International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

INPLASY202560094

doi: 10.37766/inplasy2025.6.0094

Received: 23 June 2025

Published: 23 June 2025

Local interventions to reduce postoperative complications following mandibular third molar surgery: a systematic review of randomized clinical trials with low risk of bias

Canellas, JV; Ritto, FG.

Corresponding author:
João Vitor Canellas

joao.canellas@unb.br
canellas@inplasy.com

Author Affiliation:
University of Brasília.
Research & Development
INPLASY, Inc.

ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202560094

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 23 June 2025 and was last updated on 23 June 2025.

INTRODUCTION

Review question / Objective The object of this study is to compare different local techniques used to reduce postoperative complications following mandibular third molar surgery. It seeks to clarify the strength of the existing scientific evidence supporting each intervention, thereby guiding the academic community toward safer and more effective clinical practices. Furthermore, the study seeks to identify gaps in the literature to guide future randomized clinical trials in this domain.

Rationale Mandibular third molar surgery is one of the most common surgical procedures performed by oral and maxillofacial surgeons. While this surgery is routinely conducted, it is often associated with postoperative complications, including pain, swelling, and functional limitations. Therefore, investing in studies that exemplify local interventions performed during or immediately after the surgery to reduce these complications is essential for improving postoperative management and enhancing patients' quality of life immediately following the surgery.

Currently, several local techniques for reducing postoperative complications in mandibular third molar surgery can be found in the scientific literature. However, with a large number of methods available and the low methodological quality of the available clinical trials, it can be challenging to identify a validated approach that demonstrates a significant clinical impact. Furthermore, due to a lack of adequate knowledge, surgeons may indicate therapies without scientific support, leading to unpredictable clinical results and unnecessary additional interventions. Thus, the present study aims to analyze only well-designed randomized clinical trials to classify different methods for reducing postoperative complications in mandibular third molar surgery, categorizing the interventions according to their effectiveness in reducing postoperative complications. To this end, the study will combine the evidence from randomized clinical trials with low risk of bias to determine which of the available methods produces the best results. Thus, the

findings will be of great value to the scientific community, as they will also serve as a basis for future research in this domain.

Condition being studied Local interventions to reduce postoperative complications after mandibular third molar surgery.

METHODS

Search strategy The following search strategy will be applied in PubMed: ((((((((((Randomized controlled trial[Publication Type]) OR controlled clinical trial[Publication Type]) OR randomized[Title/Abstract]) OR placebo[Title/Abstract]) OR randomly[Title/Abstract]) OR trial[Title])) OR "Clinical Trials as Topic"[Mesh:NoExp])) NOT ((animals[MeSH Terms]) NOT humans[MeSH Terms])) AND (((((((((molar, third[MeSH Terms]) OR (tooth, unerupted[MeSH Terms])) OR (tooth, impacted[MeSH Terms])) OR (tooth extraction[MeSH Terms])) OR ("wisdom tooth")) OR ("wisdom teeth")) OR ("3rd molar")) OR ("third molar")))) AND (((((((acute pain[MeSH Terms]) OR (pain[MeSH Terms])) OR (pain management[MeSH Terms])) OR (pain)) OR (edema[MeSH Terms])) OR ("facial swelling")) OR (edema)) OR (swelling)). This search strategy will be replicated in Embase, Cochrane Library, Scopus, and Web of Science, according to the supplementary material attached.

Participant or population Health patients requiring mandibular third molar surgery. No other restrictions on sex, gender, or ethnicity were placed on the population of the study.

Intervention No restrictions will be applied. We will include any local interventions administered during or immediately after surgery that aim to reduce postoperative inflammatory complications.

Comparator Different interventions will be compared against each other and with placebo or no treatment group.

Study designs to be included Studies in humans, including only randomized clinical trials with low risk of bias according the revised version of the Cochrane risk of bias assessment tool for randomized trials (RoB 2).

Eligibility criteria Studies will be selected according to the PICOS criteria (Participant, intervention, comparator, outcomes, and study design) outlined in the referred sections. Additionally, we will exclude studies without full-text, and studies comparing systemic interventions, such as the use of different pharmacological protocols.

Information sources We will search the following electronic bibliographic databases: EMBASE, PubMed, Cochrane Central Register of Controlled Trials (CENTRAL), Scopus, and Web of Science. The reference lists of the articles identified will be cross-checked. Furthermore, studies from the 'grey literature' will be screened through the following trial registry platforms: Current Controlled Trials (http:// www.controlled-trials.com), ClinicalTrials.gov (http://www.clinicaltrials. gov), and EU Clinical Trials Register (https:// www.clinicaltrialsregister.eu/ctr-search/search). A manual search will be done in the relevant journals of dentistry. If necessary, the searches will be re-run just before the final analyses, and further studies will be retrieved for inclusion.

Main outcome(s) Pain and edema measured by any validated tool during the postoperative period.

Additional outcome(s) We will include any additional clinical outcome related to bone or soft healing. Similarly, if available in included studies, surrogate outcomes used as substitutes for clinically meaningful outcomes will be summarized. Additionally, all adverse events reported will be summarized.

Data management The studies will be imported into Endnote 2025 software (Thompson Reuters, Philadelphia, PA, USA), where duplicates will be automatically removed. All analyses will be performed using the software R version 4.5 or the latest available version for Mac OS X computer system. The package "netmeta" will be used to run network meta-analysis. This package is available from the Comprehensive R Archive Network (CRAN).

Quality assessment / Risk of bias analysis Risk of Bias 2 (ROB2) tool according to the methods described by the Cochrane Collaboration. The assessment of evidence quality will be measured using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) system, which allows the evaluation of the following five domains: (i) risk of bias, (ii) inconsistency, (iii) indirectness, (iv) imprecision, and (v) overall quality of evidence.

Strategy of data synthesis A frequentist network meta-analysis will be performed using direct and indirect evidence from eligible comparisons. We will provide a quantitative and narrative synthesis to summarize the level of evidence of different

methods to prepare platelet-rich fibrin clots. We will provide summaries of intervention effects for each study by calculating standardized mean differences or mean differences in continuous outcomes, and odds ratios or risk ratios in dichotomous outcomes. We will pool the results using a fixed or random-effects meta-analysis based on the heterogeneity. Heterogeneity will be assessed using both the tau² test and the I^2 statistic. We will consider an I^2 value greater than 50% indicative of substantial heterogeneity. The heterogeneity within designs and between designs will be analyzed. Additionally, the assumption of transitivity and similarity based on clinical and methodological characteristics will be assessed. The inconsistency will be explored using the Net Heat Plot. We will also assess evidence of publication bias. The overall ranking of different interventions will be determined by calculating the Surface Under the Cumulative Ranking curve (SUCRA) values.

Subgroup analysis None anticipated at this stage.

Sensitivity analysis None anticipated at this stage.

Language restriction Studies published in any language will be selected.

Country(ies) involved Brazil, United States.

Keywords third molar; postoperative complications; local interventions; pain; swelling; systematic review.

Dissemination plans The findings of this systematic review will be disseminated through different approaches to reach a broad audience of researchers, clinicians, and stakeholders. It will be submitted for publication in a high-impact, international peer-reviewed journal specializing in oral and maxillofacial surgery. Additionally, the results will be presented at relevant national and international scientific conferences to facilitate discussion and collaboration within the scientific community.

Contributions of each author

The team has not yet defined the contribution of each author. We expect to include new authors in the data extraction phase. Students from Master of Science and Extension Project of Oral and Maxillofacial Surgery of the University of Brasilia will be included. The supervision will be performed by the following authors:

Author 1 - João Vitor Canellas.
Email: joao.canellas@unb.com

Author 2 - Fabio Gamboa Ritto.
Email: Fabio-Ritto@ouhsc.edu