Is MTA an effective root-end filler for endodontic surgery?

Is mineral trioxide aggregate an effective root-end filling material in endodontic surgery?

Lindeboom JA, Frenken JW, Kroon FH, van den Akker HP. ***A comparative prospective randomized clinical study of MTA and IRM as root-end filling materials in single-rooted teeth in endodontic surgery. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2005; 100:495–500***

Design This article reports on a randomised controlled trial.

Intervention Subjects undergoing endodontic surgery of single rooted teeth were randomised to have the resected root apex filled with either mineral trioxide aggregate (MTA; Dentsply, Tulsa Dental, Tulsa, Oklahoma, USA) or IRM® (Intermediate Restorative Material) (Dentsply International, Milford, Delaware, USA). Radiographs were taken at 1 week, 3 months and 1 year after surgery using the long-cone paralleling technique.

Outcome measure Radiographic healing was classified as: group 1 (complete healing); group 2 (incomplete or scar healing); group 3 (uncertain healing) and group 4 (unsatisfactory healing). Clinical success was defined as absence of symptoms, swelling, sinus tract or other signs of infection, in combination with radiographic healing (group 1 or 2) and normal functioning of the tooth.

Results No statistically significant differences were found between results from the two retrofilling materials with 64% of those in the MTA group showing complete healing and 50% in the IRM groupin primary molars.

Table1. Proportion of subjects classified in each outcome-group

	Complete healing	Incomplete healing	Unsatisfactory healing	Failure
Mineral trioxide aggregate	64%	28%	6%	2%
Intermediate Restorative Material	50%	36%	14%	0%

Conclusions The study indicates no statistically significant differences in success rates between use of MTA and IRM as apical sealants in single-rooted teeth.

Commentary

There is a wide selection of retrograde root-filling materials for periradicular surgery and there are correspondingly wide opinions about the most appropriate choice, therefore. Numerous restorative materials have been put to the test but, as yet, the ideal material remains elusive. IRM is commonly employed because of its ease of use, biocompatibility and cost efficiency. More recently, MTA has been advocated as the material of choice, although its difficult handling properties and expense are offputting to some clinicians.

This study aimed to evaluate the clinical efficacy of MTA in comparison with IRM as a retrograde filling material: as such, this is a welcome addition to the existing literature. The simple study design was intended to assess the clinical and radiographic success of the two materials when utilised during single-rooted periradicular surgery in 100 consecutive patients.

The article gives a good overview of radiographic outcomes, which will benefit many clinicians. Two independent assessors judged the radiographic success at 1 year according to the classification by Rud et al.[1] and Molven et al.[2] These results are summarised in a single table that is difficult to interpret, however. Unfortunately, the article is also unclear about the markers used in the trial to judge clinical success. This lack of clarity brings into doubt the conclusion that MTA and IRM had the same clinical effectiveness. Finally, the authors state that MTA scored 92% success and IRM 86%, a difference that was not statistically significant, but the source of these figures remains unknown to the reader.

In conclusion, this article raises more questions than it answers and therefore will only add to the confusion over the ideal retrograde root filler.

Practice points

- Clearly identify and record pre-operative signs and symptoms before undertaking periradicular surgery.
- Careful comparison of pre- and post-operative clinical findings and radiographs will allow determination of surgical success.

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