



American Association of Oral and Maxillofacial Surgeons
2013 Dental Implant Conference

December 5-7, 2013 ♦ Sheraton Chicago Hotel & Towers

G03: Complications

12/7/2013

8:00AM - 4:30PM

***Prosthetic Complications on Implants: Thirty year
Follow-up of Prosthetic Complications on Implant
and Dental Restorations***

by

Dr. Roy Yanase

WARNING: Consider file size/number of pages before printing.
We recommend saving this document to your device, if possible.

AAOMS G03 December 7, 2013 Prosthetic Complications on Implants
Hand - out for Lecture
Roy T. Yanase, D.D.S.
22330 Hawthorne Boulevard, Suite 316
Torrance, CA 90505

30 Year Follow-up of Preprosthetic Complications, Implants, and Dental Restorations: Surgical and Mandibular Subperiosteal Implants to Osseointegration

Osseointegration has provided prosthetic dentistry with an excellent protocol that has changed the paradigms for treating the totally and partially edentulous patients.^{i , ii , iii , iv , v}

With over 35 years of surgical and prosthetic literature, a significant amount of studies have been written about implant success to help the clinician providing everyday treatment with osseointegrated implants as a significantly more successful option to conventional definitive prostheses in all parts of the human skeleton.

Complications with Implants^{vi}

Restorative material complications differ from prosthetic complications in that prosthetic complications involve the implant and the prostheses and while altering or replacement of the restorative material often can solve the complications for the prosthesis, an implant complication often involves the prosthesis as well. Provisional, functional, and esthetic considerations enter into the equation as complications are solved.

Implant involved complications can be divided into esthetic, phonetic, biologic, mechanical, and functional categories. Purely Restorative complications may refer to the esthetic, phonetic, and mechanical aspects of prosthesis fabrication. Combining the surgical and restorative considerations in treatment planning results in design of the definitive prosthesis. Prosthodontic complications however can include the combination of patient mediated factors as well as bio-mechanical^{vii}, bio-functional, and bio-physiological factors that require both implant and restorative principles to provide long term success with implant supported restorations. A truly informed patient should have discussed the successes and complications that can be expected prior to making an informed decision that included time and longevity estimates for the proposed options for a definitive prosthesis.

Prosthetic complications may be Implant System specific depending on marketing efforts, scientific guidelines, and design of the implants. Guidelines regarding the loading of the prostheses have changed. In 1985, a prosthesis was fabricated to maintain an osseointegrated implant(s) that followed a strict two-stage surgery and three or six month protocol. Today, with various immediate and delayed immediate loading concepts, certain predictors can determine the stability of the implant that could guide the early loading of an implant with strict attention to minimize the damaging micro-movement of the implant completing its initial stages of osseointegration.^{viii} This may require an interim restoration during the time required for osseointegration to continue healing and the remodeling process to help prevent the complications of early loading, i.e. Irregular bone loss, alveolar fenestrations, loss of adjacent papilla, and failure of distance osteogenesis completing the expected healing of bone to the anticipated levels.

The complications reported in the literature can vary from requiring simple corrections to totally new restorations and are, for the most part, being investigated and attempts for prevention developed. The highest rates of complications reported are associated with removable prostheses and overdentures that require more adjustments and material fatigue and clinical wear.^{ix} Fracture of implants, screws, and restorative materials have been addressed with new designs of screw joints and the understanding of fit, preload, and materials specifically solve previous concerns.^{x,xi} With the introduction of evidence supporting the utilization of overdentures as a first option of choice for the totally edentulous patient, the fact of more adjustments and time in future repairs and adjustments is a concern unless specific guidelines for adjustment less prostheses are also included for the guidelines soon to be published.^{xii}

New computer technologies impact the entire process from diagnostic imaging, surgical guide fabrication, CAD CAM abutment design and framework milling, restoration manufacture and even shade matching of the prosthesis. Implant prosthodontics has made significant progress in some areas and continued observation can improve the technical, esthetic, and functional success of implant supported restorations.^{xiii} Thus the date for complications could reflect past problems that may not be as relevant today or tomorrow.^{xiv} At this point in time, computer software can be modified to be compatible with all of the computers. Minor incompatibilities between

current hardware and software do not allow absolute accuracy in CAD/CAM surgical and prosthetic procedures.

Insignificant complications;

There are observations associated with implant restorations that require further long-term follow-up and investigation to explain certain phenomena for long term success. Because of the insignificant incidence of certain phenomena, many therapists many never experience the complications or observe them due to not participating in the fixed or removable prosthetic prostheses. Many have heeded the advice of early experiences to avoid the procedures that were identified in the early complications, And many patients fall away form regular and diligent recall efforts to study large populations of patients to indicate significant long-term observations.

Supportive Professional Implant Maintenance – Recall Program

There will be future prosthodontic complications that can only be observed over time and remain without scientific explanation and deserve further investigation. Mandibular Osteogenesis^{xv} following prosthetic loading and observations of tooth and implant migration^{xvi} are prosthodontic phenomena that do not have universal agreement on etiology, predictability, prevention, or management.

Personal experiences with peri-implantitis and mucositis require that implant patients be considered at risk. With the increase universally of rough implant surfaces, the use of dental cements for crowns rather than screws for retention, combined with the increase of polypharmacy and subsequent xerostomia, it is essential that a well-supervised supportive maintenance schedule be established for each patient. Oral Microbial Control and Management of Periodontal Pathogens have been combined with CAMBRA principles and clinical protocols.

REFERENCES

ⁱ International College of Prosthodontists “Consensus report on the current status of implant prosthodontics” Zarb G, ed. Int J Prosthodont 1990;3:11-51.

ⁱⁱ The Academy of Prosthodontics Symposium “Towards optimized management of the edentulous predicament.” Zarb G, ed. J Prosthet Dent 1998;79:1-105.

- iii University of Toronto Symposium "Towards Optimized Treatment Outcomes for Dental Implants" Zarb G, ed. *Int J Prosthodont* 1998;11:385-521.
- iv University of Toronto Implant Symposium "The Impact of Osseointegration on the Prosthodontic Patient" Zarb G, ed. *Int J Prosthodont* 1993;6:95-218.
- v University of Toronto symposium "Aging, Osteoporosis, and Dental Implants" Zarb G, Lekholm U, Albrektsson T, and Tenenbaum H eds. Quintessence Publishing Company. 2002.
- vi Goodacre C, ed. *Implant Dentistry 2002*. Loma Linda University Continuing Dental Education, Loma Linda, CA
- vii Brunski JB, Puelo DA, Nanci, A. Biomaterials and biomechanics of oral and Maxillofacial implants: Current status and future developments, a review article. *Int J Oral Maxillofac Implant* 2000;15:15-46.
- viii Jemt, Torsten: personal communication.
- ix Watson RM, Jemt T, Chai J, et.al., Prosthodontic treatment, patient response, and the need for maintenance of complete implant supported overdenture overdentures: An appraisal of 5 years of prospective study. *Int J Prosthodont* 1997;10:345-354.
- x Binon P. The external hexagonal interface and screw joint stability. A primer on threaded fasteners in implant dentistry. *Quint Dent Tech* 2000;23:91-105.
- xi Binon P. Implants and components: Entering the new millennium, a review article. *Int J Oral Maxillofac Implants* 2000;15:76-94
- xii McGill Conference on Overdentures "Mandibular two-Implant Overdentures as Minimum Standard of Care for Edentulous Patients, Feine JS and Carlsson GE eds. Quintessence Publishing Company 2002.
- xiii Taylor TD, Agar JR, Vogiatzi T. Implant prosthodontics: Current perspective and future directions. A review article. *Int J Oral Maxillofac Implant* 2000;15:66-75
- xiv Goodacre CJ, Kan JYK, Rungcharassaeng K. Clinical complications of osseointegrated implants. a review article. *J Prosthet Dent* 1999;81:537-52
- xv Davis H, Lam P, Marshall M, et.al.: Using restorations borne totally by anterior implants to preserve the edentulous mandible. 1999. *JADA* 130:1183-89

Roy T. Yanase, D.D.S.

40 Years of Preprosthetic and Implant Complications 4/13/03

^{xvi} Yanase R and Preston J: Intrusion and Migration. In Fonseca RJ & Davis WH Editors, Reconstructive Preprosthetic Oral and Maxillofacial Surgery. W. B. Saunders Co., Philadelphia, PA, 2nd ed. 1995. pp 246-9.