

# The Role of Intra-articular Surgery in the Management of Mandibular Condylar Head Fractures

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## KEYWORDS

• Mandibular condyle • Fracture • Condylar head • Diacapitular fractures • Intracapsular

## KEY POINTS

- Treatment of mandibular condyle fractures is still controversial, with surgical treatment slowly becoming the preferred option.
- Fractures of the condylar head (diacapitular fractures) are still treated conservatively at many institutions.
- Open treatment for diacapitular fractures allows restoration of the anatomic position of the fragments.
- Open treatment for diacapitular fractures allows immediate functional movement of the jaw and avoids the ankylosis of the temporomandibular joint induced by trauma.
- Several techniques have been proposed to reduce and fix fractures of the condylar head, including standard bone screws, resorbable screws, and resorbable pins.

## Introduction

The condyle is among the most common sites of mandibular fractures, ranging from 21% to 49% in the literature.<sup>1–20</sup> Treatment of mandibular condyle fractures remains controversial, with surgical treatment slowly becoming the preferred option. However, intracapsular fractures of the condylar head are still treated conservatively at many institutions.<sup>1–3</sup> Fractures of the condylar head are usually treated conservatively because of the difficulty in the exposure and fixation and the risk of facial nerve damage. However, open surgery can give early recovery of occlusion and movement of the jaw.<sup>5,6</sup> Furthermore, extensive condylar deformation, disc displacement, height reduction of the mandibular ramus, temporomandibular joint (TMJ) ankylosis, dysfunctional complaints (such as limitation of mandibular mobility, crepitation, lateral deviation during mouth opening), and occlusal disturbances have also been described after closed or conservative treatment of diacapitular fractures.<sup>7,8</sup> Recently, maxillofacial surgeons have begun to perform open treatment for intracapsular fractures more frequently, because it should allow to restore the anatomic position of the fragments and disc (Fig. 1), as well as an immediate functional movement of the jaw.<sup>9,10</sup> Several techniques have been proposed to reduce and fix fractures of the condylar head, such as standard bone screws, resorbable screws, resorbable pins, and cannulated lag screws.<sup>6</sup>

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## Content

### Classifications

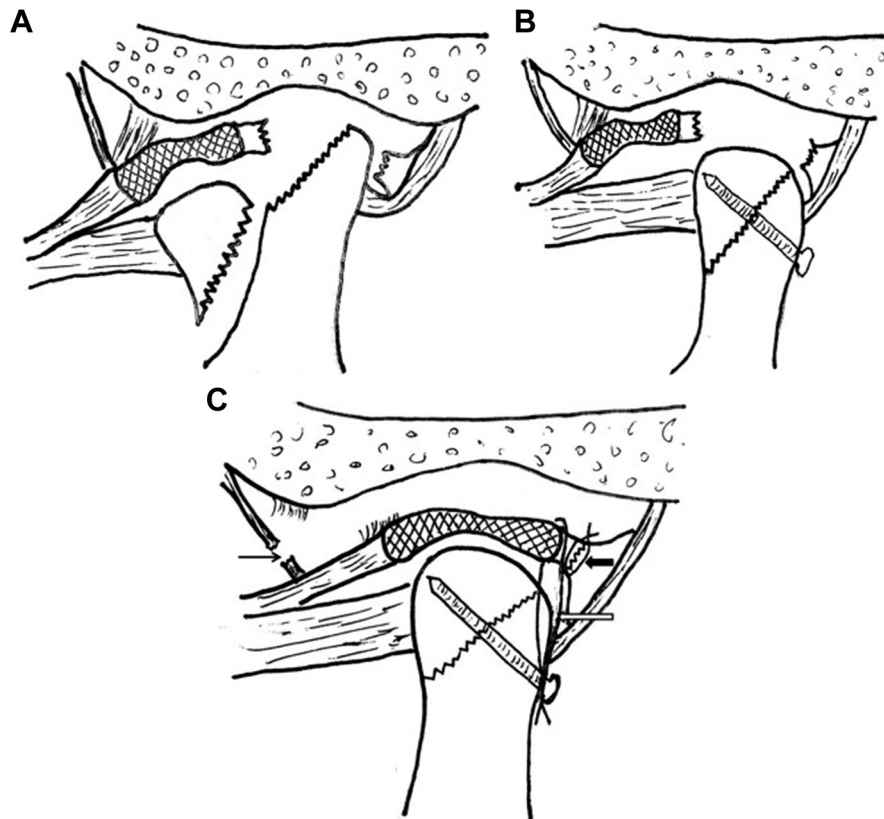
Several classifications have been proposed for intracapsular fractures. According to the classification of intracapsular fractures of He and colleagues,<sup>10</sup> 4 types of fractures can be identified:

- Type A (a fracture line through the lateral third portion of the condylar head with decrease of the ramus height)
- Type B (a fracture line through the central third portion of the condylar head without decrease of the ramus height)
- Type C (a fracture line through the medial third portion of the condylar head without decrease of the ramus height)
- Type M (a comminuted fracture with multiple fragments, usually more than 3, of the condylar head) (Table 1) (Fig. 2).

Another classification was proposed by Neff and colleagues,<sup>11</sup> which classified intracapsular fractures as

- Type A fractures (with displacement of the medial parts of the condyle maintaining vertical mandibular dimensions)
- Type B fractures (affecting the lateral condyle with decrease of ramus height)
- Type M fractures (fractures that include high extracapsular fracture dislocations) (Table 2) (see Fig. 2).

A further classification of intracapsular fractures was suggested by Jing and colleagues,<sup>12</sup> who proposed to divide the posterior plane of the condylar head into 3 vertical sections



**Fig. 1** Intra-articular soft tissue reduction with open treatment of condylar fracture. Constructed profiles of reduction and fixation of condylar fragment and soft tissue. (A) Condylar fragment and disc were typically displaced anteriomedially. Adhesion was formed at superior joint space. Retrodiscal tissue was torn. (B) Osteosynthesis with preservation of the attachment of lateral pterygoid muscle from the condylar fragment. (C) Transecting joint space adhesions and release of the epimysium of lateral pterygoid muscle through an anterior capsulotomy (*thin black arrow*) before the disc was replaced and anchored to the condyle (*thick white arrow*) with suture of posterior attachment (*thick black arrow*). (From Chen M, Yang C, He D, et al. Soft tissue reduction during open treatment of intracapsular condylar fracture of the temporomandibular joint: our institution's experience. *J Oral Maxillofac Surg* 2010;68:2189–95; with permission.)

equally: a medial section, a central section, and a lateral section. Fractures would be distinguished into type M (medial), type C (central), and type L (lateral) according to the location of the fracture line within the sections (Table 3) (Figs. 3 and 4).

Because of these various classifications, it is difficult to obtain a clear picture of the epidemiology of intracapsular fractures types.

**Table 1** He and Yang's classification of intra-articular fractures of the condylar head

Type	Characteristics
A	A fracture line through the lateral third portion of the condylar head with decrease of the ramus height
B	A fracture line through the central third portion of the condylar head without decrease of the ramus height
C	A fracture line through the medial third portion of the condylar head without decrease of the ramus height
M	A comminuted fracture with multiple fragments (usually more than 3) of the condylar head

From He D, Yang C, Chen M, et al. Intracapsular condylar fracture of the mandible: our classification and open treatment experience. *J Oral Maxillofac Surg* 2009;67:1672–79.

## Imaging and surgical planning

Computed tomography (CT) seems to be fundamental for an appropriate diagnosis and assessment of condylar head fractures, as well as for an accurate management planning.<sup>5,10,12</sup> In fact, CT scans show the precise location of the fracture, size and position of the fragment, and the relationship between the ramus stump, fracture segment, and glenoid fossa,<sup>2,10</sup> thus proving to be the gold standard method for the diagnosis and classification of intracapsular fractures<sup>10</sup>(Fig. 5).

MRI can also be used to complete the evaluation of soft tissue changes in the temporomandibular joint (TMJ) after condylar fracture, although in a trauma/emergency setting the patient could obviously present several contraindications (Fig. 6).

Finally, the use of computer-assisted preoperative simulation has been proposed to gain more information about the operative site and simulate the reduction and fixation of the fragment and the stump, thus providing information about the position and the angle of the hole to be drilled and the length of the screw to be placed (Fig. 7).<sup>5,9</sup> Software such as Mimics (Materialise, Leuven, Belgium) and SimPlantTM (Materialise NV) have been used to enable this.

The condylar segments could be virtually repositioned, adjusted, and made as identical as possible to the image of the

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