Dental Implants

Course Objectives
1. To understand the role the dental hygienist plays in initiating discussions as well as addressing individual questions regarding dental implants.
2. To understand the basic requirements involved in all phases of implant therapy.

Key Terms:
1. Implant Analog
2. Implant fixture or body
3. Coping
4. Coping Screw
5. Abutment
6. Osseointegration

Learning Outcomes
1. Describe the three different types of dental implants
2. Identify the different parts of the endosteal implant
3. Describe the basic steps in the surgical process
4. Describe the basic requirements of dental hygiene instrumentation techniques used in treating clients with dental implants
5. Discuss the role of the dental hygienist in treatment planning and long term maintenance of clients with dental implants.

Lecture Outline
1) Introduction
   a) Predictable treatment modality; well-documented
   b) Titanium screw technique approved by ADA in 1986
   c) Success rate = over 90%
   d) RDH is involved in discussions and questions by patients regarding implants
   e) RDH must be a resource to patient
2) Types of Dental Implants - Determined by the way they are integrated into the bone
   a) Subperiosteal – rests on top of bone, beneath periosteum
      i) Edentulous patients with narrow alveolar ridges
      ii) Do not integrate into bone; attached by C.T.
      iii) May often fail
   b) Transosteal (staple implant) – titanium plate with 5-7 parallel posts or dowels, 2 of which protrude through the mandible and serve as abutments for overdenture.
      i) Patients with severe mandibular atrophy
   c) Endosteal – placed into bone (most common type)
      i) Cylindrical form
      ii) Screw - surgically threaded into bone
      iii) Blade form
3) Implant Terminology
   a) Implant Fixture or Body – portion placed in bone
      i) Titanium treated with variety of materials
b) Abutment – screws into implant fixture
   i) Straight, conical, angled or ball shaped
   ii) Design based on type of superstructure

c) Implant Analog – used by lab tech to replicate abutment in fabrication of prostheses.

d) Coping – thin covering that fits over implant abutment and serves to connect abutment & prosthesis

e) Coping Screw – used to attach prosthesis to abutment; the prosthesis may be designed to be cemented, thus eliminating need for screw

f) Osseointegration – union between implant and bone

4) The Implant Treatment Process

a) Implantology is a restorative discipline with a surgical component

b) Primarily oral surgeons & periodontists perform the surgical procedures

c) Responsibility for restoring and maintaining is with general DDS or prosthodontist.

d) Coordination of care is critical for success

e) Surgeon must understand requirements for prosthesis

f) Restorative DDS may be present during surgery to assist in placement of implant fixtures.

5) The Role of the Dental Hygienist

a) Directly involved in educating patients in regards to options for replacing missing teeth.

b) Assess client’s attitudes and priorities and communicate with DDS

c) Observe an implant case from start to finish to understand procedure

d) Educate importance of regular continuing care

e) Provide professional maintenance services

6) Presurgical Phase

a) Initial discussion and evaluation

b) Medical and Dental History

   i) Medical, Dental, & behavioral history = risk assessment

   ii) Contraindications: immunocompromised, uncontrolled diabetes, alcoholism, substance abuse including smoking, anticoagulant meds, psychosis, or paranoia.

   iii) Considerations: inadequate or poor quality of bone, occlusal overload, active periodontitis (must be under control)

   iv) Patient must demonstrate consistent & effective OH

c) Impressions for study models, radiographs including pano, possibly CT scan or tomograph

d) Consultations with implant surgeon and restorative dentist; possibly lab tech

e) Treatment planning and coordination of care

7) Surgical Phase

a) Two-step:

   i) Surgical flap to expose underlying bone

   ii) Impression of bony ridge

   iii) Unit is cast and then placed in a 2nd surgical step

b) One-step:
i) Computer-assisted tomography scan
ii) Approximate casts of maxilla and mandible made
iii) Implant designed on this replica and placed surgically.
iv) Sometimes implant is placed immediately following tooth extraction.
v) Focus is toward “immediate loading”, placing temporary restorations at time of surgery for cosmetic purposes
c) Local anesthesia; sometimes conscious sedation
d) Post-op discomfort similar to tooth extraction

8) Restorative Phase
a) Completed by dentist or prosthodontist
b) Begins after osseointegration
c) Restorative appointments
   i) Impressions
   ii) Try in appointments
   iii) Final delivery and cementation of prosthesis

9) Maintenance Phase
a) Primary motivating factor = prevention of peri-implant disease
b) Peri-implant disease resembles periodontitis, although complex treatment
c) Transmucosal portion = where junctional epithelium meets titanium material to form a seal
d) Titanium – soft and easily altered as are the hydroxyapatite or aluminum coatings of implants
   i) Easily marred
   ii) Galvanic reaction of stainless steel to titanium = corrosion of surface and compromised attachment
e) Changes in surface can affect biologic seal & increased plaque and periimplantitis

10) Client Homecare
a) Stress importance of daily oral hygiene – clean at least 3x day
b) Aids - dependent upon type of prosthesis, height and position of abutments and level of motivation
c) Evaluate position of prosthesis in relationship to soft tissue
d) Floss, tape, electric TB, proxabrush (plastic-coated), rubber tip (whatever works that the patient can use), 0.12% Chlorhexidine; advise against use of metal piks.
e) Explain anatomical details of implant to patient
f) Continually monitor oral hygiene and adjust as necessary.

11) Professional Maintenance
a) Joint effort between restorative DDS & RDH to monitor health of implant.
b) Continuing care intervals based on:
   i) Overall systemic health
   ii) Dental health
   iii) Tissue condition
   iv) Type of implant prosthesis
c) Radiographs to confirm osseointegration and complete seating of abutment or prosthesis; 1st year taken at each 3 month visit.
d) Pocket depth may be greater than around natural teeth
e) Tissue tone and contour may be a more important indicator of peri-implant health than probing depths

12) Instrumentation
   a) Debride and probe with caution
   b) Calculus is usually minimal, soft, and lightly attached; Use plastic, teflon coated, or gold-tipped instruments, plastic tipped ultrasonic insert
   c) Probe gently with plastic probe specially designed for implants so not to disrupt biologic seal
   d) Contraindicated for use on implants:
      i) Metal scalers
      ii) Metal sonic and ultrasonic tips, air polishing devices
      iii) Abrasive prophy pastes

13) Conclusion
   a) Dental Implants are a routine and predictable treatment option
   b) Enhances self-esteem
   c) Enhances ability to eat and chew normally
   d) Regain natural tooth function
   e) The RDH has an important role to play in implant therapy from initial evaluation to long-term maintenance.