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RESEARCH ARTICLE

Isolated Bilateral Coronoid Fracture of the Mandible: A Rare Case Report.

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Manuscript Info

Abstract

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Introduction:-

Fractures of the mandible are relatively common injuries. However, fractures of the mandibular coronoid process are extremely rare constituting about 0.6 to 4.7% of all facial fractures making the coronoid process the least frequently fractured region of the mandible. The paucity of literature on fractures of the mandibular coronoid process reflects the infrequency of occurrence of this injury. Although the coronoid process is a relatively weak part of the mandible, its fracture is difficult due to its depth of location and the coverage of muscle, unless it is a result from direct blunt or penetrating trauma or sudden muscular contraction at the time of impact¹

Coronoid process fractures often result from localized intense forces, in particular in trauma to the zygomatic arch. Hence the premature diagnosis of coronoid fracture have high chances of being associated with zygomatic arch fracture² The zygomatic arch acts as a shield to the underlying mandible and an isolated coronoid fracture is rarely seen in the absence of an arch fracture³

Fractures of the coronoid process may be 'longitudinal' in which the fracture plane traverses the long axis of the coronoid process extending from the apex inferiorly or 'transverse' in which the fracture plane extends from the sigmoid notch or the posterior border of the coronoid process to a point on the anterior border of the ramus or coronoid process⁴

Clarkson et al. first reported coronoid fractures among British troops during World War II in 1946. The clinical findings associated with coronoid fractures include most commonly restricted mouth opening due to adhesions of the fracture segments to the surrounding tissue. Coronoid fractures are frequently managed conservatively. Surgery may be indicated in a few special cases with significant displacement of the coronoid segment or those who are not good candidates for prolonged maxillomandibular fixation (MMF)⁵
This paper presents a rare case of isolated bilateral coronoid fracture.

Case report:-

History:-

A 45-year-old male presented with pain and difficulty in opening jaw following a direct impact to the chin and lower lip region during a road traffic accident (**Figure 1**). Past medical history was noncontributory. Presence of a positive

oral bleed was seen which stopped spontaneously. He was brought by ambulance to the emergency room on the day of injury for evaluation and treatment.

Clinical Examination:-

Positive physical findings were limited to the head and neck and consisted of multiple lacerations and edema to the lower lip, abrasions on the chin and nasal bridge and trismus. A restricted mouth opening of less than 20mm was seen (**Figure 2**). There was presence of anterior and posterior open bite. On palpation tenderness was present over the bilateral TMJ and temporal region. TMJ examination revealed restricted movements of condyles on opening and lateral excursions were limited. Vital signs including a complete blood count, hemoglobin, serology, and urine analysis were within normal limits. Primary care was undertaken.

Radiographic Examination:-

The Orthopantomographic examination revealed a sharply defined radiolucent line extending from the anterior part of the left and right coronoid process of the mandible to the greatest depression of the sigmoid notch confirming the diagnosis of a bilateral transverse fracture of the coronoid process with minimal displacement of the fragments. No skeletal abnormality apart from undisplaced bilateral transverse coronoid fracture was seen. (**Figure 3**)

Treatment Plan:-

Patient was planned for conservative management including elastic traction with the help of arch bars to guide the teeth into occlusion, relaxation of the masticatory muscles with medications, thermotherapy with dry heat for 10 min and manual massage was undertaken. A soft diet was advised.

The elastic traction was removed after 2 weeks. A satisfactory occlusion was achieved. After that mouth opening exercise were initiated. However the patient was lost to follow-up.



FIGURE 1: Patient at the time of admission with laceration of lower lip and abrasions over nasal and right TMJ region

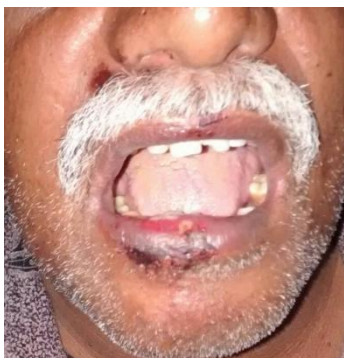


FIGURE 2: Mouth Opening Restricted of <20mm



FIGURE 3: O.P.G X-ray showing bilateral minimally displaced transverse coronoid fractures

Discussion:-

There is little doubt that fractures of the coronoid process are extremely rare injuries. Coronoid fractures associated with other maxillofacial injuries, although not common, occur more frequently. In fractures with minimal initial displacement, further displacement will not occur but when the traumatic force is exceedingly violent, the protective musculature may tear and the fractured coronoid may be displaced into the temporal fossa. The symptoms of coronoid fractures vary according to the severity of the injury. Coronoid fractures usually coexist with other fractures of the zygomatic arch and the mandible. In the majority of these cases the clinical picture predominates the signs and symptoms. The symptoms include trismus, slight to moderate swelling in the region of the zygomatic arch, limitation of mandibular movement and intraorally, there may be swelling or ecchymosis in the soft tissues of the retromolar area, slight malocclusion and jaw deviation.¹

Treatment depends on the severity of symptoms and degree of displacement fractured coronoid. In cases of marked malocclusion with severe pain, intermaxillary fixation for up to 4 weeks will relieve the symptoms and encourage prompt healing. Treatment can be avoided in cases without displacement of segment or malocclusion. The muscular spasm of the temporalis is sufficient enough to hold the fragment in position until healing. If the fragment is large, impedes mandibular function or marked lateral displacement preventing osseous contact with the ramus, intra-oral open reduction and intraosseous wiring can be performed⁶

Kanzanjian and Converse advocated conservative treatment for minimally displaced fractures. Thomas believed that interosseous wiring of the fragment through an intraoral incision along the anterior border of the ramus is necessary. Dingman advocated intermaxillary fixation as minimal treatment. Kruger suggested that with significant displacement, intraoral open reduction and interosseous wiring of the fragment should be accomplished and if reduction of the fragment is not possible, it should be removed⁴

In this case, the bilateral coronoid fracture of the mandible might have occurred due to dual factors which included trauma to the temporal region and the occlusion during multiple high velocity impact with the ground at the time of accident. As the literature supports, the trauma to the temporal region might have caused reflex contraction of both temporalis muscles that inserts into the medial aspect and tip of the coronoid process and the myotactic reflex of this muscle lead to sudden excitation of muscle spindles and reflex contraction of the large skeletal muscle fibres^{7,8}. Thus, in this case, the blow to the temporal region appears to have acted as the initiator for temporalis contraction.

The likelihood of such fractures increase if the teeth are not in occlusion, since mouth closure would be suddenly arrested leading to a substantial stress being applied to the coronoid process which was further confirmed by the patient⁹

Conclusion:-

In conclusion, isolated coronoid fractures are extremely rare. The etiology of such fractures is due to trauma to the temporal region and the chin region when teeth are not into occlusion. The treatment plan should be based on the type of fracture pattern, presence of clinical symptoms, associated fractures and the timing of injury

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