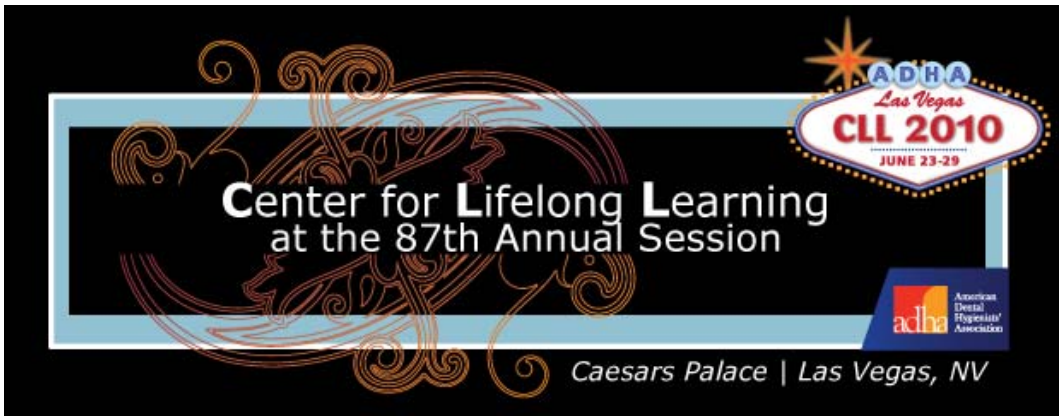

Dental Implants: Assessment and Maintenance Strategies

Saturday, 6/26/2010
2:30pm-5:30pm

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Department of Clinical Education

COURSE TITLE

Dental Implants: Assessment & Maintenance Strategies

COURSE DESCRIPTION

Implant maintenance is essential to the long-term success of dental implants. Patients with dental implants require customized protocols for professional maintenance and at home care. Based on current scientific evidence, this course will present assessment strategies and treatment technologies available to implement a successful implant maintenance program.

COURSE OBJECTIVES

Upon the completion of this course, the participant will be able to:

- Discuss dental implants as a viable treatment option for natural tooth replacement
- Differentiate the various types of dental implants and implant system components
- Identify the role of the hygienist in preoperative assessment, post surgical care, and implant maintenance
- Assess implant health through evaluation of soft tissue, occlusion, mobility, and radiographs
- Define current probing recommendations and techniques
- Incorporate the benefits of ultrasonic technology into implant maintenance to facilitate thorough debridement and enhance treatment outcomes
- Establish an appropriate recare schedule and customized home care regimen for each implant patient

Dental Implants: Assessment & Maintenance Strategies

Edentulism

Etiology of edentulism includes:

- Anodontia – a genetic disorder characterized by partial or complete absence of primary or permanent teeth
- Dental caries
- Failed RCT
- Fracture or trauma
- Periodontal disease
- Neglect
- Iatrogenic dentistry
- Socioeconomic hardship

Tooth Loss results in:

- Chewing problems
- Difficulty swallowing
- Occlusal changes
- Secondary tooth loss
- Supraeruption
- TMJ problems

Health consequences resulting from tooth loss that affect quality of life include:

- Decreased chewing ability
- Decreased intake of fruits & vegetables
- GI disorders
- Reduced consumption of high fiber foods
- Impaired nutrient intake
- Poor swallowing

Evolution of Dental Implants

Benefits of Dental Implants:

- Maintain facial structure
- Stimulate bone growth
- Predictable long term solution
- Highly esthetic
- Functional
- No secondary caries
- Comfortable

Types of Dental Implants:

- Endosteal – placed in the bone
    - Root Form
        - Most successful
        - Vary in length and diameter
        - Placed in one-stage or two-stage procedure
    - Mini
        - Reduced width; range from 1.8 to 2.4 mm width
        - Useful when conventional implants are not an option due to narrow ridges
        - Placed in non-surgical setting
        - Immediate load
    - Blade
        - Used in very narrow ridges
- Periosteal - metal framework lies on top of ridge
    - No osseointegration
    - 2 stage surgery
    - Ideal for patients with bone of inadequate height or width
- Transosteal – go thru the bone; no longer placed

Implant Components

- Body
- Abutment
- Screw
- Prosthesis

BODY

- Portion of root-form implant available for bone to implant contact
- Replaces root
- Enables attachment of prosthesis
- Made of titanium

TITANIUM

- Strength of steel, but 45% lighter
- Biocompatible and osseophilic
- Non-corroding metal
- Scratches easily
- Poor heat conductor

Titanium and oxygen form titanium oxide. Bone cells attach to this rough coating.
Current trend in implantology is to roughen the surface of the titanium by applying a layer of hydroxyapaptite to encourage earlier osseointegration.

OSSEOINTEGRATION – attachment of bone to implant surface
Histological, not clinical, observation

ABUTMENT

- Portion that joins the implant with the restoration
- Composed of titanium, aluminum oxide,ceramic, or zirconia

SCREWS

- Secure two part together: Crown – Abutment
  Abutment – Implant
- Protect against implant forces

PROSTHESIS / RESTORATION

- Crown
- Implant retained denture (removable)
- Implant retained denture (fixed)
- Implant retained bridge

Preoperative Assessment

Potential Implant Candidates:

- 16-18 years of age or older
- Congenitally missing teeth
- Single edentulous site
- Partial denture patients
- Full denture patients
- Trauma cases
- Failing endodontics

Preoperative Considerations:

- Systemic
  - Major Systemic Factors
    - Diabetes
      - Increased periodontal risk
      - Impaired wound healing
      - Contraindicated for implants if uncontrolled
    - Smoking
      - Increased periodontal risk
      - Reduced success rate 11.3% vs 4.8% failure rate

        - Higher bleeding indices, increased inflammation, increased bone loss around implants
    - H&N radiation
        - 30% higher failure rate
        - Increased complications in peri-implant tissues if salivary flow is inadequate
    - Bisphosphonate therapy

Oral:	IV:
• Fosamax • Boniva • Actonel • Didronel • Skelid • Generic brands	• Aredia • Zometa • Reclast

"BON" – Biphosphonate-associated osteonecrosis
- Associated with IV bisphosphonate therapy and dental extractions
- Risk for patients on oral bisphosphonate extremely low
- Symptoms include (at extraction site)
    - Pain
    - Soft tissue swelling
    - Infection
    - Loosening of teeth
    - Drainage
    - Exposed bone

ADA Council on Scientific Affairs
Dental Management of patients receiving oral bisphosphonate therapy, Aug 2006
www.ada.org

- Intraoral
    - Why is patient edentulous or partially edentulous?
    - Condition of adjacent teeth
        - Periapical lesions on adjacent teeth can cause retrograde peri-implantitis
        - Periodontal disease increases risk for peri-implantitis and failure
        - Clenching/grinding can lead to looseness of components or fracture
    - Radiograph Assessment
- Psychological
- Financial
- Behaviors

Implant Maintenance

Routine Assessments:
- Soft tissue
- Hard tissue (bone)
- Occlusion
- Mobility
- Prosthetic integrity
- Home care

SOFT TISSUE

- Perimucosal seal
    - Zone between implant and soft tissue
    - Biological seal that prevents microorganisms from entering tissues surrounding implants
    - Composed of junctional epithelium

	Teeth	Implants
Junctional Epithelium	On enamel	On titanium
Sulcus Depth	1-3 mm when healthy	Determined by length of abutment and margin location
Gingival Fibres	Multi-directional from cementum to bone	Only parallel fibres
Connective Tissue Attachment	Sharpey's fibers	Osseointegration
Movement	Ligament allows for adaption from occlusal forces	No adaptive capability- ankylosed
Proprioception	Receptors in ligument	No receptors

PROBING GUIDELINES: Probing is imperative to evaluate tissue status

- Probe at placement to obtain a baseline depth.
- Probing depth does not matter; a change in that # matters
- Use < 20g pressure
- Use a nylon or plastic probe, dipped in CHX, and reserved for implant only use to reduce cross contamination from other pockets
- Maintain as close to 0 degree angulation as possible
- After 1 year of stable probing, probe only buccal & lingual. Interproximal can be assessed from BWX

Healthy Peri-Implant Tissue:	**Diseased Peri-Implant Tissue:**
• Healthy color, texture, & size • Contour defined by implant/ restoration shape • Evidence of attached gingiva	• Red, purple, cyanotic • Glossy, fibrotic • Enlarged, cratered • BOP • Exudate or suppuration

HARD TISSUE (BONE): Radiographic assessment

Diagnostically-acceptable radiograph:

- Can see thread count
- View of crestal bone is critical
- View of apex is not critical

Necessary to assess:

- Bone levels on mesial and distal
- Implant integrity

Radiograph Protocol:

- Baseline with prosthetic delivery
- 6-8 months later; compare to baseline
- 1 year

If no changes at 1 year, next radiograph in 3 years unless symptomatic
If changes, radiograph every 6-8 months until stable for 2 consecutive exams.

OCCLUSION:

- Occlusal checks twice a year at maintenance appointments
- Easy to correct when detected early
- Difficult to correct after major damage

Overload: Situation in which the masticatory forces applied to the implant exceed the capacity of the bone-implant interface, implant or componetry to withstand it.
Fatigue fracture: Structural failure caused by repetitive stresses, which caused a slowly propagating crack to cross the material.

MOBILITY:

- Place instrument under embrasures and apply gentle pressure
- Assume prosthetic or component mobility first
- Refer to restorative dentist

PROSTHETIC INTEGRITY:

- Current theory is not to disassemble superstructures unless there is a problem
- If screws can be seen, gentle movement with probe or explorer will detect looseness or possible fracture
- Replace loose screws

Peri-implant mucositis: Reversible inflammatory reactions in the soft tissues surrounding and implant exposed to the oral environment.
Peri-implantitis: Term for inflammatory reactions in the hard and soft tissues, with loss of supporting bone, surrounding an implant exposed to the oral environment.

ICOI Pisa Implant Quality of Health
International Congress of Oral Implantologists, Pisa, Italy, Consensus Conference, 2007

Implant Quality Scale Group		Clinical Conditions
I.	Success (optimum health)	No pain or tenderness upon function 0 mobility <2 mm radiographic bone loss from initial surgery No history of exudates
II.	Satisfactory Survival	No pain on function 0 mobillity 2-4 mm radiographic bone loss No history of exudates
III.	Compromised Survival	May have sensitivity on function 0 mobility >4 mm radiographic bone loss (less than ½ of implant body) Probing depth > 7mm May have history of exudates
IV.	Failure (clinical or absolute failure)	Any of the following: Pain on function Mobility Radiographic bone loss > ½ length of implant Uncontrolled exudates No longer in mouth

Instrumentation

Similarities	Differences
Components of bacterial plaque	Softer instrument materials
Calculus formation	Generally less tenacious calculus
Importance of patient education	Site specific oral hygiene techniques

Ultrasonic Instrumentation:

- Use implant specific insert or tip (i.e, Cavitron SofTip)
- Benefits of ultrasonic include
    - **Acoustic Streaming:** An ultrasonic effect due to the forceful fluid flow
    - **Acoustic Turbulence:** Tip movement creates the fluid to move in a swirling manner
    - **Cavitation:** Tip movement produces bubbles that implode creating a rippling shock wave Bubbles entrapped in a liquid are capable of removing particles and adherent bacteria from surfaces

Polishing the implant is not contraindicated as long as one of the following pastes are used:

- Fine prophy paste
- Air polishing – must be followed by irrigation
- Toothpaste
- Tin oxide

Home Care

Post surgical instructions

- Warm salt water rinses after meals & before bed**.**
- Follow up with an antimicrobial rinse for 2 minutes.
- Brush teeth but avoid surgery site for several days

Prosthesis delivery

- Oral hygiene instructions with multiple home care devices.
- Reduce number as patient demonstrates proficiency.
- Evaluate oral hygiene at 1-2 weeks & 1 month
- Adjust devices & techniques as needed.

Ongoing

- Set patient up for success with home care, not failure
- Have patient demonstrate home care processes
- No need to re-invent the wheel

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