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Preface Mark V. Thomas

Implant Surfaces

David A. Puleo and Mark V. Thomas

Available in many shapes, sizes, and lengths, dental implants are also crafted from different materials with different surface properties. Among the most desired characteristics of an implant are those that ensure that the tissue-implant interface will be established quickly and then will be firmly maintained. Because many variables affect oral implants, it is sometimes difficult to reliably predict the likelihood of an implant's success. It is especially difficult to assess whether the various modifications in the latest implants deliver improved performance. This article focuses primarily on important surface characteristics and their potential effects on the performance of dental implants.

Consequences of Implant Design

Archie A. Jones and David L. Cochran

The use of dental implants to replace missing teeth is becoming a preferred alternative for restorative dentists and their patients. There are two general surgical approaches for the placement and restoration of missing teeth using endosseous dental implants. One approach places the top of the implant at the alveolar crest and the mucosa is sutured over the implant. An alternative approach places the coronal aspect of the implant coronal to the alveolar crest and the mucosa is sutured around the transmucosal aspect of the implant. This article reviews one-piece and two-piece implants as well as biologic implications of submerged and nonsubmerged surgical techniques for placing implants.

Risk Factors for Endosseous Dental Implant Failure

David W. Paquette, Nadine Brodala, and Ray C. Williams

Failures of endosseous dental implants are rare and tend to cluster in patients with common profiles or risk factors. Clinical trials indicate that factors related to implant devices, anatomy, occlusion, systemic health or exposures, microbial biofilm, host immunoinflammatory responses, and genetics may increase the risk for implant complications or loss. In general, factors associated with the patient appear more critical in determining risk for implant failure than those associated with the implant itself. Several risk factors can be modified. For example, the patient can modify smoking and the clinician can modify implant selection, site preparation, and loading strategy. In identifying these factors and making appropriate interventions, clinicians can enhance success rates while improving oral function, esthetics, and patient well-being.

The Immediate Placement of Endosseous Dental Implants in Fresh Extraction Sites

Jay R. Beagle

The use of endosseous dental implants to rehabilitate both fully and partially edentulous patients has been peer-reviewed in the literature for more than 25 years. Cumulative success rates for the treatment of partial edentulism with dental implants has been reported as 96% in delayed or late-placement sites. Recently, significant attention has been given to the placement of implants in fresh extraction sites to avoid such potential concerns as bone resorption, multiple surgical procedures, increased treatment time, and unsatisfactory esthetics. This article discusses the salient aspects of immediate dental implant placement from a historical, histologic, and clinical perspective, and describes the surgical methods for this procedure.

Implants in the Esthetic Zone

Mohanad Al-Sabbagh

To achieve a successful esthetic result and good patient satisfaction, implant placement in the esthetic zone demands a thorough understanding of anatomic, biologic, surgical, and prosthetic principles. The ability to achieve harmonious, indistinguishable prosthesis from adjacent natural teeth in the esthetic zone is sometimes challenging. Placement of dental implants in the esthetic zone is a technique-sensitive procedure with little room for error. Guidelines are presented for ideal implant positioning and for a variety of therapeutic modalities that can be implemented for addressing different clinical situations involving replacement of missing teeth in the esthetic zone. 375

Maxillary Sinus Augmentation

Paul S. Tiwana, George M. Kushner, and Richard H. Haug

Attention to the principles of bone grafting, bone healing, and maxillary sinus physiology as well as anatomy is critical to the successful placement of dental implants in the posterior maxilla. The integration of these principles must take into account the restorative dental requirements and the patient's autonomy in guiding implant reconstruction. As in so many clinical disciplines, additional research is needed to provide better guidance for clinicians. Despite some gaps in our knowledge, however, sinus augmentation procedures have proven to be safe and effective and have permitted the placement of implants in sites that would have otherwise been impossible to treat. This article summarizes techniques and technologies related to maxillary sinus augmentation.

Implant Anchorage in Orthodontic Practice: The Straumann Orthosystem

Mark V. Thomas, Terry L. Daniel, and Thomas Kluemper

Dental implants have been used to provide orthodontic anchorage. This article provides an overview of the Straumann Orthosystem implant system (Institut Straumann, Waldenburg, Switzerland) and its application, including the anatomy of the bony palate and contiguous structures. Considerations in placement of the Orthosystem implant include the avoidance of contiguous anatomic structures such as the nasal cavity, the degree of ossification of the palatal suture, and the quality and quantity of bone in the proposed implant site, all of which are discussed in this article.

Simplified Impression Technique for Implant-Supported Crowns

James E. Haubenreich and Fonda G. Robinson

Dental implants have become a widely accepted method for replacing missing teeth. While many oral surgeons and periodontists are actively involved in the surgical placement of dental implants, many general dentists do not perform such placements because they are intimidated by the seeming complexity of the procedures and hardware. In response to perceived complexity, dental implant manufacturers have developed implant systems that facilitate and simplify impression taking. As such simplified protocols become more common, implant-borne restorations will become more widely used by the profession as a routine treatment modality. This article describes a simple technique for restoring a single-tooth posterior Straumann implant. 439

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Evidence-Based Decision-Making: Implants Versus Natural Teeth

Mark V. Thomas and Jay R. Beagle

The clinician is increasingly confronted with the dilemma of whether to use implants or so-called "traditional" dental interventions. Given the high predictability of implants, their use should be considered routine. The survival and success rates reported by many investigators often exceed the success rates of some forms of heroic treatment. Findings from well-designed trials must be used to guide clinical decision-making. In this article, the authors review studies of outcomes related to one particular implant system and compare these results to those reported for various forms of endodontic therapy and tissue-supported mandibular complete dentures. The results suggest that implant restorations of the system in question have a level of predictability equal to or greater than that for traditional dental treatment.

Implant Maintenance

Sue Humphrey

Endosseous root-form implants have become an integral part of dental reconstruction in partially and fully edentulous patients. The long-term prognosis of an implant is related directly to routine assessment and effective preventive care. To maintain healthy tissues around dental implants, it is important to institute an effective maintenance regimen. Different regimens have been suggested, but it is unclear which are the most effective. This article evaluates the literature regarding implant maintenance. Factors affecting the soft tissue surrounding endosseous root-form implants are discussed, and procedures for assessment of the implant and the treatment of reversible disease in implant maintenance are outlined.

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