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Systematic Review Paper
TMJ Disorders

Management-related outcomes and radiographic findings of idiopathic condylar resorption: a systematic review

K. Sansare[1], M. Raghav[1], S. M. Mallya[2], F. Karjodkar[1]
[1]Oral Medicine and Radiology, Nair Hospital Dental College, Mumbai, India; [2]Section of Oral and Maxillofacial Radiology, Division of Diagnostic and Surgical Sciences, University of California at Los Angeles, Los Angeles, USA

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Abstract. Idiopathic condylar resorption (ICR) is progressive resorption of the condyle of unknown aetiology. There is no consensus on the approaches for diagnostic imaging and management of this disease. The objective of this systematic review was to examine the best practices for imaging and to appraise the success of surgical and non-surgical therapy of ICR. Eleven search engines were queried via explicit literature searches for studies describing ICR, published until 2012. Two authors independently extracted data using predetermined characteristics. Studies that identified patients as having either ICR or progressive condylar resorption and that described the radiographic findings or treatment options were included. Seventeen studies contributing 178 cases met the eligibility criteria. The major radiographic findings, as assessed mostly by two-dimensional imaging, included decreased ramus height, decreased condylar height, altered volume of the condyle, decreased SNB angle and mandibular plane angle, and a retrognathic profile. Treatments included occlusal splints with orthodontic treatment, condylectomy with costochondral graft, and other surgical approaches. This systematic review was limited by the lack of meta-analysis. Nevertheless, we identified the need for future investigations: characterization of findings on three-dimensional imaging and its contribution to treatment planning, outcomes of non-surgical and pharmacological management of ICR, and randomized trials and comparative studies with longer follow-up periods.

Key words: condylar resorption; idiopathic condylar resorption; systematic review.

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Idiopathic condylar resorption (ICR) is known by different terminologies including idiopathic condylysis, aggressive condylar resorption, and progressive condylar resorption. ICR is a relatively well-documented but poorly understood condition of the temporomandibular joint (TMJ). Condylar resorption was first reported by Burke in 1961.[1] It was then labelled as acquired condylar hypoplasia. Progressive condylar resorption was first documented as a discrete pathological entity in 1977.[2]

The term progressive condylar resorption appropriately describes the progressive nature of this disease, a hallmark feature of the condition. However, the term ICR has been used more frequently, to underscore the unknown aetiology of this condition. Subsequently, Phillips and Bell reported a case of condylar resorption following sagittal split osteotomy (SSO).[3] The authors speculated that altered biomechanical forces following increased muscular tension led to the resorption. Since then there have been sporadic reports of condylar resorption of unknown aetiology in the literature. Crawford et al.[4] reported seven cases of condylar resorption. Since there was no attributable cause for the condylar resorption, they used the term idiopathic and introduced the terminology of ICR. Arnett et al.[5] proposed that dysfunctional remodelling of the condyle results from either a decreased host adaptive capacity or increased mechanical stresses. They proposed three important categories of factors that determine condylar remodelling: age, systemic factors, and hormonal factors.

Previous studies and case reports of ICR have characterized this disease as a rapidly progressing and extensive condylar resorption that cannot be attributed to known pathological conditions such as rheumatoid arthritis (RA) or osteoarthritis (OA). A diagnosis of ICR is based on patient history, clinical and imaging findings, and appropriate exclusion of known causes. The pathogenesis of ICR remains unknown to date.

Although the clinical manifestations of ICR have been described extensively, the radiographic appearance and its correlation with disease progression or arrest have not been adequately explored. Traditionally ICR has been identified using conventional two-dimensional (2D) radiographic modalities such as panoramic or lateral cephalometric projections, where ICR is recognized as loss of condylar volume. Importantly, there is no clear consensus on the management approaches for this condition. Treatments have ranged from conservative therapy with occlusal splints to invasive surgical approaches for disc repositioning, SSO, condylectomy with costochondral graft (CCG), or a combination of these surgical techniques. Unfortunately, the data on treatment-related outcomes have not provided clear guidelines for the management of ICR. For example, it is important to define imaging protocols, to select such protocols based on specific clinical situations, and to discern specific imaging findings that may contribute to guide management and predict the therapeutic response. Equally important, the selection of suitable treatment approaches and their long-term outcomes have not been defined explicitly. The absence of such evidence-based guidelines makes evidence-based management of ICR challenging.

In this systematic review we collate and critically evaluate the literature on ICR, with specific emphasis on radiographic examination, management approaches, and treatment outcomes. The rationale for this systematic review is to provide information on the current state of knowledge, the limitations of previous studies, and importantly to identify critical gaps in knowledge that could be addressed by future studies. Thus, to examine the best practices for imaging, and to appraise the success of surgical and non-surgical therapy, we reviewed randomized controlled trials and case series that assessed diagnostic imaging and management of patients with ICR.

Materials and methods

Review protocol

This systematic review has been presented in accordance with the PRISMA guidelines for reporting a systematic review.[6] Currently, there are no existing review protocols for ICR. Prior to the start of this systematic review, we defined the search strategy and sources, inclusion/exclusion criteria, methods of data collection and analysis, and the list of data items to be collected. A flow chart describing the identification, screening, and inclusion of studies is shown in Fig. 1.

Eligibility criteria

The study and report characteristics that constituted our eligibility criteria are described below.

Population

We included studies of patients diagnosed with ICR/progressive condylar resorption, or with extensive condylar resorption without any attributable cause. All studies that described condylar resorption due to systemic causes (for example, RA) were excluded.

Types of interventions

We included studies that described radiographic findings and studies that described surgical or non-surgical approaches to manage ICR.

Outcomes assessed

'The geographical distribution, the use of the various imaging modalities and the rationale for their use if stated, and the imaging findings were reviewed'. The successful outcome of therapy, as defined by the number of years of relapse-free follow-up was also reviewed. No constraints were placed on the period of follow-up.

Comparator group

Given the lack of standardized approaches to diagnostic imaging or therapy, the above outcome measures were not compared to a specific diagnostic/treatment approach. Rather, the outcomes from the various diagnostic imaging and treatment groups were compared with each other.

Types of studies

All randomized controlled trials, clinical studies, and case series satisfying the above criteria were included. All single case reports of ICR were excluded; this was because single case reports may not add much information on the radiographic findings and management outcomes.

Report characteristics

Only published studies were considered in this review; unpublished materials were not considered. Reports were considered if they provided sufficient data on the population, intervention, and outcome as detailed above.

Information sources, search strategy, and study selection

This systematic review for ICR was conducted by an explicit search of the literature published until 2012. Two authors (KS and FK) searched the following databases: PubMed, Medline (Pre-Medline and Medline), Cochrane Database of Systematic Reviews (Evidence-Based Medicine), Dentistry and Oral Sciences Source, Access Science, Embase, Evidence-Based Medicine Reviews Multifile, Google Scholar, ISI Journal Citation Reports, LILACS, and Ovid Multi-database. A last search was run on 31 December 2012.

The specific search terms used were 'idiopathic AND condylar AND resorption', 'progressive AND condylar AND resorption', and 'aggressive AND condylar AND resorption'. Whenever needed, the non-English literature was translated using Google translator. Searches were