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Case-report

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Mandibular coronoid dislocation: a rare case report

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Abstract

We report a rare case of a non-traumatic mandibular dislocation irreducible by closed maneuvers due to entrapment of the coronoid process above the zygomatic arch in an elderly patient successfully treated with coronoidectomy. An 86-year-old man presented with an open-lock jaw that could not be reduced manually. Computed tomography (CT) revealed anterolateral displacement of the mandibular condyle with impaction of the coronoid process, superolaterally dislocated, against the zygomatic arch. Under general anesthesia, a coronoidectomy was performed using a piezoelectric device through an intraoral approach, which allowed spontaneous reduction of the condyle. Immediate restoration of occlusion and mandibular function was achieved after surgery, and at three months of follow-up the patient showed a maximum mouth opening (MMO) of 40 millimeters, stable occlusion, and no evidence of recurrent dislocation. This case indicates that coronoidectomy can represent an effective and safe treatment option to relieve mechanical impingement in irreducible mandibular dislocations associated with coronoid process displacement, particularly in elderly patients.

Highlights

- Reports a rare, non-traumatic irreducible mandibular dislocation caused by isolated superolateral coronoid process entrapment above an intact zygomatic arch in an elderly patient.
- Demonstrates the key diagnostic role of CT imaging in identifying coronoid-zygomatic arch impingement as the mechanical cause of failed closed reduction maneuver in TMJ open-lock.
- Describes successful management using intraoral coronoidectomy, enabling spontaneous reduction without external surgical approaches.
- Highlights advanced age as a potential risk factor for atypical, atraumatic TMJ dislocation due to age-related anatomical and neuromuscular changes.
- Supports coronoidectomy as a safe, targeted, and low-morbidity surgical option for irreducible TMJ dislocations with confirmed coronoid interference, particularly in elderly patients.

1. Introduction

Dislocation of the mandibular condyle from the glenoid fossa is a recognized cause of acute malocclusion and mandibular open lock. Most temporomandibular joint (TMJ) dislocations are anterior or anteromedial and can generally be treated by closed reduction maneuvers, rarely requiring surgery. It commonly occurs due to excessive and prolonged mouth opening as a result of yawning, dental procedures or airway manipulation.

Atypical TMJ dislocations, including lateral or superolateral displacement of the mandibular condyle, are rare and typically associated with high-energy maxillofacial trauma [1]. In most cases reported in literature, this type of dislocation occurs in conjunction with mandibular fractures, often associated with concomitant fracture of the zygomatic arch. This alters the normal anatomical constraints of mandibular movement and predisposes the dislocation to be irreducible [2].

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The coronoid process plays an important but often underestimated role in atypical mandibular dislocations. When displaced anteriorly or superiorly, the coronoid process can strike against or above the zygomatic arch, creating a rigid mechanical obstacle that prevents condylar reduction and causes persistent open lock. Most cases of coronoid process displacement reported in literature are associated with fractures of the zygomaticomaxillary complex (ZMC), in which alteration of the zygomatic arch contour allows abnormal excursion of the coronoid process [3, 4].

Recent reports have highlighted the importance of CT in identifying coronoid-zygomatic interference as the primary cause of non-reducibility. Nini et al. described anterior dislocation of the coronoid process over a fractured zygomatic arch and emphasized the need for targeted surgical management in presence of a mechanical obstruction [3]. Similarly, some technical notes on atypical coronoid displacement in ZMC trauma have proposed diagnostic and therapeutic algorithms that include coronoidectomy as an effective method of relieving bone impingement and thus facilitating mandibular reduction [4].

Mandibular dislocation with coronoid process entrapment above an intact zygomatic arch, in the absence of facial fractures, is extremely rare [5]. To date, only isolated cases have been described, most of which involve traumatic mechanisms. The onset of this condition in elderly patients without trauma remains largely undocumented. The present case adds to the limited literature describing an irreducible mandibular dislocation caused by entrapment of the coronoid process above the zygomatic arch in an elderly patient, successfully treated by intraoral coronoidectomy.

2. Case report

2.1. Clinical Presentation

An 86-year-old male presented to the Emergency Room (ER) with sudden right open-lock, which occurred while shaving and lasted approximately 8 hours. The patient denied any history of facial trauma or systemic disease. He was referred to the Maxillofacial Surgery Department of the University of Udine to evaluate the possibility of manual reduction. On physical examination, the patient presented with persistent maximal mouth opening (MMO) > 40 mm, lateral deviation to the right, inability to occlude, and absence of condylar landmarks.

2.2. Diagnostic Assessment

A first immediate attempt of manual reduction in the ER was unsuccessful. A subsequent attempt under local anesthesia with Propofol sedation was likewise ineffective. A CT scan was then performed, revealing a right anterior mandibular condyle displacement with entrapment of the coronoid process above the zygomatic arch, resulting in a mechanical impingement without any associated fracture.

Figure 1. First clinical examination of the patient with an Open-Lock with mandibular deviation to the right side and inability to close the mouth.

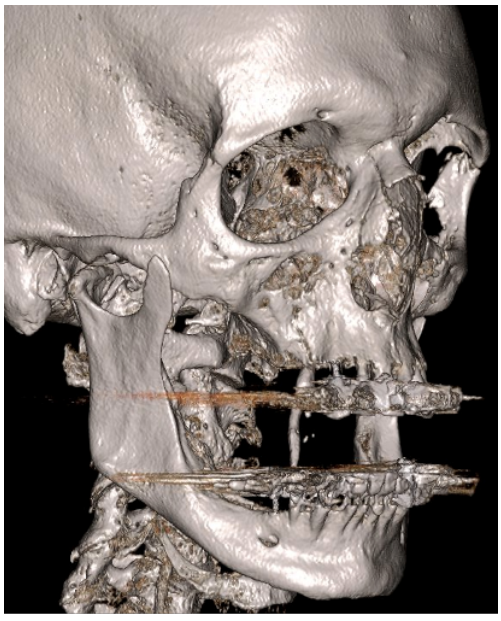

Figure 2. CT scan showing dislocation of the coronoid process supero-laterally to the zygomatic arch.

2.3. Surgery

A further attempt of manual reduction was undertaken after induction of general anesthesia with neuromuscular blockade; however, this maneuver was also unsuccessful. A coronoidectomy was subsequently performed via an intraoral approach in order to resolve the open lock, using a piezoelectric handpiece (Mectron, Carasco, Italy). Following removal of the coronoid process, the condyle spontaneously relocated itself into the glenoid fossa, resulting in stable occlusion and restoration of mandibular function.

2.4. Post-operative Course and Follow-Up

The patient was able to close his mouth immediately after surgery, and a Barton bandage was applied. Postoperative recovery was uneventful, and the patient was discharged on the following day. At the three-month follow-

up examination, MMO was 40 millimeters with normal lateral movements, absence of symptoms, stable occlusion, and no reported recurrence. A post-operative CT scan was performed, showing the result of the right coronoidectomy and the correct position of the right condyle.

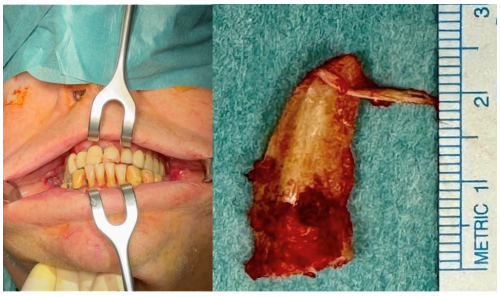

Figure 3. Stable occlusion after surgery; on the right the coronoid process excised.

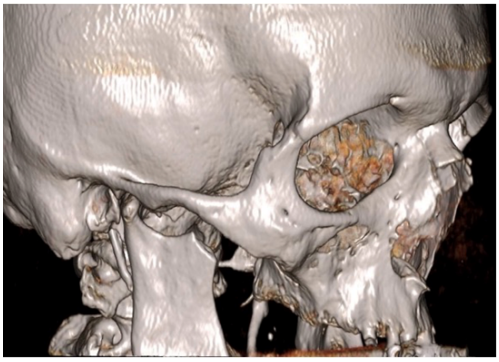

Figure 4. Post-operative CT scan showing correct reduction of the right condyle.

3. Discussion

Coronoid process displacement above the zygomatic arch is an exceptionally rare phenomenon. It is more commonly reported in young patients who have suffered high-energy facial trauma, typically associated with ZMC fractures [3, 4]. In these cases, the fracture or deformation of the zygomatic arch allows abnormal superior, lateral or anterior migration of the coronoid process, resulting in mechanical interference with mandibular movement. Failure to recognize this mechanism may result in repeated unsuccessful attempts at closed reduction and a consequent delay in definitive treatment.

This case differs substantially from the scenarios previously reported, as the dislocation occurred in an elderly patient in the absence of trauma, fractures, or iatrogenic factors. To our knowledge, non-traumatic entrapment of the coronoid process above an intact zygomatic arch causing irreducible mandibular dislocation has been described only in exceptional cases. Age-related anatomical and functional changes may predispose elderly individuals to atypical mandibular displacement patterns even during spontaneous or low-energy mandibular movements. Progressive ligamentous laxity of the temporomandibular joint capsule and associated supporting structures may reduce joint stability and allow excessive mandibular translation. Furthermore, decreased muscle tone and altered coordination of the masticatory muscles, particularly the temporal muscle, which inserts onto the coronoid process, can facilitate abnormal anterior or superior excursion of the coronoid during mouth opening. Similar considerations have been raised in reports on long-standing, spontaneous or non-traumatic TMJ dislocations in elderly patients, in which degenerative changes, reduced neuromuscular control and soft tissue laxity have been indicated as contributing factors rather than acute traumatic forces [6]. In this context, this case supports the concept that advanced age itself may represent a risk factor for atypical and mechanically non-reducible mandibular dislocations.

The mechanical nature of irreducibility observed in this case is consistent with previously described models of bony conflict, in which the coronoid process acts as a rigid lever preventing posterior and inferior repositioning of the mandible. In such circumstances, manual reduction of the condyle is unlikely to be successful regardless of the technique employed. CT is therefore essential not only to confirm the diagnosis, but also to identify the precise anatomical cause of the irreducibility and to guide surgical decision-making.

Various surgical strategies have been described for the management of irreducible or superolateral condylar dislocations, including open reduction via preauricular or submandibular approaches, sagittal split osteotomy, and, in chronic cases, condylectomy. However, these procedures may be associated with increased morbidity and are not always ideal in elderly or those with significant comorbidities. Reviews of long-standing TMJ dislocations demonstrated that intraoral surgical approaches, including coronoidectomy and condylectomy, can achieve satisfactory functional outcomes while minimizing surgical trauma and avoiding external scars [7–9].

More recently, coronoidectomy has been proposed as a targeted and effective solution when coronoid impingement is identified as the principal obstacle to reduction. Seok et al. reported successful management of superolateral condylar dislocations performing coronoidectomy, highlighting that release of the coronoid block allowed spontaneous repositioning of the condyle without the need for extensive external exposure [2]. Similarly, technical reports describing atypical coronoid displacement in a facial trauma setting have advocated coronoidectomy as a means of facilitating reduction while decreasing operative morbidity [4].

In the present case, intraoral coronoidectomy resulted in immediate restoration of occlusion and mandibular function, confirming that entrapment of the coronoid process was the primary cause of irreducibility. The favorable postoperative course and absence of recurrence

at follow-up further support coronoidectomy as a safe and effective treatment option in selected cases of irreducible TMJ dislocation. It is important to emphasize that advanced age alone should not be regarded as a contraindication to this approach when imaging clearly demonstrates coronoid-related mechanical impingement and the patient's comorbidities are appropriately managed.

4. Conclusion

Irreducible condylar dislocation of the mandibular condyle due to entrapment of the coronoid process over the zygomatic arch is an extremely rare condition, particularly in elderly, non-traumatic cases. CT is essential for accurate anatomical diagnosis and appropriate surgical planning. Coronoidectomy performed under general anesthesia can effectively resolve mechanical obstruction and facilitate anatomical reduction, resulting in favorable functional outcomes.

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