

Controversies in Maxillofacial Trauma



Daniel J. Meara, DMD, MS, MD, FACS^{a,*}, Lewis C. Jones, DMD, MD^b

KEYWORDS

- Facial fractures • Titanium and absorbable fixation • Timing of surgical repair
- Open versus closed treatment • Antibiotics for facial injuries

KEY POINTS

- The decision regarding open versus closed treatment of mandibular condyle fractures is multifactorial, and patient-specific factors often determine the most appropriate management.
- The evolution of absorbable fixation materials and techniques have made it a viable option in the management of facial fractures, although it must be used with caution in adult mandible fractures.
- Extraction of teeth in the line of fracture is guided by the condition of the tooth and the associated risk of poor healing as well as its impact on bony reduction.
- Current literature suggests that mandible fracture repair outcomes are not improved with immediate versus delayed repair.
- There is little evidence to support the routine use of antibiotics in the treatment of facial wounds and fractures.

INTRODUCTION

Controversies in craniomaxillofacial trauma still exist despite advances in technology, surgical techniques, and peer-reviewed literature. The purpose of this article is to highlight current areas of controversy in facial trauma management and to review the most applicable literature in an attempt to provide some clarity, and possibly resolution, to the presented topics. At minimum, these topics should generate discussion. For many situations and treatments, definitive indications and contraindications do exist. A surgeon, however, is often required to make clinical decisions that lie within the gray zone—where there is no clear indication or contraindication. The result is that the surgeon is required to make a judgment call, and the best surgeons are those who couple the existing scientific literature with clinical experience. This way, the treatment and healing process can move

forward and any subsequent complications can be addressed and anticipated. This is the authors' opinion—and like the rest of these topics, is up for debate.

OPEN VERSUS CLOSED REDUCTION FOR CONDYLAR FRACTURES

Condylar fractures do not plague all facial surgeons—just those who care about restoring patients to optimal occlusion. The debate regarding open versus closed treatment of these fractures has been discussed, and it lives on because there is no single parameter that exists to determine the necessity of an open reduction or acceptability of a closed reduction. Even with regard to closed reduction of condylar fractures, the method for closed reduction (wire vs elastic maxillomandibular fixation) and the length of time in treatment vary. Regardless of the treatment modality,

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^a Department of Oral and Maxillofacial Surgery & Hospital Dentistry, Christiana Care Health System, 501 West 14th Street, Suite 2W40, Wilmington, DE 19801, USA; ^b Department of Surgical and Hospital Dentistry, University of Louisville, 501 South Preston Street, Louisville, KY 40241, USA

* Corresponding author.

E-mail address: dmeara@christianacare.org

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complications can occur. These complications were outlined by Ellis in 1998¹ to include malocclusion, hypomobility, asymmetry, degeneration, and iatrogenic injury.

Few clear indications for open reduction exist. In 1983, Zide and Kent² published the definitive indications for open reduction of a condyle. These include the following 4 conditions:

1. Displacement of the condyle into the middle cranial fossa or external auditory canal
2. Lateral extracapsular dislocation
3. Contaminated open joint wound
4. Inability to obtain adequate occlusion

The first 3 conditions are binary and leave little wiggle room. The last clause, obtaining adequate occlusion, is where the real controversy exists. First, a surgeon has to decide what constitutes "adequate." For the conscientious facial surgeon, the goal is restoration of pre-morbid occlusion, when possible. Some trauma results in loss of teeth and alveolar bone such that restoration of pre-morbid occlusion is no longer possible and the challenge to obtain the best possible result ensues. When there is no loss of dentition or alveolar bone, attaining pre-morbid occlusion should be possible; thus, the need to open a subcondylar fracture to help obtain this occlusion must be determined.

Conservative treatment can avoid the risks associated with open reduction, which includes injury to the branches of the facial nerve, postoperative malocclusion, sialocele formation, and facial scarring. The complication of facial nerve weakness has been demonstrated at 12% to 30% with resolution by 6 months postoperatively.³⁻⁵ Open reduction results have demonstrated sound restoration of occlusion, improved range of motion, and the ability for functional convalescence. Subcondylar fractures should be approached with considerations and principles in mind that help guide the treatment to attain restoration of pre-morbid occlusion and function. The following are considerations in the optimal management of subcondylar fractures:

1. Is it a unilateral subcondylar fracture or bilateral subcondylar fracture?
2. Where is the level of the fracture?
3. Is the fracture displaced?
4. What is the degree of displacement?
5. What is the condition of the remaining dentition?
6. Are there other facial fractures?
7. Is the patient skeletally mature?

Many unilateral fractures can be treated closed with proper follow-up and patient compliance.

Bilateral subcondylar fractures, on the other hand, present more frequently with loss of facial height, resultant apertognathia, and difficulty with restoration of pre-morbid occlusion/function with closed reduction.¹ For the bilateral fractures, open reduction has demonstrated statistically and clinically significant improved function (opening/excursion/protrusion) and occlusion in comparison with closed reduction.⁶

The level of the fracture is assessed to ensure that adequate bone exists on the superior fractured segment to allow for placement of internal fixation. A variety of methods and plates exist for subcondylar fractures, but the bone must be adequate to allow for placement of some form of fixation if the fracture is opened.^{7,8}

Displacement of the fracture is a consideration, because it would be difficult to justify an open procedure for a nondisplaced fracture. Ellis⁹ has demonstrated that degree of displacement (measured on Towne and panoramic views) correlated to the clinical finding of dropback on examination at the time of surgery. This requires correlation of clinical and radiographic examination (with emphasis on the clinical examination) to aid in the determination for the need for an open procedure—the surgeon should also note that even a closed reduction can result in additional displacement.¹⁰

The condition of remaining dentition also has implications in the treatment of subcondylar fractures. Presence of intact posterior dentition aids with maintaining the vertical dimension during the healing period of closed treatment. A lack of posterior teeth can allow for collapse in the vertical dimension and development (or persistence) of a malocclusion.

The presence of other facial fractures, especially in the bilateral subcondylar fracture patient, may require the surgeon to open at least one side to re-establish the vertical dimension of the mandible for facial reconstruction.

A skeletally immature patient has significant healing and remodeling potential.¹¹ Therefore, the initial treatment of these patients is closed treatment if possible.

The decision to open a subcondylar fracture is not always a simple one, but it can be guided by careful thought and consideration of these factors.

TEETH IN THE LINE OF THE FRACTURE

Another conundrum a facial trauma surgeon encounters is when to extract a tooth in the line of a mandible fracture. Some investigators/surgeons have advocated for retention of healthy teeth in

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