

INPLASY PROTOCOL

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The authors declare no conflicts of interests.

Effects of immediate and delayed loading protocols on marginal bone loss around implants in unsplinted mandibular implant-retained overdentures: A systematic review and meta-analysis

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Review question / Objective: How do ILP and DLP influence the MBL around implants in the unsplinted mandibular implant-retained overdentures.

Condition being studied: Immediate loading protocol (ILP) has recently been introduced in edentulous management with implant-retained overdentures. However, the treatment efficacy of this new protocol compared to the delayed loading protocol (DLP) is still to be evaluated.

Information sources: Online electronic databases, including PubMed, EMBASE, and CENTRAL (Cochrane Library). Contact with authors. grey literature, including OpenSIGLE, NTIS, clinicaltrials.gov, the ProQuest Dissertation Abstracts, and Thesis database. Hand searching.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 April 2020 and was last updated on 14 April 2020 (registration number INPLASY202040079).

INTRODUCTION

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METHODS

Search strategy: ((overdenture[MeSH Terms]) OR (implant overdenture) OR (IOD) OR (denture overlay)) AND (("Immediate Dental Implant Loading"[MeSH Terms]) OR (immediate loading) OR (delayed loading) OR (conventional loading)) AND (("Controlled Clinical Trial" [Publication Type]) OR (random*) OR (control*) OR (prospective) OR (retrospective)). Online electronic databases, including PubMed, EMBASE, and CENTRAL.

Participant or population: Patients with mandibular edentulism, restored with unsplinted mandibular implant-retained overdentures.

Intervention: Immediate loading protocol for unsplinted mandibular implant-retained overdentures.

Comparator: Delayed loading protocol for unsplinted mandibular implant-retained overdentures.

Study designs to be included: Randomized controlled trials (RCTs), controlled clinical trials (CCTs), prospective and retrospective cohort studies.

Eligibility criteria: Inclusion criteria: a) Clinical studies on human subjects only b) Adult males and females over 20 years of age who had mandibular edentulism restored by unsplinted implant-retained overdentures c) RCTs, CCTs, prospective and retrospective cohort studies d) Studies with a minimum follow-up of 1 year as well as quantitative outcomes of MBL around implants e) Studies comparing outcomes of unsplinted mandibular implant-retained overdentures restored with ILP and DLP f) Studies with details of measuring techniques g) Studies reported in English language only. Exclusion criteria: a) In addition, the following exclusion criteria were employed: b) Case reports, review papers. c) Overdentures retained by a single implant only d) Diameter of implants narrower than 3 mm (mini-implant) e) Multiple studies on the same patient cohorts f) Sample size less than 5.

Information sources: Online electronic databases, including PubMed, EMBASE, and CENTRAL (Cochrane Library). Contact with authors. grey literature, including OpenSIGLE, NTIS, clinicaltrials.gov, the ProQuest Dissertation Abstracts, and Thesis database. Hand searching.

Main outcome(s): Marginal bone loss with a minimum follow-up of 1 year.

Data management: Titles, abstracts and full texts will be independently screened by WL AND HC. Any discrepancies will be resolved by discussion with LS. Data to be extracted: author; year of publication; study design; total number of patient; edentulous region; number of implants (per patient); implant system; torque of implants; attachment type; comparison; number of patients in ILP/DLP; loading time of ILP/DLP; marginal bone loss; drop out (patient).

Quality assessment / Risk of bias analysis: The risk of bias in the included RCTs were evaluated by the Cochrane Collaboration tool (RevMan version 5.3). The Newcastle-Ottawa scale (NOS), as an ordinal star scoring scale, was employed for the assessment of methodological quality of non-RCTs. This evaluation was independently carried out by 2 review authors (W.L. and H.C.). Any disagreements were discussed and finally resolved until consensus was reached.

Strategy of data synthesis: Statistical analyses were performed utilizing the software RevMan (RevMan v5.3, Cochrane Collaboration) and Stata (Stata MP v14, StataCorp LP). To compare MBL of ILP group with that of DLP group, the mean difference (MD) with 95% confidence interval (95% CI) for these continuous outcomes was calculated. The results were provided with a fixed-effect model and it was assumed that all included studies shared a common effect size in this meta-analysis. Statistical heterogeneity was measured by the Chi² statistic and I² statistic on the level of $\alpha=0.10$. And the observed I² value greater than 50% was interpreted as a substantial or considerable heterogeneity.

Subgroup analysis: Subgroups were set according to the attachment types.

Sensitivity analysis: A sensitivity analysis was performed with Stata software, to see if the overall effect would be changed.

Country(ies) involved: China.

Keywords: Implant-retained overdenture; Immediate loading protocol; Delayed loading protocol; Marginal bone loss; Meta-analysis.