

IMPLANT PROSTHODONTICS

"Two-Implant-Supported Single Molar Replacement: Interdental Space Requirements and Comparison to Alternative Options," by T. J. Balshi and G. J. Wolfinger. *Int J Periodont Restor Dent* 17:427-435, 1997.

Posterior single-tooth implant restorations are subjected to an increased risk of torque on the implant-abutment system. A high incidence of implant fracture has been reported when using a single, standard 3.75-mm-diameter implant to support a molar restoration. In this retrospective study of 60 molar sites, with teeth present mesial and distal to the site, the authors found that two standard 3.75-mm-diameter implants could be placed when there was as little as 10 mm of space between the remaining teeth. The advantages reported include a significant increase in surface area (almost 40% more than a single 6-mm-wide-diameter implant), much less screw loosening, elimination of torque due to a cantilever prosthesis, increased resistance to buccal-lingual forces, and the ability to facilitate adequate home care. The slightly increased incurred by the second implant is not significant in comparison to the many advantages. (F. DuCoin)

"Alumina-Zirconia Machinable Abutments for Implant-Supported Single-Tooth Anterior Crowns," by M. Sadoun and S. Perelmuter. *Pract Periodont Aesthetic Dent* 9:1047-1053, 1997.

Innovative materials and techniques are constantly being developed in the search for improved implant restorations. This article describes a new material and the fabrication process of aesthetic, machinable, ceramic, anterior

implant abutments. The material is a mixture of aluminum oxide, cerium oxide, and zirconium oxide used to fabricate a core by ceramic injection and a presintering process. This core can then be easily machined to produce a custom abutment that is then hardened by a glass infiltration process. The ceramic abutment can be secured to the implant with a torque of 20 Ncm. A large diameter (3 mm) titanium abutment screw is used to help distribute the compressive force on the ceramic abutment. Further modifications can be made with a diamond burr fitted in a high-speed handpiece. The final prosthesis is cemented to the abutment. This abutment material has been used by the authors in 28 cases of anterior single crowns on implants over the past 4 years without any incidence of screw loosening or abutment structural failure. More studies need to be completed to discover the *in vivo* mechanical fatigue, finite element analysis, and long-term follow-up findings of a larger number of clinical cases before the true efficacy of this new material will be known. (F. DuCoin)

"Prosthetic Consideration in the Fabrication of Surgical Stents for Implant Placement," by A. Sadan, A. J. Raigrodski, and T. J. Salinas. *Pract Periodont Aesthetic Dent* 9:1003-1011, 1997.

The use of surgical stints or templates for implant placement is important to the success of the implant-supported prosthesis. Major conceptual differences exist between surgical stints designed for implant supported single crowns and bridges and those designed for implant-supported overdentures. There are also many types of stint designs within each group. Opti-

mizing the prosthetic result begins with careful consideration of the specific stint used in each particular case. This informative article reviews various stint designs, gives indications for their proper use, and provides decision flow charts to help facilitate selecting the most appropriate design for specific situations. (F. DuCoin)

BASIC SCIENCE AND RESEARCH

"Morphostructural Relationships Between Bone and Implant: Comparative Analyses by Optical Microscopy and Microradiography," by A. E. Bianchi, G. Gallini, R. Fassina, F. Sanfilippo, and D. Zaffe. *Int J Periodont Restor Dent* 17:553-561, 1997.

This study assessed the relationship between the surfaces of a hollow cylindrical titanium implant and the consequent bone organization around it. A human maxillary bone specimen was taken that enclosed an implant that had lasted 28 months under prosthetic function. The implant was removed because of a fracture of the abutment screw that prevented the implant from being used to support the new prosthesis. The bone was block sectioned, fixed, embedded, and analyzed using three different histologic analyses: optical microscopy under light, optical microscopy under polarized light, and microradiography. The data from this study demonstrated the presence of woven bone in the bone layer adjacent to the external surface of the implant. The authors assert that this finding demonstrates the importance of woven bone as a holding sheath in the immediate postsurgical stage and as a mold for the subsequent lamellar bone. (F. DuCoin)