Prostho sheet #16

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Dental oral implantology in prosthodontics

\*\*I don’t think that they ask about history in viva so I’m not going to mention it.

-The only 2 implant systems that can be approached extraorally are: Small (mandibular stable implants) and Bosker (trans-mandibular implant).

-Branemark was the first to describe osseointegration.

-**Osseointegration (histological definition)** is a process of direct structural and functional connection between the Living bone and the surface of the alloplastic material (titanium) which is achieved under functional loading at a **microscopic** level, it’s also called “functional ankylosis".

-Zarb definition (clinical definition): A time dependent healing process where asymptomatic rigid fixation of alloplastic material is achieved and maintained in bone during functional loading.

-**Fibrointegration**: is fibrous tissue between the interface surface of the Implant and the bone to mimic the PDL like the natural teeth, no primary stability will be there and the failure rate was more than 75 % after 5 years so fibrous tissue between the bone and metal is considered a non-integrated failed implant.

-Many different implant materials were known: gold, silver, stainless steel, titanium, palladium and nonmetallic materials such as Indian rubber, ivory, porcelain, poly methyl methacrylate, Ceramics, carbon, and zirconium.

-Ti is the most common implant material:

1. Biocompatible

2. Excellent mechanical properties; 6x stronger than cortical bone.

3. Intimate contact with bone.

4. It contains Nickel so have the corrosion resistance property.

An oxide layer forms on the surface of titanium causing the osseointegration.

-Coating materials: produce rough surface on the implants to increase the surface area between the implant and the bone.

1. Ti plasma spray: wait 5 months for the maxilla and 3 for the mandible.

2. Sand blasted large grit acid etch: wait 3 months for the maxilla and 1.5 months for the mandible.

3. Hydroxyapatite: it fails in the end due to cracks and microorganisms invasion.

4. Bioactive materials: 3 weeks for the maxilla and 2 weeks for the mandible but very expensive.

-methods of coating: sandblasting, acid etching, and laser.

\*\*comparison:

1. Stainless steel, Co/Cr, gold alloys, and polymethyl methacrylate are biotolerant with fibrous distant osteogenesis.
2. Ti and ceramics are bioinert with close intimate contact with bone,
3. Bioceramics and hydroxyapatite are bioactive with a true chemical bond.

-Implants classification: according to form and position:

.Intramucosal implants.

.Titanium mucosal inserts.

.Subperiosteal implants: metal framework overlying the bone, used only in the mandible when it’s 6 mm short but low success rate and risk of infection spread.

.Transosseous dental implants (stable implants): needs GI and extraoral approach and used in mandible only.

.Endosseous dental implants, used these days.

-Strama and IP system introduced 4mm implant with a 4.8 mm diameter and these used in posterior mandible where bone is short or where we are very close to vital structures.

-Classification according to surgical steps: one step without submerging the implant and covering it by mucosa (ITI system), and two steps; where the implants are submerged then we reopen and put a gingival former then connect it with the prosthesis.

- Indications of dental implants:

. Patients older than 19 after bone growth has stopped, we start with motivating the patient to maintain good oral hygiene.

. ***Completely edentulous upper arch we either use 6-implant-supported-fixed prosthesis (cr0wns/bridges) or 2***-implant retained over-denture with ball attachments, bar attachments or magnet.

. Partially edentulous long span.

. Replacing missing central or lateral incisor.

. Patients with compromised denture bearing area,

. Patients with gag reflex.

. Patients with psychological/emotional problems.

. Patients with unrealistic prosthodontic expectations.

. Patients with parafunctional habits/bruxism

. Patients with poor muscular coordination.

. Patients with hypodontia.

Contraindications are either absolute or relative;

. Unfavorable interarch relationship, class 3 or class 2 div1.

. Pathological lesions in the ridge or poor oral hygiene.

. Insufficient bone quality/quantity (relative).

. Hematological disorders and metabolic bone diseases (relative).

. Patients with psychological disorders (absolute).

. HIV (relative).

. Heavy smoking/alcohol (relative).

. Bisphosphonate (oral/relative and IV/absolute)

. Uncontrolled diabetes.

. Patients with CVD, heart diseases or recent MI (absolute).

* Radiation is not a contraindication, we wait one year and give hyperbaric oxygen.

Assessment:

-general:

1-patient's complain.  
2-medical history.  
3-psychological assessment.

4-social history.  
5-dental history.

-local:

1-type of mucosa.

2-health of remaining dentition/PDL.

3-alveolar ridge shape and form.

4-mucosal soft tissue attachments.

5-interarch and interocclusal space horizontally and vertically.

\*\* We take OPG, lateral ceph, periapicals, CT and CBCT.

\*\* Ridge mapping to assess bone width manually or using osteometer.

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