

هروری بر بایو متریال های جایگزین استخوان

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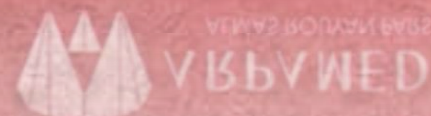
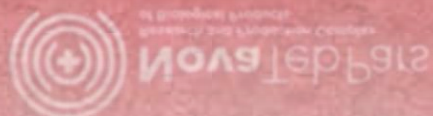
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کاربردهای بالینی ممبرین ها و انواع آنها

**Classification and Clinical
use of membranes in
implant dentistry**

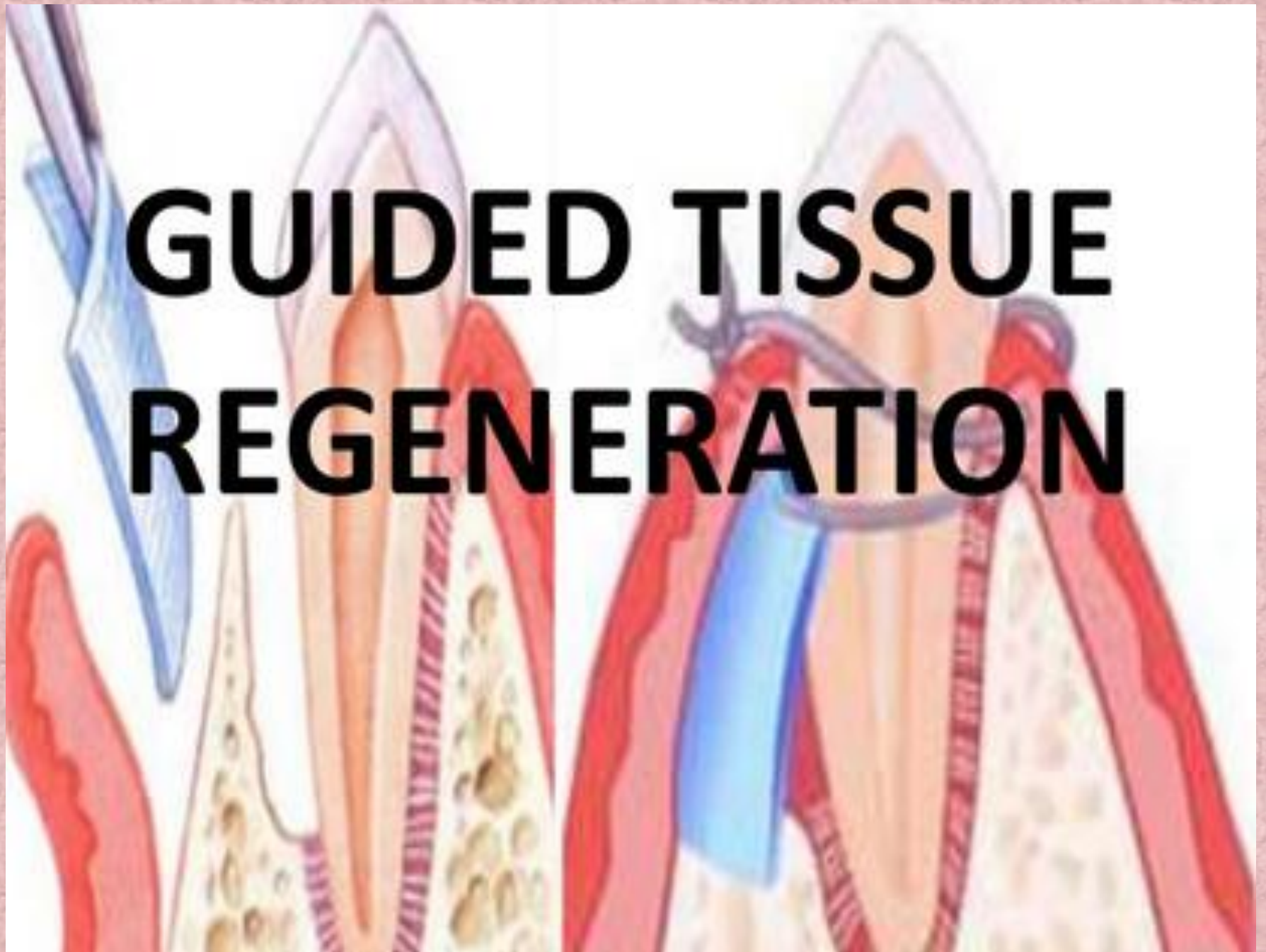


Outline

- **GTR and GBR**
- **Membrane classification**
- **How to choose?**
- **Clinical and surgical considerations**



GUIDED TISSUE REGENERATION





THE BIOLOGIC CONCEPT/FOUNDATION OF GTR

○ *Principle of GTR is based on the assumption that only the periodontal ligament cells have the potential for the regeneration of the attachment apparatus of tooth.*

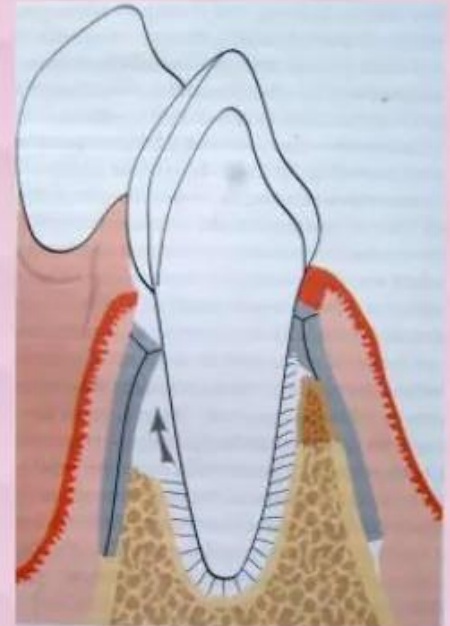
○ *It consists of placing barriers of different types to cover the bone and periodontal ligament thus temporarily separating them from gingival epithelium.*

○ *Excluding the epithelium and the gingival connective tissue from the root surface during the post surgical healing phase -*

✓ *Prevents epithelial migration into the wound.*

✓ *Favours repopulation of the area by cells from the periodontal ligament and bone cells.*

○ *Guided tissue regeneration with the use of barrier membranes works on the principle of cell exclusion.*





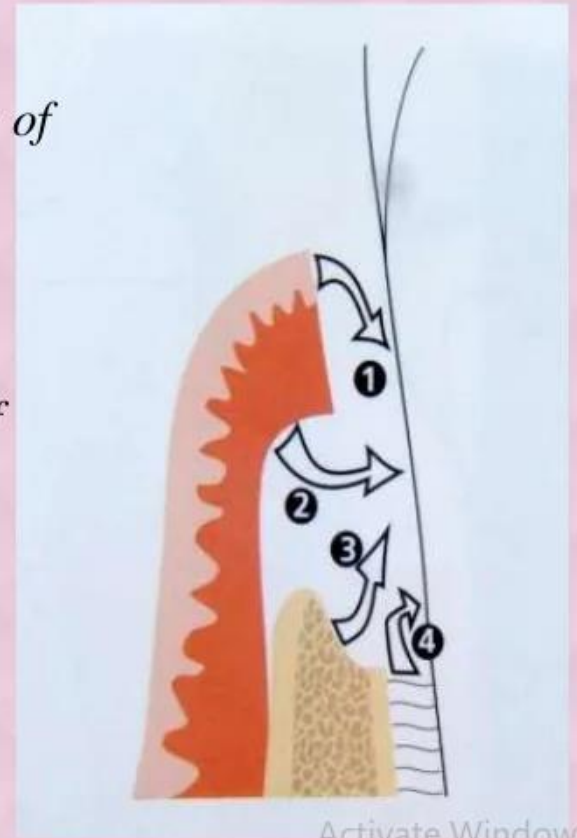
MELCHER'S CONCEPT/TISSUE COMPARTMENT HYPOTHESIS

Melcher's hypothesis

In 1976, Melcher suggested in a review paper that the type of cell which repopulates the root surface after periodontal surgery determines the nature of the attachment that will form.

Root surfaces may be repopulated by four different types of cells:

- 1. Epithelial cells.*
- 2. Cells derived from the gingival connective tissue*
- 3. Cells derived from the bone*
- 4. Cells derived from the periodontal ligament*



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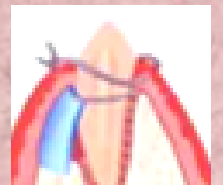
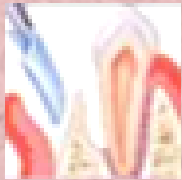
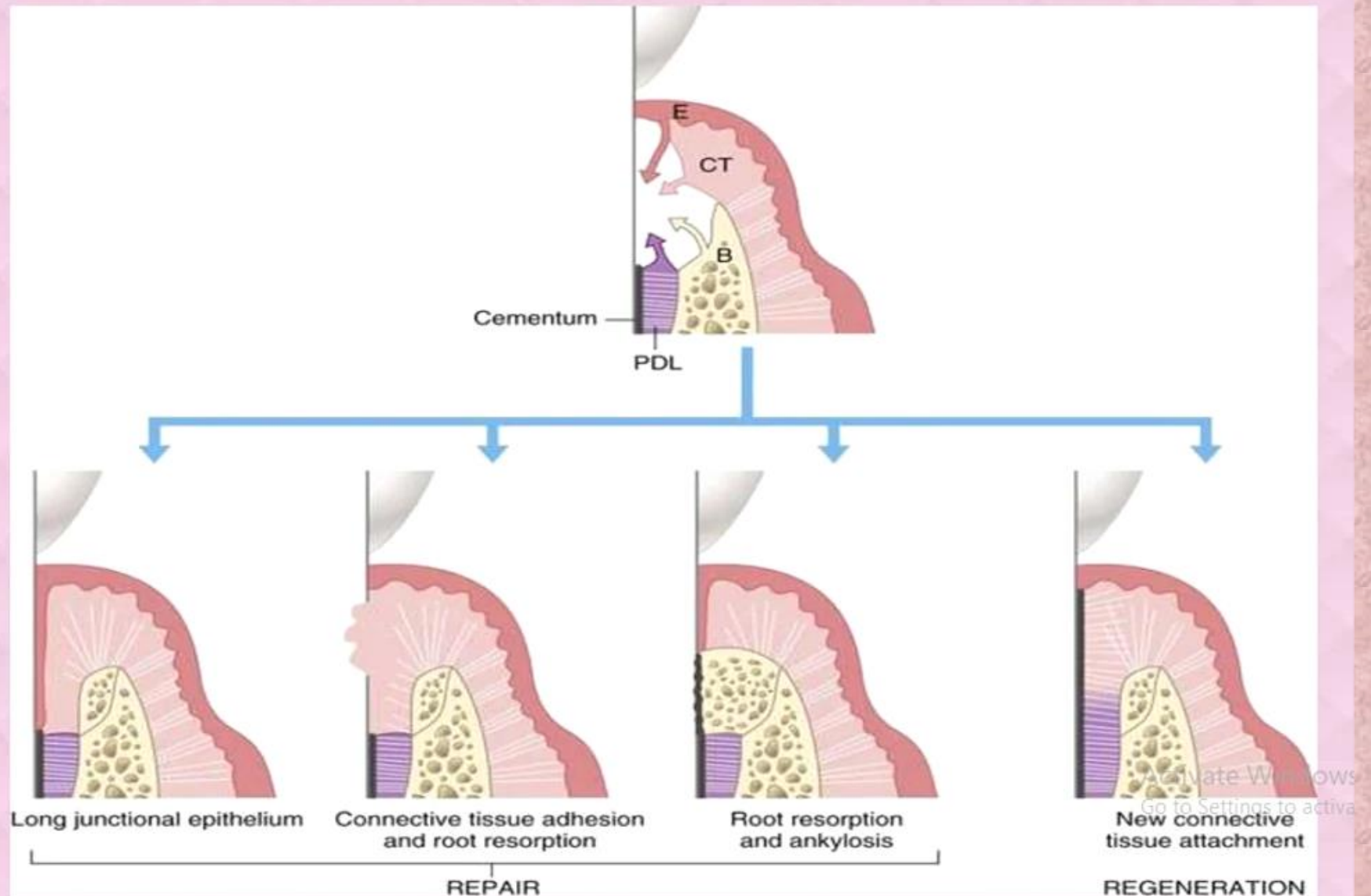
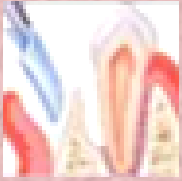


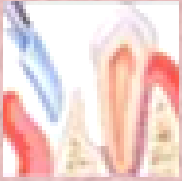
Figure: Schematic diagram depicting the concept of Melchers hypothesis





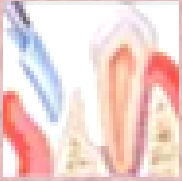
- Biocompatibility
- Cell Occlusion
- Tissue Integration
- Space Making
- Good Handling Properties





Biocompatibility





Cell Occlusion





OBJECTIVES OF AN IDEAL BARRIER MEMBRANE

- *It should fulfill occlusive requirements of GTR concept.*
- *It should be biocompatible and/or allow tissue integration.*
- *Non-toxic and non-carcinogenic.*
- *Chemically inert and non-antigenic.*
- *Easily sterilizable.*
- *Easy to handle during surgery.*
- *Sufficiently rigid so as to maintain space between it and root surface.*
- *Supplied in different designs to suit the specific clinical situations*
- *Easily storable and long shelf life.*
- *Easily retrievable in case of complication.*
- *Should not be too expensive.*
- *able in case of complication.*





CLASSIFICATION

Classification by Minabe in 1991:

Nonabsorbable

- Polytetrafluoroethylene (e-PTFE) type
- Titanium reinforced polytetrafluoroethylene type
- Rubberdam

Bioabsorbable

Natural

- Collagen type
- Synthetic polymer type(lactate-glycol compound)
- Connective tissue graft
- Durameter
- Oxidized cellulose

Synthetic

- Alloderm
- Polyurethanes
- Polylactic acid
- Polyglycolic acid





Classification by Gottlow in 1993:

First generation membranes: Non-resorbable membranes

- ✓ Millipore Filter
- ✓ Expanded polytetrafluoroethylene membrane (e-PTFE) GORE-TEX
- ✓ Nucleopore membrane.
- ✓ Rubber Dam.
- ✓ Ethyl cellulose.
- ✓ Semi-permeable silicon barrier.

Second generation membrane: Resorbable membranes

- ✓ Collagen – Biomend, Periogen, Paroguide, Biostite, Tissue guide.
- ✓ Polylactic acid Membrane – Guidor, Vicryl, Atrisorb, Resolut, Epiguide, Biofix.
- ✓ Vicryl Mesh.
- ✓ Cargile Membrane.
- ✓ Oxidised Cellulose Membrane.





Third generation membrane:

They are the resorbable membrane with added growth factor incorporated with an aim of improving early bone healing.





Advantages and disadvantages of non-resorbable membranes

Advantages:

Excision of epithelial and gingival CT from PD defect

Maintains space between defect and barrier allowing entry of cells from PDL and alv bone.

Helps to stabilize clot which may enhance regeneration

Space maintenance over an extended time and can remain in place for longer period.

Disadvantages:

Membrane exposure

Contamination

Infection

Bone loss





Advantages and disadvantages of resorbable membranes

Advantages

Reduce operatory time

More tissue compatibility

Increase patient acceptance

Elimination of second surgery for barrier removal

Reduces risk of loss of regenerated attachment owing to reentry surgery.

Disadvantages

Resorbable

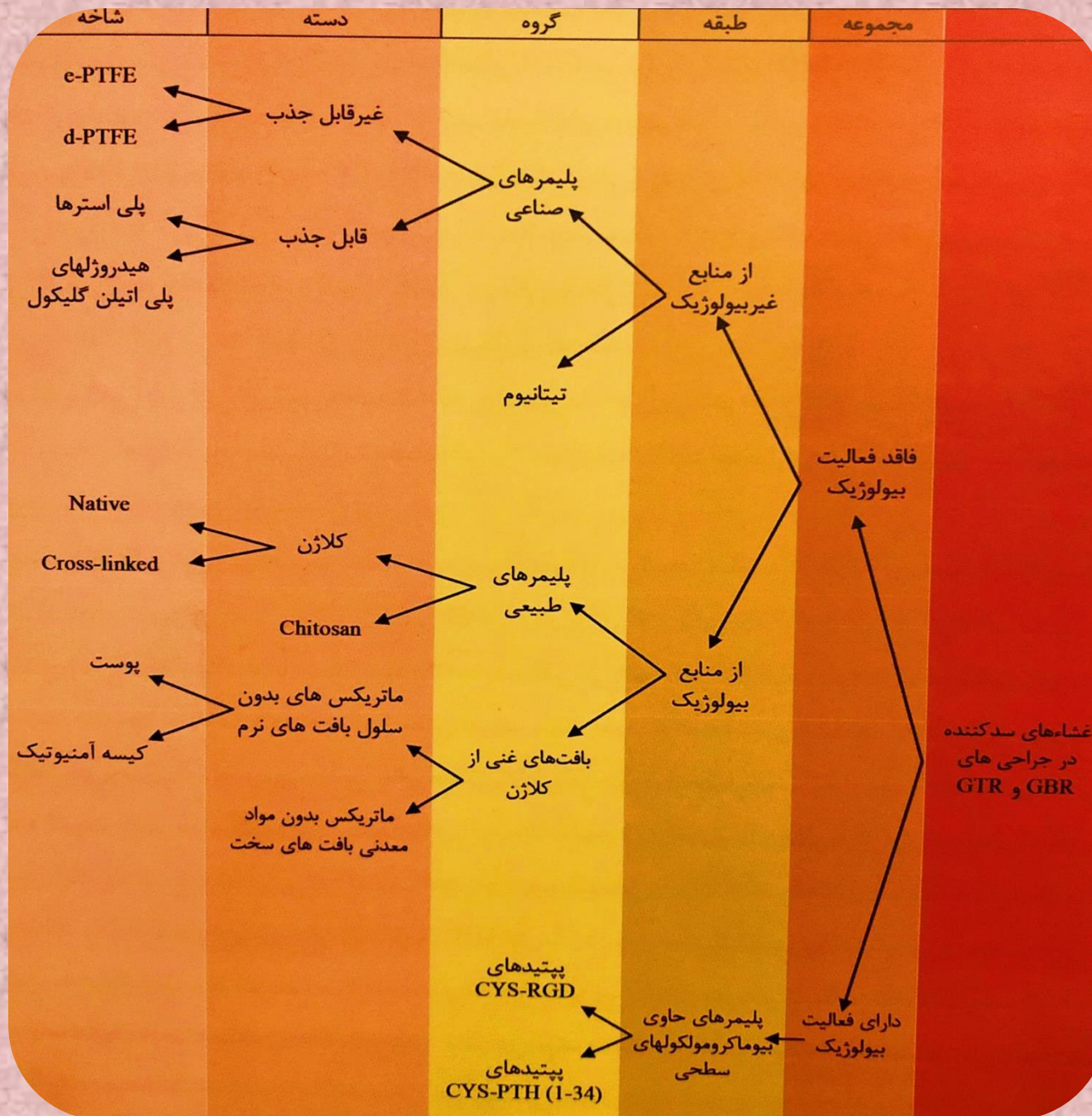
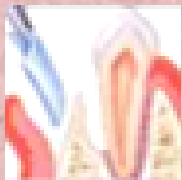
High Cost

Instability of barrier

Biodegradation rate cannot be controlled

Lack of stiffness-collapse of membrane





غشاءهای سدکننده در جراحی‌های GTR و GBR

