The Effect of Apical Preperation Size on the Success of Regenerative Endodontic Treatment in Mature Teeth with Apical Periodontitis: A Randomized Clinical Trial

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NCT number: Not applicable

STUDY PROTOCOL

This study was designed as a prospective, randomized, controlled, single-center clinical trial. Participants were randomly assigned to two intervention groups based on apical preparation size.

Participants

A total of 36 patients with mature permanent teeth diagnosed with apical periodontitis were included in the study. All participants met the predefined inclusion and exclusion criteria and provided written informed consent before treatment.

Interventions

Participants were randomly assigned to one of two groups:

MAF 40 Group: Regenerative endodontic treatment with apical preparation completed to ISO size 40.

MAF 80 Group: Regenerative endodontic treatment with apical preparation completed to ISO size 80.

All procedures were performed by the same clinician following a standardized protocol that included root canal disinfection, placement of platelet-rich fibrin (PRF) as a biological scaffold,

and coronal sealing with mineral trioxide aggregate (MTA). Clinical and radiographic evaluations were performed at baseline, 6 months, and 12 months after treatment.

Primary Outcome Measures

Primary Success: Clinical and radiographic success of regenerative endodontic treatment assessed by absence of clinical symptoms and radiographic healing of the periapical lesion.

Secondary Success: Secondary success was defined as the recovery of pulp sensibility, evaluated using cold and electric pulp tests during follow-up examinations.

Secondary Outcomes Measures

- Postoperative pain assessed using a visual analogue scale (VAS)
- Periapical lesion area measured using digital radiographic analysis
- Mean gray value analysis for bone density changes
- Fractal dimension analysis for trabecular bone architecture