A serious complication in the temporomandibular region due to insufficient follow-up

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The aim of this case report is to point out follow-up insufficiency as a contributing factor of ankylosis after condylar fractures as well as the significance of clinicians’ familiarity with this complication and its prevention. Condylar fractures require close follow-up due to the potential emergence of delayed and distressing complications, such as ankylosis, regardless of their proper initial treatment. Regular follow-up for a minimum of 18 months is of crucial importance for the prevention of ankylosis. The clinician’s contribution in alerting his patients could be considerable, given he or she is aware of the development of this complication. The case of a 17-year-old patient with bilateral condylar fractures and a mental fracture is presented. He was successfully treated with mental osteosynthesis and intermaxillary fixation. Strict instructions for kinesiotherapy were given and constant re-examinations were made, but the patient’s compliance was poor. This resulted in his readmission 2 years later with a great limitation of mouth opening (0.5 cm), demanding more serious surgical procedures. Follow-up insufficiency could be identified as a contributing factor to traumatic temporomandibular joint ankylosis. Intense surveillance and harmonious collaboration is dictated from both the clinician and patient to prevent any untoward development. Orthodontics (Chic) 2011;12:134–139.

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Injuries of the oral and maxillofacial region require close follow-up due to the potential emergence of delayed complications, regardless of their proper initial treatment. Condylar fractures are frequent in this region, in both children and adults.¹ The most serious and distressing complication is ankylosis.²⁻⁴ Ankylosis is the development, under predisposing conditions, of a significant or complete restriction of the temporomandibular joint (TMJ) due to a pathologic status of the intra-articular space.⁵,⁶

Treatment of condylar fractures is based on well-evidenced protocols.¹ Regarding the intracapsular and comminuted fractures of the condylar head as well as the high subcondylar ones, the appropriate treatment is 2 weeks of intermaxillary fixation (IMF).¹ Following IMF, continuous and regular follow-up of the patient for a minimum of 18 months is of crucial importance.⁷,⁸
Patients are usually followed by their clinician regarding oral problems; though dentists are not responsible for the management of condylar fractures and their complications, they may have a better knowledge of a patient’s course of treatment after a TMJ injury. Therefore, they should be informed about the significance of constant examination of TMJ mobility in anticipation of the total restoration of its function to alert their patients and properly refer them to an oral and maxillofacial department, where they could be treated in a timely fashion.

We present a case of a patient with bilateral comminuted condylar fractures who developed severe ankylosis due to poor compliance with the instructions and the follow-up protocol, aiming to point out follow-up insufficiency as a predisposing factor of ankylotic development after condylar fractures.

CASE PRESENTATION

A 17-year-old boy with multiple injuries was referred to our department. He presented with fractures to the middle third of the face, a mental fracture, and bilateral condylar fractures and dislocations (Figs 1a and 1b). Upon clinical examination, malocclusion and painful mouth opening were revealed. According to the standard principles of treatment of maxillofacial fractures, open reduction and fixation of the mental fracture and an IMF were carried out under general anesthesia (Fig 2). The IMF was removed 15 days after surgery; simultaneously, mild mandibular movements were recommended.

Ten days later, at the first follow-up visit, satisfactory occlusion and mouth opening were noted. The patient was instructed to continue more intense physical exercises. At the next follow-up 15 days later, the expected improvement in mouth opening was not observed. The necessity of TMJ kinesiotherapy and close observation were emphasized to the patient and his parents. There was an explicit demonstration of the exercises as well. The patient revisited capriciously 25 days later, not at the time we proposed, and had not followed our strict instructions. Still, there was no improvement. Both the patient and his parents were admonished of the danger of ankylotic development, and active physiotherapy was suggested. The patient never returned, in spite of numerous phone calls.
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Two years postoperatively, at the age of 19, he was forced to return, because he was referred by an anesthesiologist to the Department of Oral and Maxillofacial Surgery to restore his mouth opening prior to another operation. Upon clinical examination, a maximal mouth opening of 0.5 cm was registered (Fig 3). Thereafter, proper imaging techniques were performed to reveal the architecture of joint ankylosis (Figs 4 to 6). Thus, a diagnosis of ankylosis was confirmed, and all the required evidence for its surgical release was collected. Macroscopic visualization during the operation revealed an extensive bony mass posteriomedially on the left side and a more confined one on the right. Bilateral interpositional gap arthroplasties were applied (Fig 7). Postoperatively, a satisfactory range of maximal mouth opening of 3.5 cm was achieved (Fig 8), and the appropriate instructions for early mobilization and aggressive kinesiotherapy were given to prevent recurrence. One year later, the patient maintained a stable mouth opening.
Fig 4 (Left) Panoramic radiograph. On the left side, there is anatomical bone continuity between mandibular ramus and malar bone. On the right side, a slight delineation of the glenoid fossa is apparent.

Fig 5 (Right) Sagittal CT scan. The bony union of the condyles with cranium is adequately demonstrated.

Fig 6 3D CT scans. (a) On the left side, the bony fusion is evident. (b) On the right side, there is a slim delineation of the glenoid fossa.

Fig 7 (Above) Panoramic radiograph after the bilateral interpositional gap arthroplasty.

Fig 8 (Right) The patient’s mouth opening 20 days after the management of ankylosis.
DISCUSSION

It has been documented that ankylosis develops through the interaction of several complex molecular and cellular events. In the case of a condylar fracture, the following factors are considered to be involved in the process of ankylosis: the age of the patient, the type of fracture, the duration of IMF, and the damage to the disc.

In the present case, the age of the patient is a leading predisposing factor, given that he is a growing individual.

As far as the type of fracture is concerned, it is reported that apart from the intracapsular and comminuted fractures of the condylar head, such as the fractures of our patient, are also often associated with the complication of ankylosis. Additionally, the combination of the bilateral subcondylar fractures with the limited joint mobility, due to relative pain after the release of IMF, favor the ankylosis process even more. In this case, condylar dislocation created a cavity that was rapidly filled by blood forming a hematoma, which, due to the rupture of the periosteal sheath and articular capsule, extravasated in the surrounding space. Ossification occurred whenever the hematoma was populated by endosseous vessels in the presence of a sufficient degree of immobility. The clinical outcome was the restricted jaw opening. It is worth mentioning that bilateral condylar fractures with a concomitant mental fracture are more prone to develop bony fusion.

To avoid the limitation of jaw movements, IMF should be applied for only 15 days; namely, until the fibrosis process is complete. Then, the mobilization of the TMJ will interfere with ossification.

The disc plays a significant biomechanic role as a barrier in preventing bony hyperplasia between the condyle and the cranium. Inevitably, the extensive damage to the disc and capsule after trauma, in combination with a comminuted condyle and hypomobility, initiates ankylosis. Nevertheless, ankylosis may occur despite the presence of an intact disc.

According to the literature, hypomobility after condylar fractures is common, and an interincisal opening of less than 3.5 cm occurs in around 8% to 10% of patients. Hence, our goal is to advance gradually the motion of the mandible. This requires vigilant surveillance and rigorous physiotherapy to ensure therapeutic success. At the first follow-up visit, our patient’s range of jaw motion was satisfactory, and instructions for functional restoration were given until the next examination 2 weeks later. There was a concern for an imminent ankylosis, and the necessity for adherence to the instructions and close observation was emphasized to the patient. This interval of time (2 weeks) is the most suitable for the appropriate actions to avoid calcification. An overall follow-up period of 18 months is recommended, because it is recognized that limited jaw motion hastens the progress of ankylosis, but once it is established, it progresses at an equal rate with or without immobilization. However, the patient never came for follow-up. This resulted in his reappearance years later with a great limitation of mouth opening (0.5 cm), necessitating an amputating surgical restoration. It is evident that follow-up insufficiency and the patient’s nonconformity resulted in further damage of the structures of the temporomandibular region demanding more serious surgical procedures, regardless of the proper initial treatment.
Conclusively, follow-up insufficiency could be identified as the fifth, late, contributing factor to traumatic TMJ ankylosis. The short duration of IMF, the gradual exercises afterward, the close observation, and the patient’s cooperation are of paramount importance in preventing ankylosis. It is worth mentioning, however, that since the mechanisms of ankylosis are not fully understood, the applied preventive methods may not be the most indicated ones. Intense surveillance is dictated from both the clinician and patient to prevent any untoward process.

REFERENCES