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Review

Fractures of the mandibular condyle: evidence base and current concepts of management

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Abstract

Management of mandibular condylar fractures remains a source of ongoing controversy. While some condylar fractures can be managed non-surgically, recognition of fracture patterns that require surgical intervention and selection of an appropriate operative procedure are paramount to success in treating these injuries.The objective of this review is to appraise the current evidence regarding the effectiveness of interventions that are used in the management of fractures of the mandibular condyle.

Keywords: Trauma; Mandibular fractures; Condylar injuries; Systematic review

Methods

Search strategy

An electronic search of the literature directly relating to condylar fracture management was conducted. The databases examined were the Cochrane Controlled Trials Register, Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effects and the Health Technology Assessment database. Electronic searches were also conducted of the National Library of Medicine's (NLM) PubMed, Ovid Medline database, Embase, Cumulative Index to Nursing & Allied Health Literature [CINAHL] and Biosis databases up to 2009.

Of 1081 studies and publications identified on the initial search of all databases, 858 were excluded as they were not directly relevant to the subject matter studied. The remaining 233 publications were examined and analysed for the purposes of this review.

Fig. 1 summarises the literature search and selection process in the early stages of the review. The majority of identified literature included case reports and series, descriptions of osteosynthesis techniques, technical notes, letters and editorials. Fig. 2 presents level I and II evidence identified in this review.

Fracture classification as a guide to treatment selection

Classification systems for condylar fractures can offer insight into which fractures might be best treated with open/closed reduction; a usable classification system must be responsive to the contemporary treatment options available to the surgeon.

The lack of consistency in terminology relating to fracture patterns, however, poses a problem associated with the management of these injuries among surgeons and researchers and their reporting in the surgical literature.

Early attempts at fracture classification were rather simplistic and did not help to direct surgical treatment of these injuries beyond closed reduction and maxillo-mandibular fixation.[1–3]

The Lindahl classification considers factors that include the level of fracture, "dislocation" at the point of fracture,

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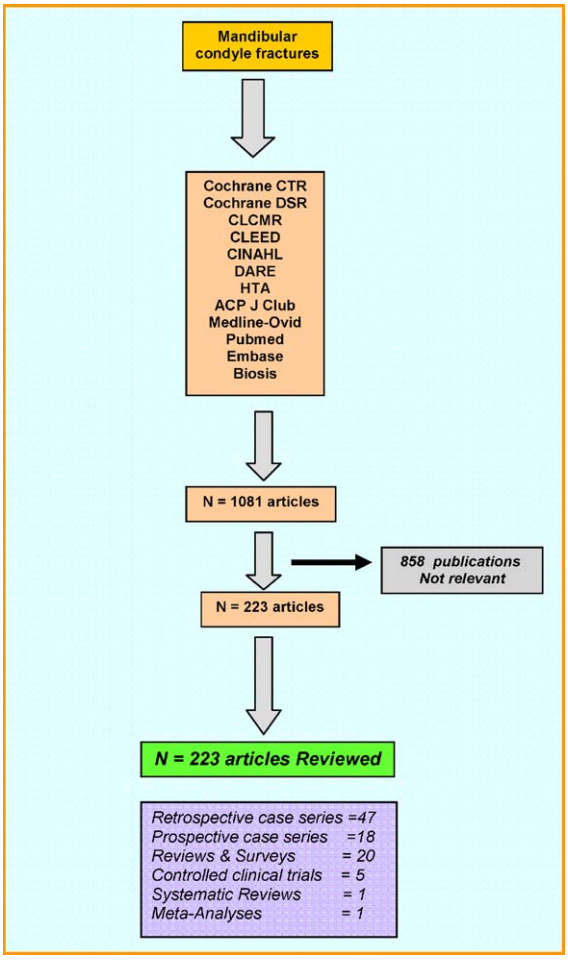

Fig. 1. Search strategy.

and the relationship of the condylar head to the articular fossa. Although useful, this classification system is rather complex.[4]

Similarly the Spiessl & Schroll classification divides condylar fractures into subjectively assessed high and low subtypes, with and without "dislocation", but does not allow easy visualisation of the fracture.[5]

The sub-classification reported by Loukota et al. (Fig. 3), is also adopted by the Strasbourg Osteosynthesis Research Group (SORG).[6] This classification was analysed retrospectively in a cohort of patients with condylar fractures and found to be simple to use and can help predict treatment need and outcome.[7]

The classification of condylar head fractures has been further clarified recently.[36] This should assist and simplify both treatment decision making and standardisation of nomenclature in future work within this field.

Indications for treatment/intervention

In an earlier review of the literature addressing the evolution of treatment modalities, condylar displacement and ramus height instability were considered the only indications for open reduction and fixation of these injuries.

Open reduction and internal fixation (ORIF) was found to provide better functional reconstruction of mandibular condyle fractures than closed reduction (CR) and maxillo-mandibular fixation.[8] In current day practice, fractures with a deviation of more than 10°, or a shortening of the ascending ramus of more than 2 mm, should be treated with open reduction and fixation, irrespective of level of the fracture.[9]

Operative techniques

Surgical techniques, including approaches to the mandibular condyle and ramus have evolved over the last few decades. This is evidenced by the substantial number of reports identified in the searched literature describing the various techniques, both open and endoscopic, used for rigid fixation of condylar fractures.

No trial evidence exists comparing the various approaches described for access to the ramus–condyle region.

Endoscope-assisted ORIF of condylar fractures is now a viable alternative to traditional closed or open reduction techniques and its acceptance continues to grow as more surgeons gain experience. A recent prospective, randomised controlled, multi-center trial concluded that the treatment of condylar fractures with a transoral endoscopically assisted technique is reliable and may offer advantages for selected cases.[19] This included a tendency towards lower occurrence of facial nerve injury, although this was not supported by comparative statistical analyses.

Figs. 4–8 illustrate some of the current osteosynthesis techniques used in condylar fracture fixation.

Assessment scores and outcomes

Several methods, both objective and subjective, have been described for the assessment of outcome following surgery on the temporomandibular joint complex.[10–15]

The Helkimo dysfunction score consists of three indices evaluating anamnestic and clinical dysfunction, occlusion and articulation disturbance. It is an accepted valid and reliable tool used to determine the functional outcome after surgery of mandibular and temporomandibular joint disorders, as well as after orthognathic surgery.[13–15]

As in most surgical disciplines, clinicians managing patients with condylar injuries are responsible for monitoring and recording outcomes of treatment. This should include functional assessments of jaw mobility and excursions (opening, lateral excursion and protrusion), occlusal changes as well as subjective pain and discomfort. This will facilitate future clinical decision making and assist in the standardised dissemination of treatment results.

Although outcome monitoring and reporting should be encouraged using available validated indices/scores, this is not common practice at present.