Management of Dentigerous Cyst with Pathological Fracture of the Mandible

1Adil Gandevivala, 2Satyajit Dandagi, 3Amit Sangle, 4Aruna Tambuwala

ABSTRACT

A case of a 50-year-old male patient diagnosed with a pathological fracture of the angle of the mandible secondary to an undiagnosed dentigerous cyst associated with a mandibular third molar reported to our department. The patient was treated with enucleation of the cyst followed by reduction of the fracture and reconstruction with bone harvested from the anterior iliac crest. We have 1½ years follow without any signs of recurrence or major complications.

Key Words: Bone grafting, dentigerous cyst, iliac crest, pathological fracture.

Introduction

Dentigerous cyst (DC) is the second most common cyst of the jaw comprising 14-20% of all the jaw cysts.1 The present data showed that most DCs (77%) were located in the mandibular third molar region. Typical DC presents clinically as an asymptomatic unilocular radiolucency enclosing the crown of an unerupted or impacted tooth; the radiolucency usually arises in the cementoenamel junction of the tooth.2 In most cases, the cyst keeps expanding and is not diagnosed until symptoms such as bony expansion, facial disfigurement, and tooth migration present. In our case, the DC was diagnosed due to patients complain of the fractured mandible.

The exact definition of a pathological fracture is controversial. One suggestion is a fracture that “results from normal function or minimal trauma in a bone weakened by pathology.”3 Other authors have contended that it is impossible to define inadequate or minimal trauma, and that the definition should be “a fracture which occurs through a preexisting lesion or in a diseased part of the bone”4 and their incidence is <2% of all fractures.5

In oral and maxillofacial surgery, the anterior iliac crest is the most frequently used donor site for autogenous bone grafts that are used in reconstructive procedures such as sinus floor elevation, augmentation procedures, closure of alveolar clefts, and in post-traumatic or post-ablative reconstructive surgery. This site provides abundant corticocancellous bone and allows a two-team approach.6,7 In our case, bone harvested from the anterior iliac crest was used to reconstruct the bony defect after enucleation of the cyst and help in healing at the fracture site.

Case Report

A 50-year-old male patient reported to the Department of Oral and Maxillofacial Surgery with a chief complaint of pain and swelling in the lower back right region since 3 days (Figures 1-3). The patient was asymptomatic 3 days ago until he received trauma by blow to the right side of the face. Following which he developed a small swelling in the same region, which increased in size gradually. Examination revealed a diffuse swelling associated with a preexisting lesion or in a diseased part of the bone and their incidence is <2% of all fractures. A step could be palpated at the inferior border of the mandible. The swelling extended...
Pathological fracture of the mandible … Gandevivala A et al

from the angle of the mandible until the tragus of the ear and from the posterior border of the mandible until about 3 cm from the corner of the month. The swelling was tender on palpation and non-fluctuant. On intraoral examination, malocclusion was noted. On radiographic (orthopantomogram) examination, a fracture line was seen in the right side of the angle of the mandible posterior to the second molar. A surprise finding was a large radioluency in the body of the mandible extending from the fracture line in the angle of the mandible until the sigmoid notch; it was associated with an impacted tooth.

**Surgical procedure**
The patient was operated under general anesthesia. A modified submandibular incision through the first resting skin tension line was used; a subplatysmal plane of dissection was used to approach the site. The cyst was enucleated, and the impacted tooth was extracted. The fracture was reduced and fixed with a four hole with gap titanium plate with 8 mm screws. The anterior iliac crest was used as a source of harvesting bone. Corticocancellous particulate bone graft was placed in the cavity from where the cyst had been enucleated. Closure was done with 3-0 vicyr and 3-0 ethilon.

**Histopathologic examination**
The given hematoxylin and eosin stain section shows the cystic Lining Lumen lined by parakeratinized stratified odontogenic epithelium with 3-4 layers thick epithelial mesenchymal junction is flat. The surrounding connective tissue capsule is loosely to densely arranged composed of collagen fibers interspersed with spindle-shaped fibroblast small blood vessels and extravagated red blood cells are evident. Mild chronic inflammatory infiltrate in form of lymphocytes and plasma cells are seen. Features are suggestive of a DC.

**Discussion**
Most reports showed a peak incidence of DCs in the second and third decades of life, although some indicated the fifth decade. It has been demonstrated that males had a slightly higher incidence of DCs than females (1.6:1). Available data showed that most DCs (77%) were located in the mandibular third molar region. These cysts can be classified as central, lateral and circumferential. Pathological fractures within the facial region occur rarely. Pathological fractures of the mandible are rare, comprising <1% of 847 fractures in one series. The pre-dominant site was the posterior molar/angle region (65%), followed by body (22%) and symphysis (13%). Pathologic fractures are complex to treat because of their diverse etiologies and the impact these will have in relation to normal bone healing. Most of the pathological fractures reported in the literature was associated with osteoradionecrosis. Benign pathologies such as cysts have been marsupialized and treated with external fixation, enucleated with reconstruction plate and bone graft and enucleated then fixed with mini plates with and without bone grafts. In the present case, mini plates were used with a graft and obtained good healing of the fracture.

The most common donor site for autologous bone grafts for all disciplines is the iliac crest because of its ready accessibility, comparatively abundant bone volume, high bone quality, and

---

**Figure 1:** Pre-operative frontal view.

**Figure 2:** Pre-operative occlusion.

**Figure 3:** Pre-operative orthopantomogram.
low donor site morbidity. The anterior iliac crest bone graft is advantageous as it can provide up to 50 cc of corticocancellous graft of excellent quality. It allows for two surgical teams with simultaneous graft harvest and recipient site preparation. However, the use of autogenous bone grafts is always accompanied by the risk of transient donor site morbidity and possible surgical complications, and the number of available grafts is limited. For iliac crest harvesting, several complications have been described: Chronic pain, sensory loss, wound breakdown, contour defect, hernia through the donor site, instability of the sacroiliac joint, gait disturbance, pathologic fracture, a dynamic ileus, urethral injury, seroma, hematoma, and hemorrhage. In this particular case, we did not experience any long-term or major complication.

Conclusion

It is a rarity for a DC to enlarge to such an extent causing weakening of the mandible that led to pathological fracture of the mandible after receiving a minor blow to the face. After 1½ years of follow-up, we found no recurrence of the pathology; no donor site morbidity; good occlusion and excellent bone fill in the cavity showing a comprehensive management of the patient (Figures 4-6).

References