

## Annotation

Retrograde root-end filling is a crucial step in periapical surgery that ensures the hermetic sealing of the apical part of the root after resection[1]. The success of this procedure depends on the physicochemical and biological properties of the materials used[2]. This study compares the effectiveness of six different retrograde filling materials — Mineral Trioxide Aggregate (MTA), Super-EBA, Intermediate Restorative Material (IRM), amalgam, glass ionomer cement (GIC), and composite resin — in terms of their sealing ability, biocompatibility, and adaptation to dentinal walls[3].

## Materials and methods

**Samples:** 60 extracted human single-rooted teeth were used.

**Procedure:** The apical 3 mm of each root was resected at a 90° angle to the long axis, and a 3 mm retrograde cavity was prepared using ultrasonic tips.

**Groups:** The specimens were divided into six groups according to the material used for filling (n=10 per group):

MTA

Super-EBA

IRM

Amalgam

Glass ionomer cement (Fuji IX)

Light-cured composite resin

## Purpose of study

To evaluate and compare the sealing ability, biocompatibility, and clinical performance of MTA, Super-EBA, IRM, amalgam, glass ionomer cement, and composite materials when used for retrograde root-end filling in endodontic surgery.

## Result of study

MTA showed the best sealing and biocompatibility. Super-EBA and IRM had moderate sealing with good adaptation.

Amalgam showed high microleakage and poor adhesion. Glass ionomer cement provided fair sealing but was moisture-sensitive. Composite resin offered good initial sealing but shrank over time.

## Conclusion

MTA remains the most effective retrograde filling material due to its excellent sealing ability and biocompatibility.

Super-EBA and IRM are acceptable alternatives, while amalgam and composite resins are less suitable for long-term outcomes..



## References:

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