

Outcomes of treatment for intracapsular fractures of the mandibular condyle: recommendation for a new classification

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Abstract

We know of no universally accepted classification for intracapsular condylar fractures. We propose here a new classification based on the concept of a “disc-condyle” unit, and validate the classification based on outcomes of treatment. From 1 January 2010 - 31 December 2014, 55 patients with unilateral intracapsular condylar fractures were classified into three types: type A has no reduction in mandibular height or displacement of the disc (n=7); type B has displacement of the disc with no reduction in mandibular height (n=17); and type C has reduced mandibular height with or without displacement of the disc (n=31). We treated types B and C by open reduction and fixation, while type A fractures were managed non-surgically. At six month follow-up, we found no significant differences in the vertical height of the ramus, mandibular deviation, protrusion, or lateral protrusion between the fractured and healthy sides. All patients had normal occlusion postoperatively and only one patient (type C) reported pain. Magnetic resonance imaging and computed tomography showed good osseous healing and disc-condylar relations in all cases. Our results show that this new classification of intracapsular condylar fractures is a safe and easy way to obtain satisfactory outcomes of treatment. However, it needs further independent validation.

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Keywords: Intracapsular fracture; condyle; vertical ramus height; articular disc; classification; displacement

Introduction

Management of intracapsular condylar fractures remains a challenge for oral and maxillofacial surgeons, and many papers have been published about both their classification and treatment.^{1–4} Of these, the classification described by Neff et al based on the site of the fracture line and the reduc-

tion in mandibular height, is the most popular, despite others that have emerged over time.¹ Up to now we know of no universally accepted classification.

Two options for treatment, closed and open reduction and internal fixation (ORIF), have been described for the treatment of these fractures. However, which is the best remains controversial. Some authors have suggested that surgical treatment is preferable because it gives better anatomical reduction of both osseous and soft tissues,^{5–9} while others favour non-surgical (closed) treatment, which offers acceptable clinical outcomes without the risk of complications such

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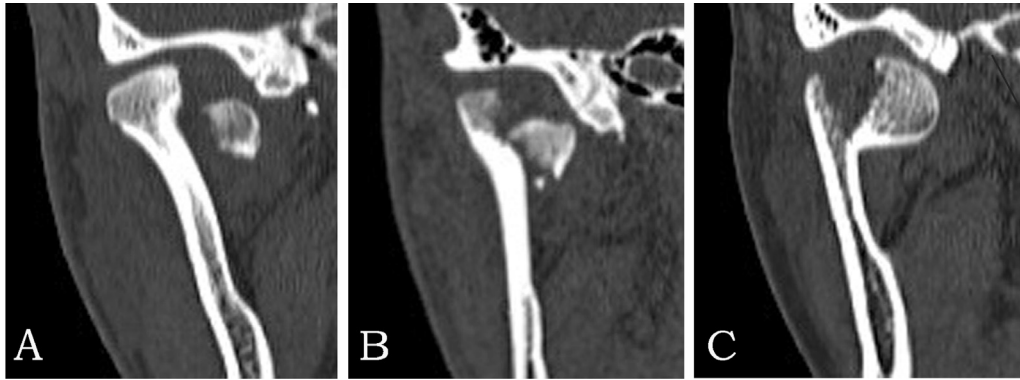


Fig. 1. Classification of intracapsular condyle fracture. A: Type A fracture without loss of height of the ramus or displacement of the disc; B: Type B fracture without loss of height of the ramus, but with displacement of the disc; C: Type C fracture with loss of height of the ramus regardless of the position of the disc.

as damage to the facial nerve, infection, or scarring.^{10,11} It therefore remains difficult to choose an optimal treatment in clinical practice. More importantly, previous reports have also shown that the clinical outcomes are inconsistent, even when the same treatment is used for the same kind of intracapsular condylar fracture, which suggests that their prognosis may also depend on factors other than the site of the fracture line within the mandibular condyle.

The articular disc has a vital role in the function of the temporomandibular joint (TMJ). Intracapsular condylar fractures are always combined with some injury of the surrounding soft tissues, including the articular disc.^{12–15} However, most classifications are based only on the mandibular condyle and its adjacent hard tissue. Without restoration of the position of the disc, the anatomical reduction of the condyle alone cannot ensure full recovery of the functions of the TMJ. Anatomical reduction of the disc is known to be beneficial for the TMJ and decreases the complications of open surgery,¹² which suggests that it is important to restore the disc to its proper position, and the disc and the condyle must be managed as a whole unit. Unfortunately none of the previous classifications has taken the position of the disc into consideration. In this study, therefore, we introduced a new classification of these fractures based on the concept of a “disc-condyle” unit, and considered the displacement of the disc as an independent indicator for open operation in their treatment.

Patients and methods

Patients

All patients with intracapsular condylar fractures who presented to the Center of Orthognathic and TMJ Surgery, West China Hospital of Stomatology, Sichuan University, during the period 1 January 2010 – 31 December 2014 were asked to participate in this prospective study. Patients were informed of the advantages and disadvantages of the open (surgical) and closed (non-surgical) treatments, and were required either to give informed consent or to refuse to participate

in the study. The principles outlined in the declaration of Helsinki were maintained throughout the study. This study was approved by the Ethics Committee of Sichuan University, Chengdu, China.

Inclusion criteria were: age 18 years or more; a unilateral intracapsular condylar fracture with or without other mandibular fractures; sufficient dentition to reproduce occlusal relations; no contraindications to operation, even for the closed treatment group; and the patient gave consent to participation.

Exclusion criteria were: a previous history of TMJ dysfunction; insufficient dentition to reproduce a stable occlusion; severe pretraumatic dysgnathia; the patient refused treatment; and the presence of a contraindication for general anaesthesia.

Classification and treatment of fractures

According to the loss of mandibular height and displacement of the articular disc, intracapsular condylar fractures were classified into three types (Supplemental Fig. S1 in the online version at DOI: [10.1016/j.bjoms.2018.01.002](https://doi.org/10.1016/j.bjoms.2018.01.002)). Type A had no loss of mandibular height or displacement of the disc (Fig. 1A). Type B had displacement of the disc without loss of mandibular height (Fig. 1B), and Type C was characterised by reduction in the height of the mandible with or without displacement of the disc (Fig. 1C). Based on this classification of their fractures, the patients were treated either surgically or non-surgically.

Closed treatment (non-surgical) was used for type A fractures in which there was neither loss of mandibular height nor displacement of the disc, and included intermaxillary immobilisation for two weeks and liquid diet and functional treatment for four weeks.

Open reduction and internal fixation (ORIF) was used for both Type B and Type C fractures in which the height of the mandible was shortened, or the articular disc was displaced, or both. Type B fractures were treated with ORIF if the fragment was large enough, and followed by reduction of the disc. If the fragment was too small to fix, it was removed. For Type

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