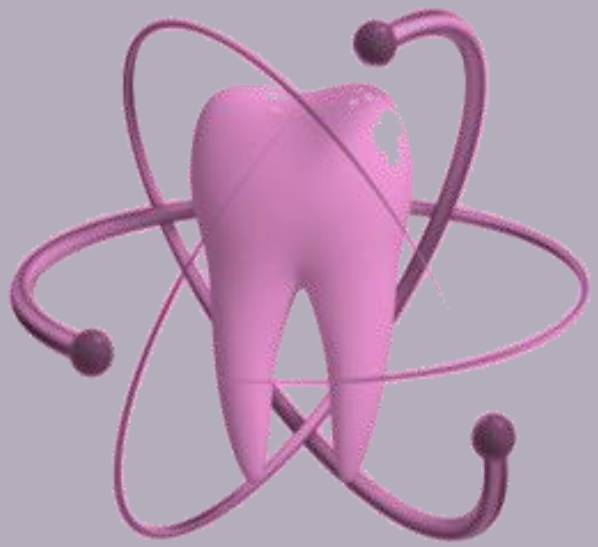
Dental Implant

Dr. Inas Aziz M. Jawad



UNIVERSITY OF MOSUL
COLLEGE OF DENTISTRY

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Department of
Prosthodontics

Dental Implants

I. Definition

II. Advantages & disadvantages

III. Classifications

IV. Materials used for dental implant.

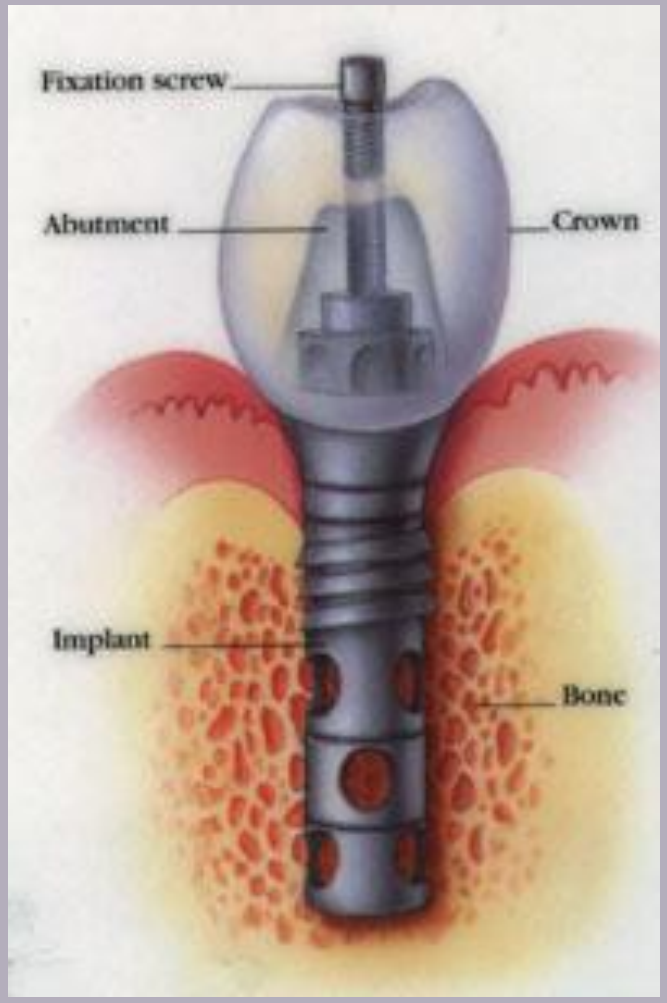
- **Dental Implant:**

- **Definition:**

  A prosthetic device or alloplastic material that is surgically inserted into soft or hard tissues, to be used for functional or cosmetic purposes.

Dental implant provides an excellent fixed (non-removable) solution to replace a single tooth or even many teeth that have been lost. It overcomes many disadvantages of other conventional methods of restorations (removable or fixed prostheses).

Dental implants



Advantages of implant over conventional treatment

1) Better maintenance of residual bone.
2) Better improvement of occlusion, occlusal vertical dimension, phonetics and facial esthetics.
3) Improve / regain oral proprioception
4) Increase prosthesis success
5) Maintains muscle of mastication and facial expression
6) Reduce size of prosthesis
7) Improve stability and retention of removable prosthesis
8) More permanent replacement
9) More psychological health
10) In cases of partial missing, adjacent teeth do not require splinted restoration, therefore this decreases adjacent tooth loss and maintains bone in site.

Disadvantages of implant treatment

1) Expensive.
2) The patient requires surgery.
3) Time consuming.
4) Technically complex.

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CLASSIFICATIONS OF DENTAL IMPLANTS

Dr. Inas Aziz

I) Depending on the placement within the tissues

1) Epithelial / mucosal implants
2) Epiosteal / Subperiosteal implants
3) Endosteal / endosseous implants
4) Transosteal / transosseous implants

Epithelial / mucosal implants

They are inserted into the oral mucosa.

Disadvantages

1. painful healing
2. requirement of continual wear

Titanium Mucosal Implants

Epiosteal / Subperiosteal Implants

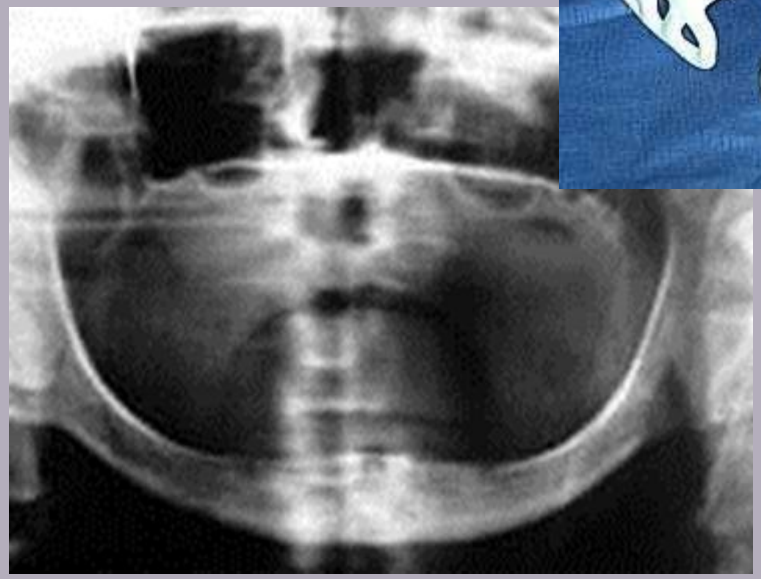
- They placed directly beneath the periosteum overliying the bony cortex (not anchored inside the bone)
- Receive primary bone support by resting on it.

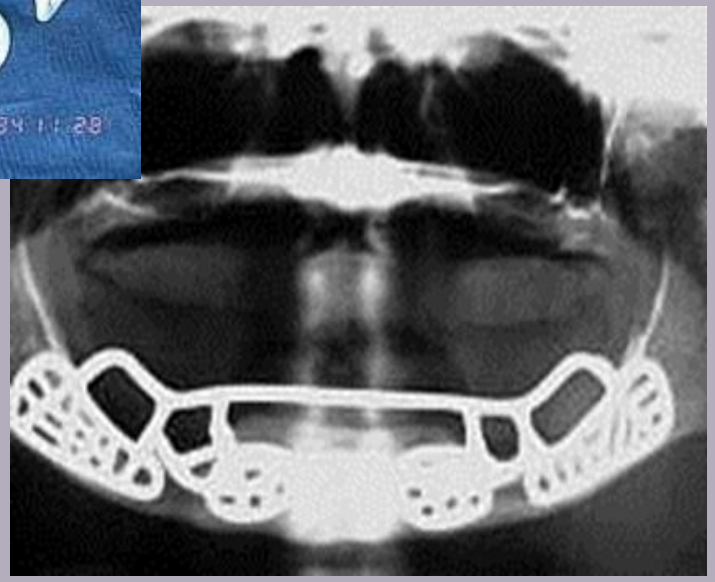
Disadvantages :

1) Slow, predictable rejection of the implant

2) Bone loss associated with failure

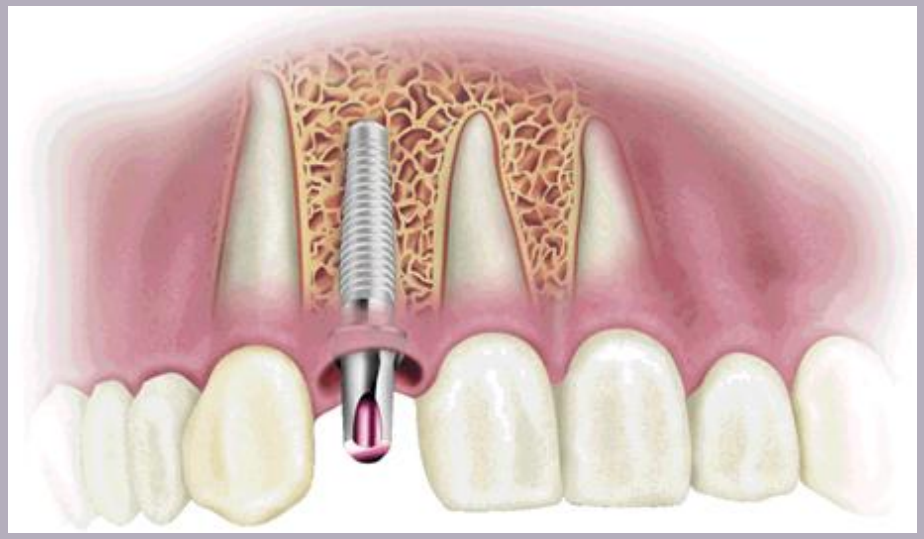
- Usually indicated in a severely resorbed, completely edentulous mandible which does not offer enough bone height to accommodate root form implants as anchoring devices.





Endosteal / Endosseous Implants

- Extends into basal bone for support
- It transects into one cortical plate

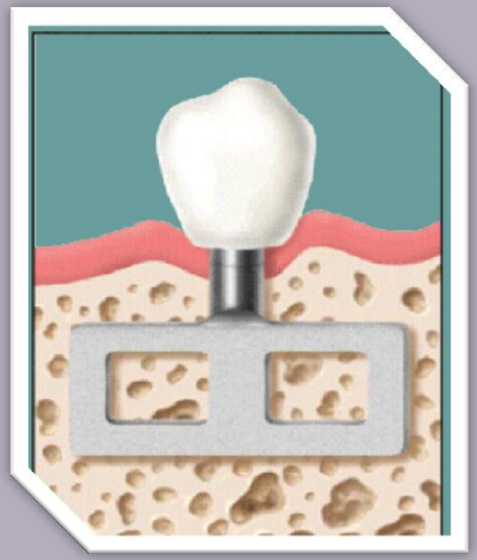


Endosteal implants

1-Root form implants

1. Cylinder
2. Screw root form
3. Cone shaped
4. Combination

2-Ramus frame implants



3-Plate form implants

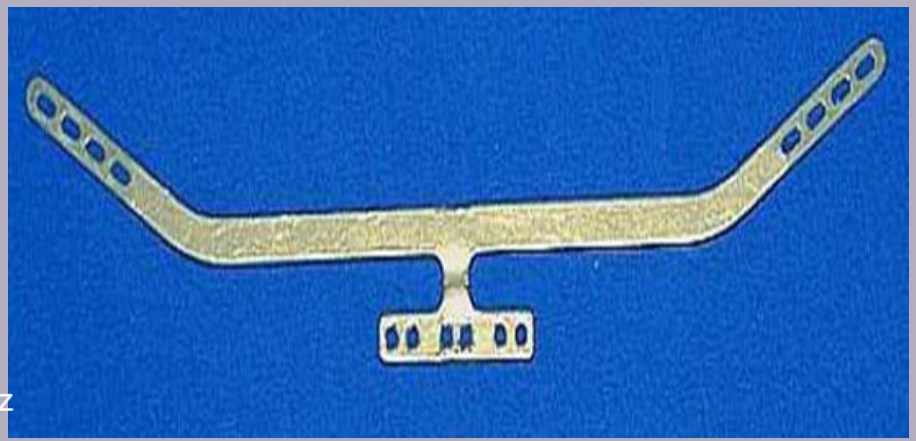
Endosteal or Endosseous implant

A. Plate-form implant :

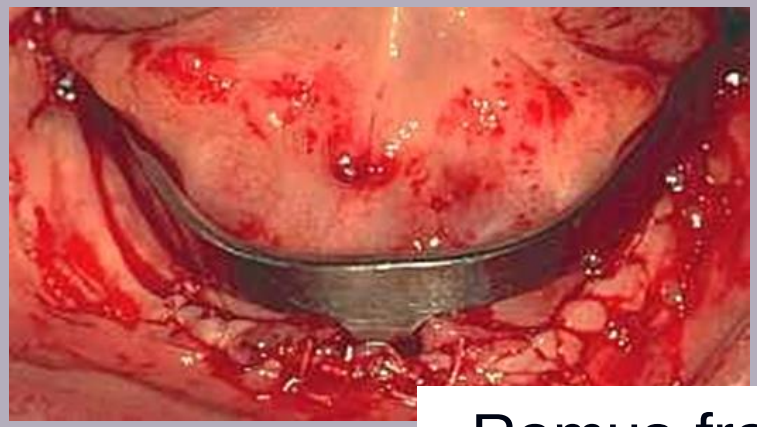
Blade Implants have a long track record, much longer than the Root form Implants. Their name is derived from their flat, blade-like (or plate-like) portion, which is the part that gets embedded into the bone.

B. Ramus-frame implant

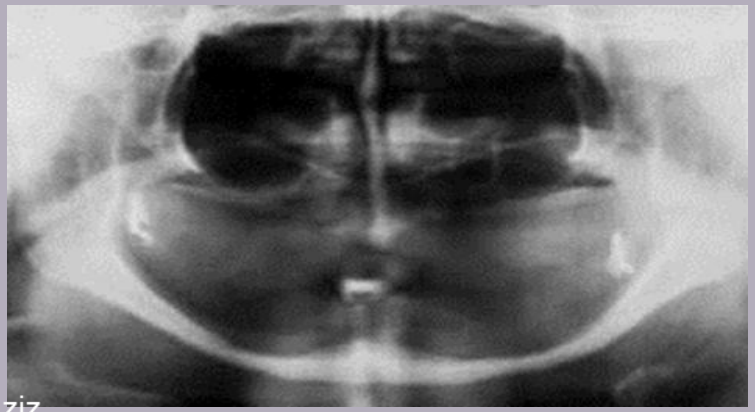
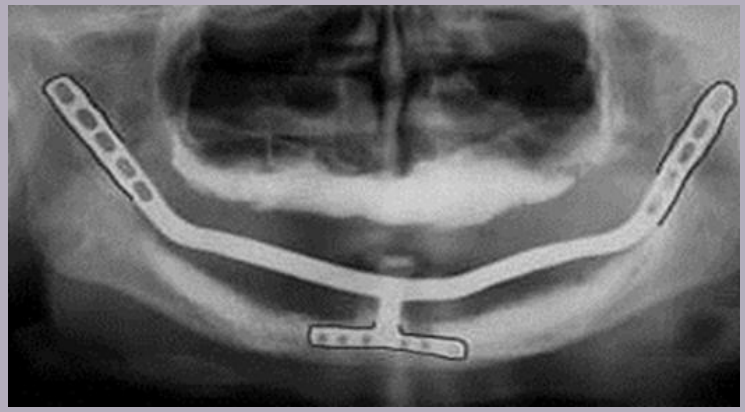
- These implants are designed for the edentulous lower jaw only and are surgically inserted into the jaw bone in three different areas: the left and right back area of the jaw (the approximate area of the wisdom teeth), and the chin area in the front of the mouth.
- It's indicated in a severely resorbed, edentulous mandible which does not offer enough bone height to accommodate Root form Implants.
- It provides a tripodial stabilization of the thin lower jaw and protects it from fracturing.



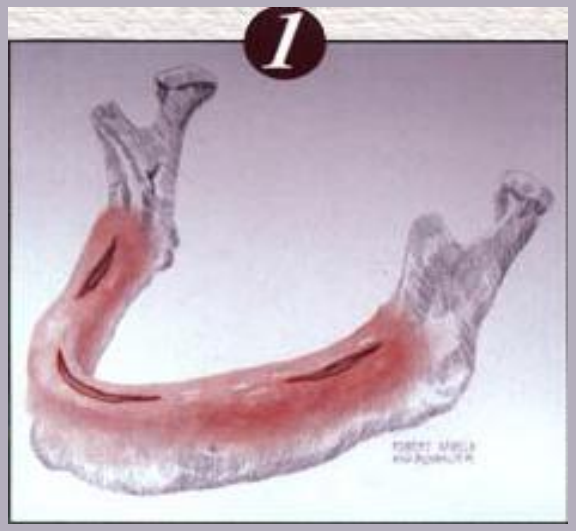
Ramus-frame implant

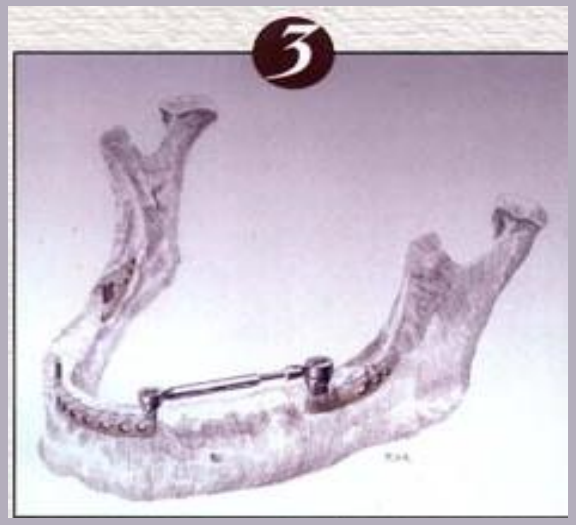


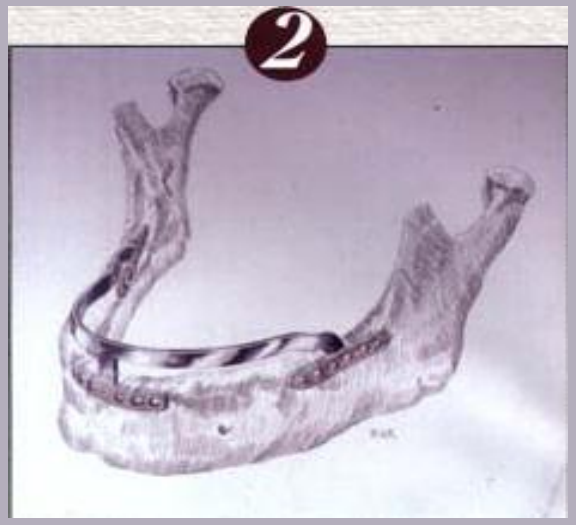


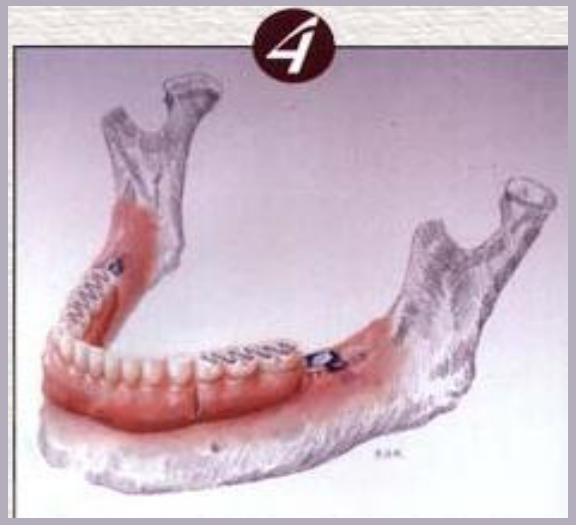



Ramus-frame implant







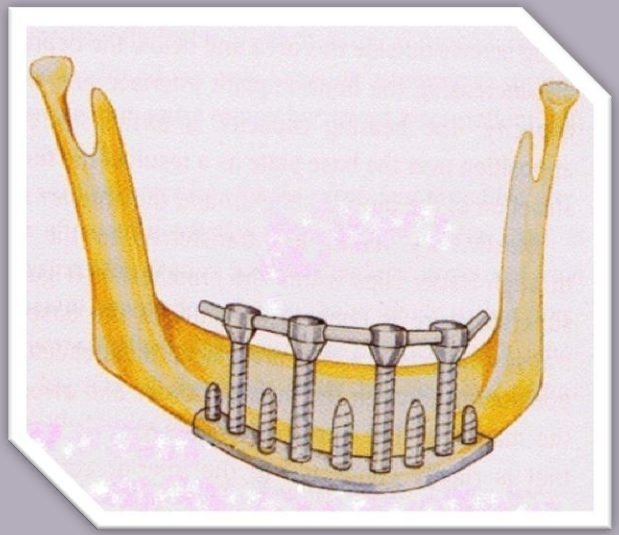


C. Root form implant

- The most popular implants in the world today.
- come in a variety of shapes, sizes, and materials
- can be placed wherever a tooth or several teeth are missing when enough bone is available to accommodate them.
- if the bone volume is not sufficient to place Root form Implants, Bone grafting procedures within reasonable limits should be initiated, in order to benefit from these implants.

Transosteal / Transosseous Implant

- Also called as Staple Bone Implant, Transmandibular Implant
- Penetrates both cortical plate and passes through the entire thickness of the alveolar bone
- Use restricted to anterior area of mandible
- It is not used much any more because they necessitate an extraoral surgical approach.



The most universally used implants are *root form endosseous implants* which extend into basal bone for support and transect one cortical plate.

Dental Implant Components

A dental implant actually consists of:

A. PRIMARY COMPONENTS:

1. anchorage part/ implant body/ fixture.
2. abutment.
3. superstructure.

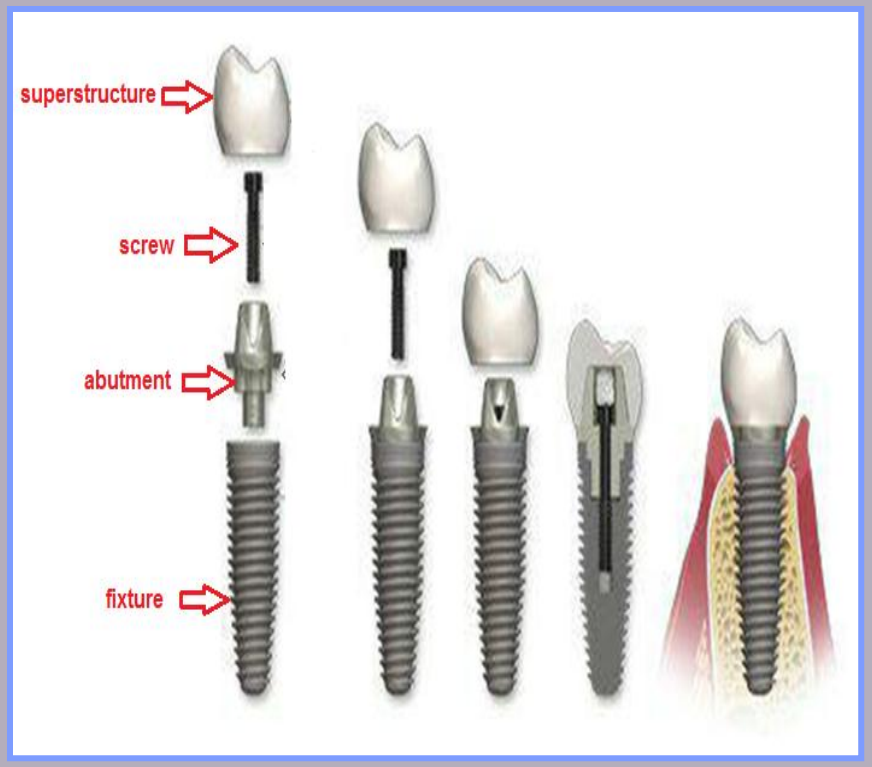
B. ACCESSORIES:

a– Surgical 1. cover screw

2. gingival former

b– Prosthetic 1. implant analogue

2. impression post



Dental Implant Components

ANCHORAGE PART/ IMPLANT BODY (FIXTURE): is the implant component that is placed into jaw bone to act just like a tooth root, providing a sound and permanent foundation.

Types of fixture:

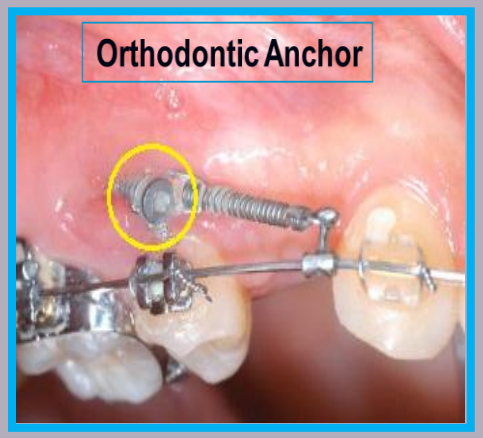
1. Cylindrical or tapered cylindrical
2. Smooth or threaded surface to increase surface contact and maximize initial contact with the bone.
3. Solid or with holes or vents to allow bone growth through.

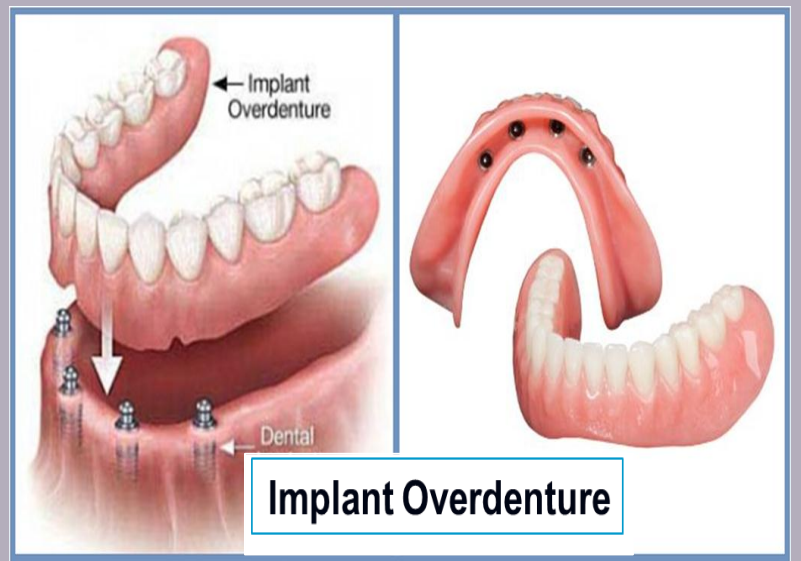
IMPLANT SUPERSTRUCTURE:

is a prosthesis fabricated with the support of dental implants.

Types:

1. Fixed prostheses: crowns and bridges, or act as orthodontic anchor.
2. Removable prostheses: overdenture, maxillofacial prostheses.
3. Fixed detachable prostheses: Hybrid dentures





II) Depending on the materials used

1) METALLIC IMPLANTS

- Gold alloys
- Cobalt-chromium alloys
- Stainless Steel
- Niobium
- Tantalum
- Commercially pure Titanium(CpTi)
- Titanium alloy (Ti-6Al-4V)

2) CERAMIC IMPLANTS:

- Aluminum oxide
- Zirconium
- Hydroxyapatite
- Tricalcium phosphate
- Bioglass
- Carbon silicon

3) POLYMERIC IMPLANTS:

- Polyethelene
- Polyamide
- PMM
- Polytetra
- Polyurethene

Implant materials

Implant materials can be classified based on the type of material used and the biological response they elicit when implanted

1- Biotolerant: these materials are not easily rejected when implanted into living tissue but are surrounded by a fibrous layer.

E.g. 1) Metals like gold, Co-Cr alloy, stainless steel, zirconium, nobium

2) Polymers like polyethylene, polyamide, polymethylmerthacrylate, polyurethane

Implant materials (cont.)

2- Bioinert: these materials allow close apposition of bone on their surface, leading to contact osteogenesis.

E.g.

1) Metals like commercially pure titanium (Cp- Ti) and titanium alloy
2) Ceramics like aluminum oxide and zirconium oxide CreatingSmiles

Implant materials (cont.)

3- Bioactive: these materials allow the formation of bone onto their surface, by ion exchange with host tissue leads to the formation of a chemical bond along the interface.

E.g.

Ceramics like HA, tricalcium phosphate, bioglass, fluorapatite, and carbon-silicon.

Implant materials (cont.)

- Implant materials can be classified based on the type of material used and the biological response they elicit when implanted

Biodynamic activity	Chemical compositions		
	metals	ceramics	polymers
biotolerant	▪ Gold alloys ▪ Cobalt-chromium alloys ▪ Stainless Steel ▪ Niobium ▪ Tantalum		▪ Polyethelene ▪ Polyamide ▪ PMM ▪ Polytetra ▪ Polyurethene
bioinert	▪ Commercially pure Titanium(Cp Ti) ▪ Titanium alloy (Ti-6Al-4V)	▪ Aluminum oxide ▪ Zirconium	
bioactive		▪ Hydroxyapatite ▪ Tricalcium phosphate ▪ Bioglass ▪ Carbon silicon	

- Biological response means the relation of the implant material with the surrounding tissues.


Thanks