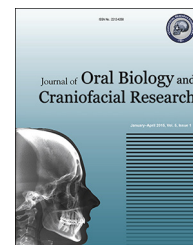


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Review Article

Do costochondral grafts have any growth potential in temporomandibular joint surgery? A systematic review



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ABSTRACT

Purpose of the study: To assess the growth potential of costochondral graft in temporomandibular joint reconstruction in patients with temporomandibular ankylosis and hemifacial microsomia.

Method: Systematic review after inclusion of articles fulfilling the following criteria: (1) only human studies; (2) patients of temporomandibular joint ankylosis and hemifacial microsomia; and (3) studies with minimum of five cases and with a minimum follow-up for a period of 5 years. The primary outcome measure was the percentage of patients with optimum growth of costochondral graft. Secondary outcomes were any abnormal growth and restoration of function. Delphi's criteria were used for assessing the quality of the included studies.

Result: Only three studies satisfied all the inclusion criteria. A total of 96 costochondral grafts were placed in the included studies. Optimum growth was reported in 54 grafts, undergrowth in 1 graft, overgrowth in 7 grafts, lateral overgrowth in 1 graft and no growth in 1 graft. Graft resorption, reankylosis and sequestration were seen in 21, 8 and 3 cases, respectively. When the Delphi's criteria were applied to the case series for the assessment of quality, majority of the studies could be considered as satisfying at least 50% of the criteria.

Conclusion: There are no randomised clinical trials and the only evidence is in the form of case series that is considered as the lowest level of evidence for any study. No inference can be interpreted regarding growth potential of costochondral graft. Thus, on the basis of available evidence, it can be concluded that use of costochondral graft for temporomandibular joint reconstruction lacks scientific evidence.

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1. Introduction

Autogenous costochondral grafts (CCG) are being used extensively for many years in the temporomandibular joint (TMJ) reconstruction.¹ Although these are universally accepted as gold standard for autogenous reconstruction of TMJ, there is controversy regarding its growth potential.² A single school of thought is missing in the context of success of CCG as a growth centre of mandible. Overgrowth, undergrowth or no growth at all have been reported across the literature with no conclusive outcome.² The objective of the present systematic review was to check and review the existing literature for any uniform outcome regarding the indication of CCGs in TMJ reconstruction.

2. Materials and methods

2.1. Focussed question and study objective

The focussed research question was “Do CCGs have growth potential when used for TMJ reconstruction in patients with TMJ ankylosis and hemifacial microsomia?” The objective of this systemic review was to attempt to fill the void in the literature related to the long-term growth potential of CCGs. This knowledge will provide a basis on which the clinician can make decisions in treatment planning.

2.2. Development of a protocol

To investigate the growth potential of CCGs, an extensive search was done to identify longitudinal studies in humans, in

which follow-up of at least 5 years was conducted. The systemic review was carried out in accordance with the steps of practice based on scientific evidence, and the methodology was adapted to the PRISMA statement (Preferred Reporting Items for Systematic Reviews and Meta-Analysis).³

2.3. Search methodology

An electronic search was made of published studies using the PubMed, the Cochrane Central Register of Controlled Trials and Embase using specific Medical Subject Headings and keywords. In PubMed, the search was made using the following search terms: CCG, bone graft, rib graft, TMJ, ankylosis, temporomandibular ankylosis, hemifacial microsomia, facial asymmetry individually or in combination. The Embase search was similarly made using same search terms individually or in combination. In addition, the online databases of the “British Journal of Oral and Maxillofacial Surgery”, “Journal of Oral and Maxillofacial Surgery”, “International Journal of Oral and Maxillofacial Surgery”, “Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics” and “Plastic and Reconstructive Surgery” were searched for studies. Hand searches were also done from reference list of retrieved articles.

2.4. Inclusion criteria

Studies were included only if all the following eligibility criteria were met.

1. Only human studies to be included.
2. Studies that included patients of TMJ ankylosis and hemifacial microsomia.

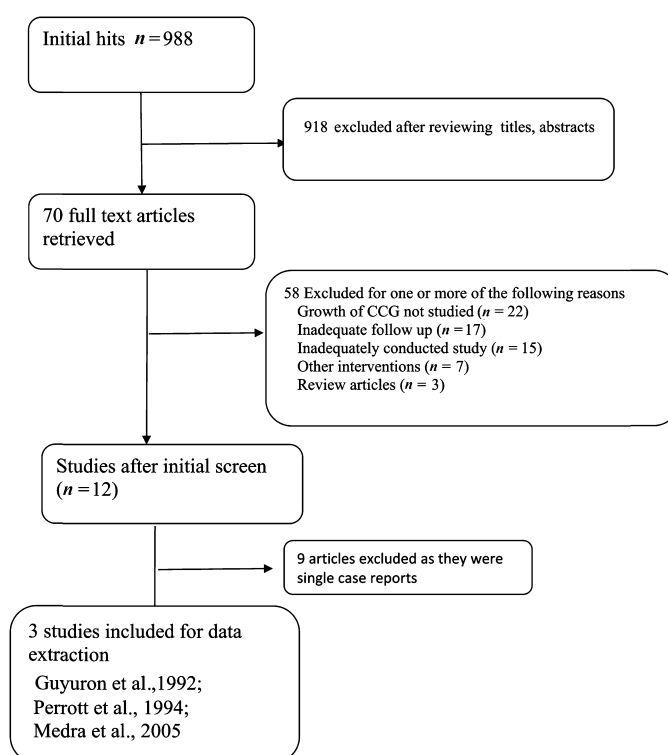


Fig. 1 – Flow chart depicting systematic review of literature with exclusion and inclusion of relevant studies.

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