

RETROGRADE FILLING MATERIALS INTERFACES WITH DENTIN & IT'S IMPACTS

OBJECTIVES:

To evaluate various retrograde filling materials and their interaction with dentin, with a focus on sealing ability, biocompatibility, and bonding strength.

CHALLENGES AT THE DENTIN INTERFACES

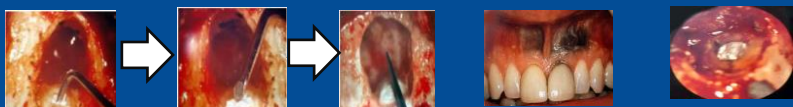
Dentin Bonding:

1. One of the most critical factors in retrograde fillings is achieving a strong bond between the material and the dentin.
2. Proper surface preparation (cleaning and roughening of the dentin) is necessary to improve bond strength.

Sealing Ability:

1. Marginal leakage at the interface between the retrograde material and dentin is a leading cause of treatment failure.
2. Materials like MTA and composites are known to provide better sealing properties compared to amalgam.

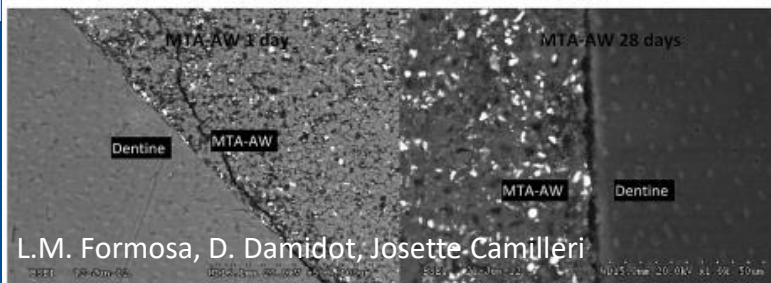
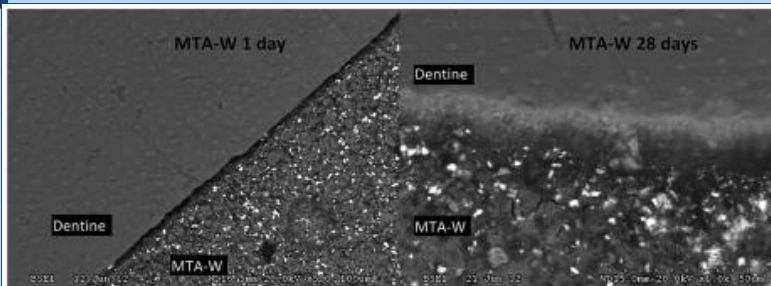
Amalgam is no longer the material of choice for root fillings, because of their toxicity, corrosion, tissue discoloration, microleakage



MTA known to form chemical bond with dentin with formation of apatite crystals. It releases calcium and phosphate ions, forming chemical bonds with dentin and sealing ability is superior to most retrograde filling materials.



Several modifications in MTA and materials have evolved recently, one such is anti-washout gel it reduced the setting time of the cement and enhanced the compressive strength the **anti-washout-type MTA** can be considered to be a suitable substitute for ordinary MTA in all its indications.



L.M. Formosa, D. Damidot, Josette Camilléri

Biodentine and **Bioaggregate** are better material of choice for the retrograde filling to prevent microleakage.

Biodentine forms a calcium silicate hydrate (C-S-H) matrix upon setting, which interacts with calcium ions from the dentin, facilitating a chemical bond. Clinical impacts of the materials are as follows :-sealing ability etc. The interface between Biodentine and dentin often shows the formation of a layer known as the "interfacial layer,"



Capasio has mineralization capacity and when used as root end filling material will likely penetrate the dentinal tubules. It is composed primarily of bismuth oxide, dental glass and calcium aluminosilicate with a silica and polyvinyl acetate-based gel.

Capasio tags are seen penetrating into the dentinal tubules. Penetration of Capasio into dentinal tubules was observed at all levels

Castor oil polymer presented as efficient sealing ability showing better results than MTA & GIC.

Conclusion The newer materials that have emerged in recent times that have challenged the traditional concepts of retrograde cavity and filling. Mineral trioxide aggregate (MTA) remains the gold standard retrograde filling material in periapical surgery. **Future research** :- Developing newer materials that are more biocompatible, durable, capable for forming stronger bonds with dentin like capasio, castor oil polymer

References : de Martins GR, Carvalho CA, Valera MC, de Oliveira LD, Buso L, Carvalho AS. Sealing ability of castor oil polymer as a root-end filling material. J Appl Oral Sci. 2009 May-Jun;17(3):220-3. Bird DC, Komabayashi T, Guo L, Opperman LA, Spears R. In vitro evaluation of dentinal tubule penetration and biomineralization ability of a new root-end filling material. J Endod. 2012 Aug;38(8):1093-6. Kim JR, Nosrat A, Fouad AF. Interfacial characteristics of Biodentine and MTA with dentine in simulated body fluid. J Dent. 2015 Feb;43(2):241-7.

