Post-Traumatic Implant-Supported Restoration of the Anterior Maxillary Teeth Using Cancellous Bone Block Allografts

Joseph Nissan, DMD, Ora Gross, DMD,†*
Ofer Mardinger, DMD,‡ Oded Ghelfan, DMD,§
Roberto Sacco, DDS,‖ and Gavriel Chaushu, DMD, MSc¶

Purpose: To prospectively evaluate the outcome of dental implants placed in the post-traumatic anterior maxilla after ridge augmentation with cancellous freeze-dried block bone allografts.

Materials and Methods: Patients presenting with a history of anterior dentoalveolar trauma with bony deficiencies in the sagittal (≥3 mm) and vertical (<3 mm) planes according to computed tomography were included. The recipient sites were reconstructed with cancellous bone block allografts. After 6 months of healing, implants were placed. The primary outcomes of interest were *1)* bone measurements taken before grafting, at the time of implant placement, and at stage 2 operations; *2)* implant survival; and *3)* complications.

Results: The sample was composed of 20 consecutive patients with a mean age of 25 ± 7 years. We used 28 cancellous allogeneic bone blocks, and 31 implants were inserted. Of the 31 implants, 12 were immediately restored. The mean follow-up was 42 ± 15 months. Graft and implant survival rates were 92.8% and 96.8%, respectively. Mean bone gain in the sagittal and vertical planes was 5 ± 0.5 mm horizontally and 2 ± 0.5 mm ($P < .001$). Successful restoration was achieved in all patients with fixed implant-supported prostheses. Soft tissue complications occurred in 7 patients (35%). Complications after cementation of the crowns were seen in 3 implants (9.6%). All implants remained clinically osseointegrated at the end of the follow-up examination. There was no crestal bone loss around the implants beyond the first implant thread.

Conclusion: Cancellous block allograft can be used successfully for post-traumatic implant-supported restoration in the anterior maxilla.
© 2011 American Association of Oral and Maxillofacial Surgeons
J Oral Maxillofac Surg 69:e513-e518, 2011

The post-traumatic anterior maxilla is a challenging area for both the surgeon and prosthodontist. Most of the patients are young with high esthetic demands. Adequate bone volume and soft tissue volume are therefore mandatory. Unfortunately, in many cases dental trauma is accompanied by a loss of either bone or soft tissue (or both).[1,2] Moreover, post-traumatic bone and soft tissue scarring combined with vascular compromise adds to the complexity of an esthetic implant-supported restoration in the future. The pa-

*Senior Lecturer, Department of Oral Rehabilitation, The Maurice and Gabriela Goldschleger School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel.

†Instructor, Department of Oral Rehabilitation, The Maurice and Gabriela Goldschleger School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel.

‡Lecturer, Department of Oral and Maxillofacial Surgery, The Maurice and Gabriela Goldschleger School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel.

§Instructor, Department of Oral Rehabilitation, The Maurice and Gabriela Goldschleger School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel.

‖Resident, Department of Odontostomatology, Faculty of Medicine, University of Sassari, Sassari, Italy.

¶Associate Professor, Department of Oral and Maxillofacial Surgery, The Maurice and Gabriela Goldschleger School of Dental Medicine, Tel Aviv University, Tel Aviv, Israel.

Address correspondence to Dr Nissan: Department of Oral Rehabilitation, School of Dental Medicine, Tel Aviv University, 4, Klackin St, Tel Aviv, Israel; e-mail: nissandr@post.tau.ac.il
© 2011 American Association of Oral and Maxillofacial Surgeons
0278-2391/11/6912-0017$36.00/0
doi:10.1016/j.joms.2011.08.002

tients' young age prevents immediate treatment in many cases. As a result, resorption and atrophy of the anterior maxilla are enhanced, leading to difficulties of implant treatment with a possible contribution to early implant failure in the post-traumatic anterior maxilla.[3]

Therefore preimplant augmentative surgery is a prerequisite in many cases in the post-traumatic anterior maxilla.[4-6] Autogenous bone harvested from either extraoral or intraoral sites is still the gold standard in post-trauma cases.[2,7] The graft must possess strength and rigidity to allow its fixation in the recipient site and 3-dimensional stability to withstand muscular forces.[8] Consequently, an autogenous block graft is often recommended in the post-traumatic anterior maxilla.[2] Recent studies suggest that a block allograft in conjunction with a resorbable membrane may be an acceptable alternative to the autogenous block graft in the treatment of compromised alveolar ridges.[9-14] The incentive for using block allografts in post-traumatic cases in young patients already having trauma is to avoid donor-site morbidity.[15,16] Otherwise, such patients may decline initial treatment, resulting in an even more compromised alveolar ridge.

The aim of this study was to prospectively evaluate the outcome of dental implants placed in the post-traumatic anterior maxilla after ridge augmentation with cancellous freeze-dried block bone allografts.

Materials and Methods

Patients were selected after a meticulous evaluation of their medical histories and dental examinations that included panoramic, orthoradial periapical radiographs and dental computed tomography (CT) scans. A history of anterior dental trauma and a bony deficiency of at least 3 mm sagittally and up to 3 mm vertically according to CT para-axial reconstruction served as inclusion criteria. Postoperative panoramic and orthoradial periapical radiographs were taken to compare with the preoperative radiographs. All procedures were fully explained to the patients, and the Ethics Committee of Tel Aviv University, Tel Aviv, Israel, approved the study protocol.

A staged approach was planned to reduce potential complications (wound dehiscence, block graft fracture, implant loss) that have been associated with simultaneous grafting and implant placement.[10]

One hour preoperatively, oral antibiotics were administered, comprising 1,000 mg of amoxicillin (Moxypen Forte; Teva Pharmaceutical, Petach Tikva, Israel) and 600 mg of etodolac (Etopan; Taro Pharmaceutical Industries, Haifa Bay, Israel). Antiseptic mouthwash, 0.2% chlorhexidine gluconate (Tarodent; Taro Pharmaceutical Industries), was used immediately before surgery.

With the patient under local anesthesia (infiltration by use of 2% lidocaine with 1:100,000 epinephrine), surgery commenced at the recipient site to confirm the shape and size of the defect as previously seen on the CT para-axial reconstruction. The prepared allograft was rehydrated with a solution of sterile saline for at least 45 minutes. Freeze-dried cancellous block allograft (ReadiGraft and Canblock 1.5, LifeNet, Virginia Beach, VA) was shaped with a fissure bur in a high-speed handpiece with copious irrigation. The endpoint was a block graft that closely approximated the recipient bed and provided adequate width and height to accomplish the restorative treatment plan. The graft was then thoroughly rinsed with sterile saline solution to remove residual bone particles.

A midcrestal incision based on the missing teeth was made. The incision was extended in an intrasulcular manner around the cervical margins of the adjacent teeth up to the canines. Two vertical releasing incisions were made on the labial aspect distal to the canines, away from the recipient site, to include the papilla between the canine and the first premolar. The vertical releasing incisions were thus extended away from the esthetic zone into the mobile mucosa. The buccal aspect of the alveolar ridge was then exposed to allow 3-dimensional visualization of the defect (Fig 1).

Several modalities can be applied to ensure the broadest communication possible between grafted bone and the bone marrow cavity. The most frequent technique used is multiple perforations, made through the cortical plate with a round bur. Because the cases presented after trauma, with negligible buccal cortical bone, they were left as is without any preparation.

The cancellous block graft was refined to fit into the defect. Once the graft was seated and stable, it was fixed with 1.6 × 10–mm bone screws (OsteoMed, Addison, TX) (Fig 2). A high-speed, water-cooled, large round bur was used to round the sharp cortical edges and shape it to completely conform to the defect site. Measurements of the initial and post-augmentation ridge width and height were taken with periodontal probes scaled in millimeters to assess bone gain. Deficiencies at the edges of the graft were filled with particulate bovine bone mineral (Bio-Oss; Geistlich Biomaterials, Wolhusen, Switzerland). A resorbable membrane (Ossix; OraPharma, Warminster, PA) was used.

Periosteal releasing incisions were made. The midcrestal incision was initially closed with interrupted or horizontal mattress sutures as needed. The interdental papillae and the vertical incisions were secured with interrupted sutures. We prescribed 500 mg of amoxicillin (Moxypen Forte; Teva Pharmaceutical) 3 times daily and 600 mg of etodolac (Etopan; Taro

Download English Version:

https://daneshyari.com/en/article/3154435

Download Persian Version:

https://daneshyari.com/article/3154435

Daneshyari.com