbital wall reconstruction has also been controversial. There is general agreement that the ideal material for repairing the orbital wall should be rigid enough to support the orbital contents and should restore the original orbital volume and contours of the internal orbit.[3,4] Many surgical materials have been used to reconstruct the orbit. Autogenous bone graft has been the criterion standard to provide framework for facial skeleton and orbital walls. Therefore, this article aimed to describe a patient with a large medial orbital wall fracture, which was reconstructed using autogenous bone graft from calvarial bone. The authors show a

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Received February 6, 2013.
Accepted for publication March 2, 2013.

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The authors report no conflicts of interest.

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ISSN: 1049-2275
DOI: 10.1097/SCS.0b013e318290330a

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