

INPLASY

Bone growth in the posterior edentulous mandible with fixed complete denture: Systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

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

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202650110

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 May 2026 and was last updated on 19 May 2026.

INTRODUCTION

Review question / Objective P: Patients with edentulous mandible restored full-arch implant-supported mandibular fixed complete dentures (FCDs) full-arch implant-supported mandibular fixed complete dentures fixed complete denture (FCDs) demonstrating distal cantilever.

I: Posterior edentulous mandible exposed to the distal cantilever of the FCD.

C: Posterior edentulous mandible prior to receiving the distal cantilever of the FCD (baseline).

O: Bone growth in the posterior edentulous mandible underneath the distal cantilever of the FCD.

Condition being studied Is bone growth statistically significant in the posterior edentulous mandible restored with a full-arch implant-supported mandibular fixed complete dentures (FCDs) demonstrating a distal cantilever?

METHODS

Search strategy Electronic search with Medical Subject Heading terms and keywords through Boolean Operators (AND or OR), using the Ovid MEDLINE, Embase, Web of Science, and EBSCOhost Dentistry and Oral Sciences databases and manual search.

Participant or population Patients with edentulous mandible restored full-arch implant-supported mandibular FCDs demonstrating distal cantilever.

Intervention Posterior edentulous mandible exposed to the distal cantilever of the FCD.

Comparator Posterior edentulous mandible prior to receiving the cantilever full-arch implant-supported mandibular fixed complete dentures (FCDs).

Study designs to be included Clinical studies with full text focusing on bone growth in the posterior edentulous mandible restored with full-arch implant-supported mandibular fixed complete dentures (FCDs) FCDs, \geq 1-yr of mean follow-up time, case series with >10 patients, and studies conducted without financial conflict of interest.

Eligibility criteria Full-text articles focusing on bone growth in the posterior edentulous mandible restored with full-arch implant-supported mandibular fixed complete dentures (FCDs), \geq 1-yr of mean follow-up time, case series with >10 patients, and studies conducted without financial conflict of interest.

Information sources Electronic databases, trial registers, and grey literature.

Main outcome(s) Bone growth in the posterior edentulous mandible underneath the distal cantilever of the full-arch implant-supported mandibular fixed complete dentures (FCDs).

Quality assessment / Risk of bias analysis Risk of bias assessment of the included studies will be assessed using the Newcastle-Ottawa Scale system.

Strategy of data synthesis The data of individual studies will be pooled quantitatively, and a meta-analysis will be conducted using the Comprehensive Meta-Analysis software (version 3, Biostat) using a random-effects model to estimate bone growth in the posterior edentulous mandible along with 95% confidence interval (CI).

Subgroup analysis Subgroup analysis includes implant type, retention type, and initial mandibular height as covariates.

Sensitivity analysis Sensitivity analyses will be performed to assess the robustness of the pooled results. First, studies identified as high risk of bias based on the modified Newcastle-Ottawa Scale (NOS) will be excluded from the pooled analysis – specifically, two-arm studies scoring less than 6 stars and one-arm studies scoring less than 4 stars – to determine whether their inclusion influences the overall effect estimates. Second, a leave-one-out analysis will be conducted by sequentially removing one study at a time and re-running the random-effects meta-analysis to identify any single study with a disproportionate influence on the pooled results. Third, sensitivity analysis will be performed separately for one-arm and two-arm studies to assess whether study design affects the magnitude or direction of bone growth estimates in

the posterior edentulous mandible. All analyses will be performed using the metafor package in R version 3.6.2 and Comprehensive Meta-Analysis software (version 3, Biostat). Changes in effect size, 95% confidence intervals, or statistical significance ($P < .05$) across sensitivity analyses will be reported and interpreted as indicators of result robustness.

Country(ies) involved United States.

Keywords Bone growth; bone formation; bone development; bone regeneration; ossification; osteogenesis; edentulous mandible; posterior mandible; fixed complete denture; implant-supported prosthesis; endosseous.

Contributions of each author

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