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Maxillofacial Surgery

Pathological Mandibular Fracture Associated with a Dentigerous Cyst: A Case Report

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Abstract | **Case Report**

We report the case of a 61-year-old man who was admitted to the emergency department with left-sided facial swelling following a punch. Clinical and radiological examinations revealed a mandibular fracture associated with a dental cyst. The patient underwent surgical management consisting of cyst enucleation, fracture reduction, and osteosynthesis. Histopathological analysis confirmed an inflammatory cyst. This case highlights the rare association between mandibular fractures and dental cysts, requiring specific surgical management.

Keywords: Mandibular fracture, Pathological fracture, Dentigerous cyst, Inflammatory cyst, Osteosynthesis, Maxillofacial surgery.

INTRODUCTION

Odontogenic developmental cysts are lesions that surround the crown of impacted, unerupted, or developing teeth. Dentigerous cysts represent the second most common cystic lesion of the oral cavity after radicular cysts.

The reported frequency is approximately 1.44% per 100 unerupted teeth in the general population, with a higher incidence during the second and third decades of life. Dentigerous cysts occur more frequently in males than in females and are most commonly associated with mandibular third molars, maxillary canines, and maxillary third molars [3].

Pathological fractures of the mandible are rare, accounting for less than 2% of all mandibular fractures. They are defined as fractures occurring in areas where the bone has been weakened by an underlying pathological process.

RESULTS

We report the case of a 61-year-old man with no significant past medical history who was admitted to the maxillofacial surgery emergency department at ARRAZI CHU MOHAMMED VI Hospital in MARRAKECH, MOROCCO, presenting with a slight, painful swelling in the lower left cheek area following a blow to the left side of his face one month prior to admission.

CLINICAL EXAMINATION

Oral examination: The patient presents with mild, slightly tender swelling in the lower left cheek area, with a palpable step-off at the mandibular basilar margin opposite the left horizontal ramus, and left labial-mentonhyoid hypoesthesia.

Oral examination: The patient is completely edentulous and presents with a slight, firm, erythematous swelling in the posterior region of the left mandible.

Radiographic examination included a panoramic dental X-ray, which revealed an oblique fracture line extending downward and backward, with displacement of the left horizontal ramus of the mandible passing through a cystic formation opposite the second and third molars on the same side. [Figure 1]

Un complément par une TDM faciale a été demandé qui a confirmé le diagnostic avec une soufflure de la corticale Osseuse en regard de la 2ème et 3ème molaire homolatérale. [Figure 2]

Le patient a bénéficié d'une énucléation du kyste avec extraction de la 2ème et 3ème molaire

mandibulaire gauche avec une réduction et ostéosynthèse de la fracture par une maxi plaque avec 6 vis de 11mm. [Figure 3]

A panoramic X-ray was taken on the first postoperative day. [Figure 4]

Pathology results: Morphological features consistent with a largely remolded inflammatory cyst of probable dentigerous origin, with no signs of specificity or malignancy

Figure 1: Panoramic X-ray showing a fracture of the left horizontal ramus of the mandible extending through a cystic lesion adjacent to the second and third molars on the same side

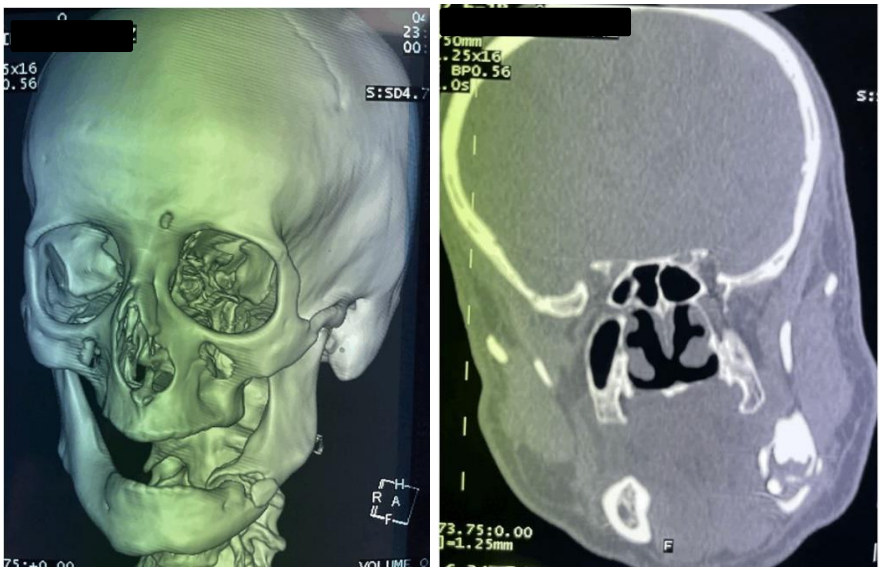

Figure 2: Facial CT scan with contrast enhancement showing a fracture of the left horizontal ramus of the mandible with a cortical bone defect adjacent to the second and third molars on the same side

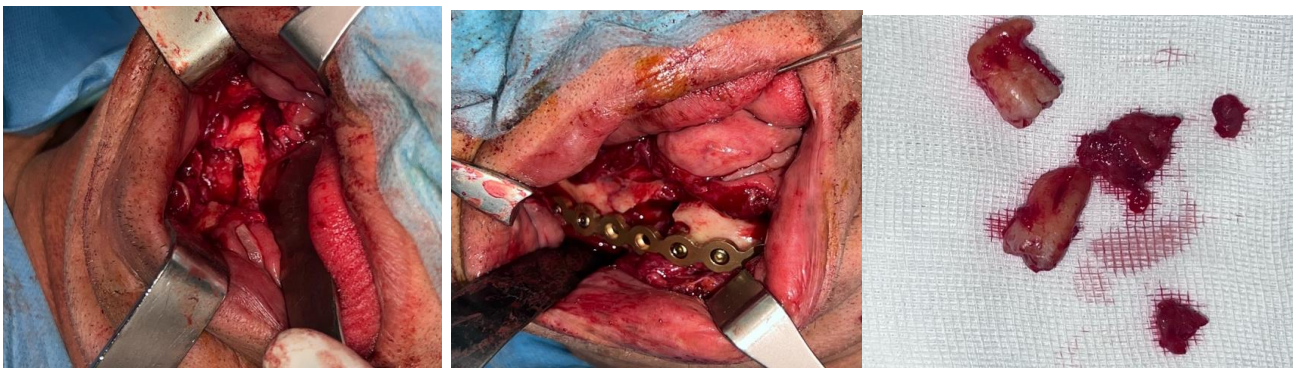

Figure 3:
A-Fracture of the left horizontal ramus
B-Fracture reduction and osteosynthesis using a maxillary plate
C-Excision of the dentigerous cyst

Figure 4: Postoperative panoramic X-ray

DISCUSSION

Mandibular fractures are the most common fractures of the facial skeleton, typically resulting from high-energy direct or indirect trauma. However, in certain cases, the characteristics of the fracture—such as the mechanism of injury, location, and clinical and radiological presentation—may suggest an underlying pathological condition.

The presence of bone pathology can significantly reduce tensile strength and facilitate fracture propagation, even following relatively minor trauma, along the path of least resistance. This type of fracture is commonly referred to as a *pathological fracture* [4].

Pathological fractures of the jaws may result from severe atrophy of edentulous alveolar ridges, osteoradionecrosis, osteomyelitis, bisphosphonate-related osteonecrosis, benign and malignant tumors, metastatic neoplasms, or cystic lesions [5].

Odontogenic cysts are developmental cysts of odontogenic origin and represent the most common type, accounting for approximately 14% to 24% of all jaw cysts [3] [1,2]. They are generally solitary, slow-growing, and asymptomatic lesions, often discovered incidentally on routine radiographic examinations performed to investigate a missing tooth. Although they can occur anywhere in the jaws, they are most frequently associated with impacted mandibular third molars, followed by maxillary canines and maxillary third molars [3] [7,8,10].

Pathological fractures associated with benign cystic lesions are very rarely reported, with only 10 cases described in a recent review of the literature. The mandibular angle and body are the most common sites for fractures associated with benign cysts [5].

Radiologically, dentigerous cysts present with characteristic features, appearing as well-defined radiolucent lesions with sclerotic borders, typically associated with the crown of an impacted or unerupted tooth [3] [8–9].

Pathological fractures are challenging to manage due to their diverse etiologies and their impact on normal bone healing. In most cases, open reduction and internal fixation are performed following cyst enucleation [4]. In cases of significant bone loss, resection of the affected bone may be required for reconstruction and stabilization.

Currently, several reconstructive options are available to maintain mandibular continuity, including the use of a locking reconstruction plate [LRP] alone, LRP combined with primary free bone grafting, delayed secondary bone grafting, or composite reconstruction [1] [15,18,33].

In our case, we opted for cyst enucleation combined with anatomical reduction under direct visualization via an external approach to adequately control the fracture site, followed by rigid fixation using a locking reconstruction plate [LRP]. Given that the patient was completely edentulous, the postoperative outcome was favorable.

CONCLUSION

Pathological fractures of the mandible associated with benign cystic lesions represent a clinical challenge due to their etiological diversity and their impact on the bone healing process. These fractures are often complex to manage, as treatment must address both resection of the cystic lesion and stabilization of the fracture. Therefore, the selection of the optimal therapeutic approach should be based on a thorough case-by-case evaluation, taking into account factors such as the extent of the lesion, the presence of comorbidities, and the patient's functional and aesthetic outcomes. Further studies are needed to refine treatment strategies and improve long-term outcomes in patients with mandibular pathological fractures associated with benign cysts.

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