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Self locking zip ties temporary displaced mandibular fracture reduction

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CLINICAL CASE

ABSTRACT

The article addresses mandibular fractures, which are common today, often resulting from traffic accidents, violence and falls. Surgical management is crucial to avoid future complications. The work describes a specific case in which Nylon tape (clip) was used to reduce a mandibular fracture in a male patient who was a victim of physical aggression. The patient, a homeless individual involved with narcotic substances, was treated by neurosurgery and trauma surgery teams. The fracture was initially reduced with nylon tape during primary care. The patient was subsequently transferred to the oral and maxillofacial surgery (BMF) team for definitive treatment. The treatment involved several steps, including nasotracheal intubation, antisepsis, local anesthesia, submandibular surgical access, removal of nylon tape, tooth extraction, cleaning of the fracture, manual reduction, plate fixation and occlusion review. The patient received conventional clinical support and was released on the second postoperative day for outpatient follow-up. The choice of fixation with replaced load of the 2.4 mm system (load bearing) stands out due to the need for high rigidity in contaminated fractures. The extraction of teeth 43 and 44 was carried out to avoid risks of contamination. The article concludes by highlighting the effectiveness and accessibility of using nylon tape for the temporary stabilization of mandibular fractures, providing local pain relief and reducing the distress associated with bone movement.

Keywords: Mandibular Fractures; Maxillofacial Injuries; Open Fracture Reduction.

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INTRODUÇÃO

Mandibular fractures are among the most frequent maxillofacial injuries in the trauma segment[1]. In a study of 1,023 patients, totaling 1,454 mandibular fractures[2], it was found that traffic accidents were the main causes, followed by urban violence and falls. However, although the causes can be varied, surgeons must carry out the appropriate management for each case in order to avoid future complications such as infection and malocclusion[3-5]. With this in mind, the aim of this study is to describe the use of self locking nylon zip ties for the temporary reduction of mandibular fractures already in the emergency room, during the patient's admission.

RELATO DE CASO

A male, African-American patient was referred to the emergency department. He reported having been assaulted 30 minutes previously on a public road. He was preserved temporal and spatial orientation, and his past history did not include systemic pathologies or allergies. He declared that he was homeless and a drug and alcohol user. The patient was admitted to the trauma care system and was assessed by the neurosurgery and trauma surgery teams, who ordered tests and kept him under observation. An oral and maxillofacial surgery (OMF) evaluation was requested, revealing an open fracture of the mandible at the right parasymphysis/body transition (Figure 01). During primary care, the mandibular fracture was cleaned and reduced using self-locking nylon zip ties, under local anesthesia (Figure 02A, 02B).

After exams and discharge from the trauma team, the patient was transferred to the care of the OMF team, who carried out the definitive treatment, consisting of a sequence of procedures: 1. nasotracheal intubation; 2. intraoral and extraoral antisepsis maneuvers with degerming and asepsis using sterile surgical supplies; 3. Local anesthesia with 2% bupivacaine + 1:100,000 adrenaline; 4. Submandibular surgical access, exposure of the fracture edges, removal of the nylon tape, extraction of the 43 and 44 (FDI), vigorous cleaning of the fracture; 5. Manual reduction of the fracture, guided by the Recovery of occlusion; 4. Fixation of the fracture with two plates using the

load bearing locking system (2.4 mm screws) with central space. The upper plate was fixed with four short screws, while the mandibular base plate was fixed with six bicortical screws (image 03); 5. Revision of the occlusion; 6. Suturing by anatomic planes.

The patient received conventional clinical and therapeutic support and was released on the second postoperative day and referred for outpatient follow-up. Contact is currently being made via the social service, awaiting a response. The choice of load-bearing fixation with the 2.4 mm system was justified by the need for high rigidity in patients with contaminated fractures and in uncooperative patients, in order to guarantee absolute stability. The AO philosophy states that it is not recommended to fix screws in contaminated bones, requiring the use of spaced plates. The choice to extract 43 and 44 (FDI) was motivated by the absence of periodontal support and alveolar bone, and their maintenance could compromise the fixation system due to the risk of contamination (figure 04). Figure 05 shows the immediate post-operative period, with preserved facial nerve function and surgical wound.

Figure 01. Open fracture of the mandible at the parasymphysis/right body transition

Figure 02A. Mandibular fracture reduction using self-locking nylon zip

Figure 02B. CT aspect after mandibular fracture reduction

Figure 03. The upper plate was fixed with four short screws and the mandibular base plate was fixed with six bicortical screws 2.4 system. (Toride CMF, Mogi Mirim, Brazil)

Figure 04. Extraction of 43 and 44 (FDI) due to lack of periodontal ligament and alveolar bone support, as well as risk of contamination of the fixation system

Figure 05. immediate post-operative control

DISCUSSION

Self locking nylon zip ties are fastening devices made up of a strip of nylon or similar polymer, usually with a toothed end and a lock. They are used to secure objects, bundle cables, fasten components and make lashings in a variety of situations[6]. The use of nylon straps for fracture reduction and temporary fixation has been documented since the mid-20th century, when they were used to treat femur fractures in a study by Partridge[7].

This stable fixation system ensures the rigidity and stability essential for the correction of contaminated fractures, in accordance with consolidated standards refined by the AO[8] Group. The use of nylon tape for the primary stabilization of mandibular fractures is an accessible, economically advantageous, effective and agile method, which is applied by means of local anaesthesia, antiseptic procedures, passing the tape through the interdental space, checking occlusion, tightening the tape using a needle holder and cutting off the excess. It is important to note that this tape should be used on teeth anchored in the alveolar bone. In the event of mobility of the tooth adjacent to the fracture line, the neighboring tooth is used. In situations characterized by excessively narrow interdental spaces, we used fragments of Erich's bar and steel wire. Antisepsis was carried out with chlorhexidine soap.

FINAL CONSIDERATIONS

This type of temporary immobilization has proven to be effective over time and alleviates the patient's suffering, as it stabilizes the fracture stumps, reduces local pain and mitigates the anguish associated with the sensation of bone movement with each mandibular movement, including during swallowing.

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