John Ley, DDS, Editor

ENDOSSEOUS IMPLANTS

"Systemic Review of Survival Rates for Immediately Loaded Dental Implants," by M. Fabbro, T. Testori, L. Francetti, et al. Int J Periodontics Restorative Dent, 26:249–263, 2006.

This paper reviews the literature to determine the survival rate of immediately loaded implants (ILIs) and to elucidate the various factors that may affect ILI success. The authors conducted a thorough review of the literature. Articles included in this review contained at least 10 patients or 20 implants treated; loading applied within 48 hours of placement; follow-up at 12 months or later; less than 5% dropout rate; and proper reporting of implant number, failures, and survival rates. The authors obtained data from each study and applied statistical analysis. A total of 71 articles met the inclusion criteria. Mandibular overdentures treated with ILIs demonstrated a survival rate of 95.13%. The majority of these were rough-surfaced implants. Of the full-arch prostheses treated with ILIs, the survival rates were 97.25% in the mandible and 98.24% in the maxilla. Rough-surfaced implants performed significantly better than machined-surfaced implants. Mandibular fixed partial dentures (FPDs) treated with ILIs had a survival rate of 95.83%. Rough-surfaced implants had a higher success rate in the posterior mandible but not in the anterior mandible. The success rate in the maxillary FPDs was 93.47%. There was a higher success rate for rough-surfaced implants in the posterior maxilla but not in the anterior maxilla. For single-tooth ILIs, the survival rates were 97.57% in the mandible and 96.19% in the maxilla. The survival rate for rough-surfaced single-tooth ILIs in the posterior mandible was greater than that for machined-surfaced ILIs in the posterior mandible but not in the anterior mandible or the maxilla. There was no significant difference in the survival rates between single-tooth ILIs placed in fresh extraction sockets and those placed in healed ridges. The majority of implant failures occurred during the first 6 months of loading. The conclusions of this study were that ILIs are well studied in the edentulous mandible, rough-surfaced implants may improve success, and careful patient selection may increase success. The authors also state that further study is needed to compare the success of ILIs vs conventional loading.

BONE PHYSIOLOGY

"Safety of Oral Bisphosphonates: Controlled Studies on Alveolar Bone," by M. Jeffcoat. Int J Oral Maxillofac Implants, 21:349–353, 2006.

This article reports on 2 controlled studies on oral bisphosphonates. The first study examined the effects of a single weekly dose of alendronate (compared with placebo) on periodontal bone loss. A total of 353 patients who had moderate to severe periodontitis were included in the study. The patients were treated for 2 years. Alendronate had a positive effect with reduced bone loss in patients with low bone density before treatment. No cases of osteonecrosis of the jaw (ONJ) were reported. The second study included 25 implant patients (102 implants) who received oral bisphosphonates for 1 to 4 years before implant treatment and 25 age-matched patients who received 103 implants but had not taken oral bisphosphonates. All patients were followed for at least 3 years after implant placement. There was no significant difference in the implant success rates between the 2 groups. There were no cases of ONJ. The results of these studies suggest that oral bisphosphonates did not increase the risk of ONJ and that the use of oral bisphosphonates may positively affect the alveolar bone in patients with low bone density. Oral bisphosphonate use did not appear to affect implant success or complications.

"Editorial: A Time for Perspective on Bisphosphonates," by L. Assael. J Oral Maxillofac Surg, 64:877–879, 2006.

This editorial, based on a presentation given to patients in a myeloma support group, was written to discuss the current knowledge of bisphosphonate use and its relation to osteonecrosis of the jaw (ONJ). The author starts with an analysis of bisphosphonates and ONJ. The action that bisphosphonates have on the jaws is not known. Osteonecrosis of the jaw does not appear to be related to microorganisms in any significant way. The effects of smoking, diabetes, and other systemic disorders on ONJ are not known. One half of patients with ONJ also have myeloma. The appearance of osteonecrosis seems to be limited to the jaws. There is commonly significant pain associated with ONJ. The dose, type of bisphosphonate, and route of administration all appear to have role in the development of ONJ. The author concludes with 8 ''take home'' messages to these patients (eg, bisphosphonates play a useful role in treating bone disease and help prevent pain and fractures).

There are 2000 cases of ONJ reported to the US Food and Drug Administration. Tooth extraction is often the precipitating event in ONJ; thus, avoiding extraction is advised. Patients who use bisphosphonates are advised to seek regular dental care. The major risk factors for ONJ include metastatic breast cancer, multiple myeloma, osteoporosis, history of bisphosphonate use, concurrent chemotherapy, poor dental health, and smoking. This editorial may prove to be a useful handout for patients undergoing bisphosphonate treatment and chemotherapy.

SOFT TISSUE GRAFTING

"Comparison of Acellular Dermal Graft and Palatal Autograft in the Reconstruction of Keratinized Gingival Around Dental Implants: A Case Report," by J-J. Yan, A. Tsai, M-Y. Wong, L-T. Hou. Int J Periodontics Restorative Dent, 26:287–292, 2006.

This paper presents a case study of using acellular dermal matrix (ADM) and autogenous free gingival graft (FGG) to increase the zone of keratinized tissue adjacent to root-form implants. A patient presented with implants in both the anterior maxilla and mandible. Each area was deficient in the amount of keratinized tissue on the labial of the implants. A combined vestibuloplasty and free soft tissue graft was performed in both areas. The recipient bed was created with a split thickness flap repositioned and sutured apically. All tissue tags and muscle fibers were removed from the periosteal bed. In the maxilla, the area was grafted with tissue obtained from the palate (FGG). The mandibular site was grafted with ADM. Both grafts were fixed with periosteal sutures. The patient was instructed to rinse with 0.12% chlorhexidine mouth rinse and to not brush the area for 6 weeks. The FGG graft healed uneventfully, with complete maturation 3 months postoperatively. The ADM also healed uneventfully but at a slower rate compared with the FGG. In addition, the ADM experienced greater shrinkage during healing. The ADM demonstrated better integration with the surrounding tissues and had less of a patchlike appearance compared with the FGG. These results suggest both the ADM and the FGG are effective at increasing the zone of keratinized tissues around dental implants. Which technique is more effective remains to be seen.

IMPLANT PROSTHODONTICS

"Implant-retained Mandibular Overdentures Versus Conventional Dentures: 10 Years of Care and Aftercare," by A. Visser, H. Meijer, G. Raghoebar, A. Vissink. Int J Prosthodont, 19: 271–278, 2006.

This paper presents the results of a randomized, prospective study that compared the treatment outcomes of patients treated with various methods for the completely mandibular edentulous arch. One hundred fifty-one edentulous patients with mandibular symphyseal bone height of 8 to 25 mm were included in the study. Sixty-two patients were treated with 2 root-form implants in the symphysis region supporting an overdenture. Fifty-nine patients were treated with conventional mandibular dentures. The remaining 30 patients had a conventional denture on a ridge treated by preprosthetic vestibuloplasty. Patients who received conventional dentures could choose implants after 1 year of treatment. The treatment methods were compared for amount of surgical and prosthetic care and aftercare. After 10 years, 133 patients completed the study. Of the patients with complete dentures, only 44% switched to implant overdentures. Only 16% of those with a conventional denture and vestibuloplasty switched to implant overdentures. Implant overdentures required more care and aftercare compared with the conventional dentures. Patients with implant overdentures had a greater satisfaction recorded. These results suggest that mandibular implant overdentures, though more satisfying to patients, require more maintenance visits compared with their conventional counterparts.

"Clinical Evaluation of 3 Overdenture Concepts With Tooth Roots and Implants: 2 Year Results," by S. Hug, D. Mantokoudis, R. Mericske-Stern. Int J Prosthodont, 19:236–243, 2006.

This paper compares the efficacy of overdentures retained by roots, implants, or a combination of the two. The patients were categorized into 3 groups according to retention from roots, implants, or a combination of the two and were matched by age, sex, treatment time, and observation period. The follow-up period was 2 years for all groups. The combination group contained a low number of roots or an asymmetric distribution of roots such that each patient received at least 1 implant to enhance stability of an overdenture. In all groups, maxillary and mandibular overdentures were included. The connection to the overdentures varied and included individual attachments and bars. The patients were compared for clinical, radiographic, and subjective satisfaction. In addition, complications and maintenance were tabulated. The results indicated that 1 root failed in the combination group and 1 implant failed in the implant-only group. Bone loss was 0.8 ± 1.1 mm around the implants and 0.3 ± 0.9 mm for the roots. All 3 groups had significantly more complications in the first year compared with the second year. The root-only group had significantly more complications compared with the other 2 groups. The root and

combination groups registered increased dissatisfaction in several parameters, including general satisfaction, compared with the implant-only group. The combination-group initial costs were 10% lower compared with the implant-only group. These results suggest that combining implants and roots can be as successful as implant or root-only overdentures.

"Preloads Generated With Repeated Tightening in Three Types of Screws Used in Dental Implant Assemblies," by D. Byrne, S. Jacobs, B. O'Connell, F. Houston, N. Claffey. J Prosthodont, 15:164–171, 2006.

This study examines the effect of repeated tightening of abutment screws on the preload. Preload is a term that defines the tension generated in a screw when it is tightened and relates to the clamping force the screw has on an abutment. Three different screws were studied: titanium alloy screws, gold alloy screws, and gold alloy screws coated with gold. Two different abutments were used for the study: prefabricated and cast. The screw preloads were tested by using an assembly set up on a workbench. The screws were tightened through 3 consecutive cycles of tightening to 10, 20, and 35 Ncm. Ten screws of each type were studied. The results indicated that all screws lost preload with repeated tightening. The gold-coated screws generated the greatest preload throughout the test period. Despite this, the gold-coated screws experienced the most loss in preload with repeated tightening, followed by the gold screws. The preload with the titanium screws did not dissipate with repeated tightening. These results suggest that the gold-coated screws have the best preload but work best with minimal manipulation. Titanium screws do not seem to lose preload with repeated tightening.