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Endodontic Surgery for Separated Instrument Removal

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ADMINISTRATIVE INFORMATION

Support - No support.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2024110118

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 November 2024 and was last updated on 28 November 2024.

INTRODUCTION

Review question / Objective What evidence supports the effectiveness of surgical approaches in endodontics for the removal of retained fractured instruments?
What are the tangible advantages of surgical endodontic techniques compared to non-surgical treatments aimed at removing or bypassing a separated instrument?
What strategies are employed in surgical endodontics for the removal of fractured endodontic instruments?

Condition being studied The fracture of endodontic instruments within root canals, although relatively rare in individual treatments, represents a significant issue given the increasing number of treated teeth. The success rate of removing fractured instruments decreases significantly when they are located beyond the canal's natural curvature or near the root apex. The presence of fractured instruments within the canal system negatively impacts the success of orthograde endodontic treatment, hindering proper cleaning and shaping of the apical root canal, especially in teeth with periapical lesions. Consequently, instrument removal is generally the preferred option. However, when removal is not feasible, bypassing the fragment and incorporating it into the root canal filling material can be a viable alternative. In specific cases, periapical surgical interventions may be employed.

METHODS

Participant or population Patients who have separated instruments inside the roots and who have undergone surgical endodontic treatment for the removal.

Intervention Surgical endodontic treatment for the removal of separated instruments.

Comparator Orthograde endodontic treatments.

Study designs to be included Retrospective studies, Randomized trials, Case control studies, Case series, Case reports, Cohort studies, Prospective studies.

Eligibility criteria The reviewer aimed to identify all clinical trials, Retrospective studies, Randomized trials, Case control studies, Case series, Case reports, Cohort studies and Prospective studies related to the removal of separated instruments within endodontic canals through an endodontic surgical approach. The exclusion criteria included clinical studies that did not provide data on the removal of endodontic instruments from canals using a surgical approach, as well as studies lacking an abstract in English. Additionally, all literature reviews were excluded from the selection process.

Information sources The search for articles and reports was conducted by two reviewers, who are also the authors of the manuscript, using online search engines. Preliminary exclusion criteria included language restrictions: reports without at least an abstract in English were excluded using automated tools integrated into the databases. The main sources used for the search were PubMed, Scopus, and the Cochrane Library. Additionally, a gray literature search was performed using Google Scholar, Science Direct, and Open Gray. To further minimize the risk of publication bias, references from previous reviews on the removal of separated endodontic instruments were also examined.

Main outcome(s) The primary outcome is to identify the success rate of removal of endodontic instruments through endodontic surgery.

Quality assessment / Risk of bias analysis The risk of bias will be assessed using a specific tool for case reports: the JBI Critical Appraisal Checklist for Case Reports, and the ROBINS for trials and retrospective studies, while the Newcastle-Ottawa Scale will be used for case controls.

Strategy of data synthesis The data will be summarized in tables and represented through forest plots.

Subgroup analysis An analysis of the subgroups is planned based on the surgical removal techniques adopted.

Sensitivity analysis A sensitivity analysis is foreseen based on the sources of heterogeneity.

Country(ies) involved Italy.

Keywords Endodontic; Endodontic Surgery ; Fractured; Retreatment; Ultrasonic; separated; Broken; Failure endodontic; Instrument endodontic.

Contributions of each author

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