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INPLASY

Efficacy and safety of regenerative periodontal therapy on the recovery after surgical removal of impacted third molars: A systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 29 April 2025 and was last updated on 29 April 2025.

INTRODUCTION

Review question / Objective This study aims to assess the efficacy and safety of RPT in the recovery after the extraction of impacted third molars using a meta-analysis approach.

Condition being studied After the extraction of impacted third molars, due to the relatively large surgical wound, it is likely to cause local tissue damage, along with symptoms such as bleeding, swelling, and pain. Regenerative periodontal therapy (RPT) aims to promote the regeneration and repair of tissues such as the alveolar bone, periodontal ligament, and gingiva after tooth extraction, and restore the normal structure and function of the periodontal tissues. However, there was inconsistent results regarding current studies for the therapeutic effects of RPT.

METHODS

Search strategy ((((“molar, third” [MH] OR third molar* [TIAB] OR wisdom teeth* [TIAB] OR wisdom tooth* [TIAB] OR 3rd molar* [TIAB])) AND ((“tooth extraction” [MH] OR extraction* [TIAB] OR removal* [TIAB] OR exodontia* [TIAB]))) AND ((“regeneration” [MH] OR “wound healing” [MH] OR “guided tissue regeneration, periodontal” [MH] OR “bone substitutes” [MH] OR guided bone regeneration* [TIAB] OR “autografts” [MH] OR “allografts” [MH] OR xenograft* [TIAB] OR alloplastic* [TIAB] OR “membranes, artificial” [MH] OR membrane* [TIAB] OR barrier* [TIAB] OR growth factor* [TIAB] OR “platelet-derived growth factor” [MH] OR platelet* [TIAB] OR platelet-rich fibrin* [TIAB] OR “platelet-rich plasma” [MH] OR enamel matrix protein derivate* [TIAB] OR emdogain* [TIAB])).

Participant or population Systemically healthy patients who need to undergo the extraction of impacted third molars.

Intervention Performing RPT (including platelet-rich concentrate [PRP], guided tissue regeneration [GTR], bone grafting, guided bone regeneration [GBR] and other regenerative techniques).

Comparator Standard treatment regimen or spontaneous healing group.

Study designs to be included RCT.

Eligibility criteria The inclusion criteria for the trials were set as follows: (1) research subjects: systemically healthy patients who need to undergo the extraction of impacted third molars; (2) intervention measures: performing RPT (including platelet-rich concentrate [PRP], guided tissue regeneration [GTR], bone grafting, guided bone regeneration [GBR] and other regenerative techniques); (3) control settings: standard treatment regimen or spontaneous healing group; (4) outcome indicators: CAL gain, PD reduction, alveolar bone level (ABL) gain, and the incidence of adverse events; and (5) research type: limited to RCT.

Information sources PubMed, Embase, Web of Science, and Cochrane Library.

Main outcome(s) CAL gain, PD reduction, alveolar bone level (ABL) gain, and the incidence of adverse events.

Quality assessment / Risk of bias analysis Risk of Bias Assessment Tool of The Cochrane Collaboration.

Strategy of data synthesis For the continuous efficacy indicators of the RPT, the weighted mean difference (WMD) and its 95% confidence interval (95%CI) were used to estimate the effect size; for the adverse events of the dichotomous variable type, the odds ratio (OR) and its 95%CI were selected to quantify the risk. The DerSimonian-Laird Random-Effects Model was used to calculate the combined effect value. This model adjusts the weight distribution by introducing the between-study variance (τ^2), which can effectively correct the heterogeneity bias caused by different research designs and population characteristics.

Subgroup analysis Subgroup analyses were performed to assess the effects of RPT according to intervention, and the difference among subgroups were compared using interaction test, which assuming that the data followed a normal distribution.

Sensitivity analysis The Leave-one-out method was used to conduct a sensitivity analysis to verify the robustness of the results. The specific process includes: Removing a single included study one by one; Recalculating the combined effect size and its 95%CI; Comparing the differences in the effect size between the original model and the iterative model; Evaluating the influence of key studies on the overall results. If any of the following situations occur after removing any study, the results are determined to be unstable: The direction of the effect is reversed; The absolute value of the effect size changes by ≥20%; The statistical significance level crosses the critical value. After systematic verification, the results of all sensitivity analyses have not exceeded the preset stability threshold, confirming that the conclusions of this study have methodological robustness.

Language restriction No restriction.

Country(ies) involved China.

Keywords regenerative periodontal therapy; impacted third molars; systematic review; meta-analysis.

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