Sacco et al. INPLASY protocol 2026110061. doi:10.37766/inplasy2026.11.0061 Downloaded from https://inplasy.com/inplasy-2026-11-0061/

INPLASY

Temporomandibular Joint Reconstruction in Skeletally Immature Patients: Alloplastic Total Joint Replacement versus Autogenous Grafts versus Distraction Osteogenesis

INPLASY2026110061
doi: 10.37766/inplasy2026.11.0061
Received: 16 November 2026
Published: 16 November 2026

Sacco, R.

Corresponding author:
Roberto Sacco

roberto.sacco@uit.no

Author Affiliation:
UiT-The Arctic University of Norway, Department of Clinical Dentistry, Faculty of Health Sciences.

ADMINISTRATIVE INFORMATION

Support - No support.

Review stage at the time of initial registration - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2026110061

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 16 November 2026 and was last updated on 16 November 2026.

INTRODUCTION

Review question / Objective In skeletally under aged patients (≤ 18 years at surgery) who need reconstruction of the mandibular ramus–condyle unit, how do alloplastic total joint replacement, autogenous grafts (mainly costochondral) and distraction osteogenesis compare in the risk of unplanned reoperation, re-ankylosis, growth disturbance, function, pain and complications?

Condition being studied Reconstruction of the ramus–condyle unit (RCU) in a growing child is one of the most demanding problems in craniomaxillofacial surgery. Temporomandibular Joint Reconstruction. In the growing patient, the reconstruction has to restore form and function, prevent re-ankylosis and, ideally, keep up with the growth of the craniofacial skeleton. Several systematic reviews have addressed individual techniques, but none has quantitatively compared the three approaches in skeletally immature patients.

METHODS

Participant or population Skeletally immature patients aged ≤ 18 years at the time of RCU reconstruction.

Intervention Any of the following used to reconstruct the RCU:
1. Alloplastic
2. Autogenous reconstruction
3. Osteo-distraction.

Comparator Another of the three intervention families (head-to-head studies), or no comparator.

Study designs to be included RCTs, non-randomised comparative studies, prospective or retrospective cohorts and case series of any size (≥ 2 eligible patients, no minimum sample size).

Eligibility criteria Any patients ≤ 18 years at the time of RCU reconstruction, or described by the authors as growing / skeletally immature, that have had congenital RCU deficiency due to craniofacial / hemifacial microsomia Pruzansky–Kaban IIB–III, Goldenhar, Treacher Collins, Nager, condylar agenesis or aplasia; TMJ ankylosis (any cause); end-stage JIA; condylar resorption; tumour resection; trauma; failed previous reconstruction and required any or a combination of 1. Alloplastic
2. Autogenous reconstruction
3. Osteo-distraction.

Information sources Any:
• MEDLINE via PubMed
• Embase (Elsevier embase.com or Ovid)
• AMED
• Web of Science Core Collection
• Cochrane Central Register of Controlled Trials (CENTRAL).

Main outcome(s) To estimate and compare the pooled proportion of patients needing unplanned reoperation of the reconstructed ramus–condyle unit after TJR, autogenous reconstruction or DO in skeletally immature patients.

Additional outcome(s) Secondary objectives
1. To estimate and compare the pooled incidence of re-ankylosis (in patients treated for ankylosis).
2. To estimate and compare the proportion of patients with abnormal growth of the reconstructed side (overgrowth, undergrowth, no growth) and the change in ramus height ratio and facial asymmetry.
3. To estimate the change in maximal interincisal opening (MIO), pain and jaw function / diet from baseline to follow-up for each technique.
4. To estimate the incidence of complications (infection, facial nerve injury, donor-site morbidity, graft resorption or fracture, device loosening or failure, heterotopic ossification).
5. To estimate the proportion of patients needing subsequent orthognathic surgery and the total number of surgical procedures per patient.
6. To explore whether aetiology, age at surgery, laterality, prosthesis type, fat grafting and length of follow-up modify outcomes.

Data management Data are extracted into the companion Excel workbook by two reviewers independently. The form is piloted on five studies and refined before use. Discrepancies are resolved by consensus.

Quality assessment / Risk of bias analysis Two reviewers assess risk of bias independently, using the tool that matches the study design. Disagreements are resolved by consensus or a third reviewer. The results are shown as traffic-light and summary plots (robvis).

Strategy of data synthesis Quantitative synthesis is performed when at least three studies per intervention group report the same outcome. Otherwise, results are synthesised narratively following the SWiM guideline. All analyses are performed in R (packages meta and metafor), with two-sided $\alpha = 0.05$.

Subgroup analysis If the extract data will allow a subgroup analysis will be performed.

Sensitivity analysis Sensitivity analyses
• Excluding studies at high or serious risk of bias (or MINORS below the median).
• Excluding mixed-age studies included through the ≥ 80% rule.
• Excluding case series with fewer than 5 patients (because small series are included without a minimum size, their influence is tested explicitly).
• Freeman–Tukey versus GLMM; leave-one-out analysis.
• Restricting to patients ≤ 15 years (girls) / ≤ 17 years (boys) where individual data allow.

Country(ies) involved Norway.

Keywords Temporomandibular Joint Reconstruction, Autogenous reconstruction, Alloplastic total joint replacement, Osteo-distraction, Review.

Contributions of each author

Author 1 - Roberto Sacco - Professor at UiT-The Arctic University of Norway, Department of Clinical Dentistry, Faculty of Health Sciences, Institutt for klinisk odontologi, Det helsevitenskapelige fakultet, UiT Norges arktiske universitet
Email: roberto.sacco@uit.no

Sacco et al. INPLASY protocol 2026110061. doi:10.37766/inplasy2026.11.0061 Downloaded from https://inplasy.com/inplasy-2026-11-0061/