European Journal of Musculoskeletal Diseases
ISSN 2038-4106/2015

Case report

EXTERNAL AND INTERNAL RESORPTION ROOT BY A GIANT CYST: A CASE REPORT

A. Rosa[1], S. Casella[2] and A.M. Pujia[3]

[1]Materials for Health, Environment and Energy, Department of Chemical Sciences and Technologies, Dentistry, University of Tor Vergata, Rome
[2]Department of Clinical Sciences and Translational Medicine, University of Rome "Tor Vergata", Rome, Italy
[3]Department of Biomedicine and Prevention, University of Rome, Tor Vergata, Rome, Italy

Correspondence to:
Alberto Maria Pujia, DDS
Department of Biomedicine and Prevention, University of Rome "Tor Vergata",
Rome, Italy
e-mail: alberto@med.uniroma2.it

ABSTRACT

Root cysts are inflammatory odontogenic cysts related to the teeth. Most of these lesions involve the apex of the tooth and appear as well-defined radiolucency with clear margins without erosion of the neighbouring structures. Rhizolysis, defined as the process of resorption of the hard tissues of the dental element, appears to be physiological during tooth exfoliation, pathological in the permanent elements and is a possible consequence of many dental treatments. This case report documents a large root cyst associated with external root resorption. Based on the clinical, radiographic and histopathological findings, the present case was diagnosed as an infected root cyst. The lesion was surgically enucleated with the extraction of the associated tooth. Preservation of all other teeth and vital structures was achieved without postoperative complications and satisfactory healing.

KEYWORDS: *cyst, maxilla, jaw, bone, external radicular resorption*

INTRODUCTION

A radicular cyst is defined as a chronic inflammatory lesion of the periapical tissues of the tooth (alveolar bone and periodontal ligament) originating from infectious or degenerative pathologies of the internal tissues of the tooth (1). It is the most common form of cystic pathology of the jaw bones, most frequently affecting between thirty and fifty years of age.

The pathology usually remains asymptomatic for a long time and is typically diagnosable only by radiographic examination (2). In this phase, it is clinically and radiologically little distinguishable from the apical granuloma, from which it develops.

Received: 03 July 2015
Accepted: 07 September 2015

ISSN: 2038-4106

However, over time it can tend to increase in size, causing bone deformation, thus manifesting a symptomatology linked to the process of expansion and compression of the neighbouring structures (3, 4). The aim of this study was to describe the clinical management of a giant root cyst in the upper jaw.

Case Report

A 33-year-old male presented with localized swelling on the left upper jaw (Fig. 1). According to the patient, the swelling was insidious onset, gradually progressive, and fistulized. Element 1.1, already endodontically treated for 20 years, presented external root resorption and evident discolouration. External examination revealed widespread swelling on the left side of the jaw. The overlying skin was normal and painless, with no associated lymphadenopathy. Intraoral examination revealed an intact permanent dentition, swelling in the left upper alveolus associated with lateral incisors and mild palatal swelling. On palpation, the surface was smooth, with no noticeable fluctuations. It showed a faint bony crepitus in both the buccal and palatal sides.

An orthopantomogram (OPG) and computed tomography (CT) were acquired (Fig.2-4). Lateral and axial sections of the CT scan were analyzed. On the OPG, the lesion appeared to have a rounded radiolucency with well-defined margins. CT revealed an expansive, primarily cystic lesion of maximum dimensions of 13.5 mm x 12.8 mm x 11.6mm that had led to thinning and erosion of the bone along the cystic walls in the anterior maxillary areas. Laterally, the lesion was well circumscribed to the lateral and central incisors region. The central incisor had significant root resorption, and the cystic lining was in direct contact with the lateral incisor. The patient's biochemical tests revealed normal serum calcium levels, phosphorus and alkaline phosphatase.

Based on the clinical and radiological data, a preliminary diagnosis of a root cyst was made. The differential diagnosis included odontogenic cyst, maxillary mucocele, giant cell tumor, odontogenic adenomatoid tumor, and uni- cistic ameloblastoma.

Since the involved bone had multiple cortical erosion involving the vestibular and palatal walls and the resorption of the associated tooth, enucleation of the lesion was planned with tooth extraction (Fig. 5, 6). After raising the flap, under local anaesthesia, the margins of the cyst were visualized and marked. The lesion was removed from the anterior maxillary wall. The defect was closed with a bone graft collected by the same patient (Fig.7, 8). The area was debrided entirely from the obtained hemostasis and closed in layers with resorbable sutures (Fig. 9, 10).

Appropriate antibiotics (Amoxicillin 875 mg + Clavulanic acid 125 mg), pain relievers (Naproxen 550 mg tablet) and dietary instructions were provided. The lesion healed well during the postoperative period, and the patient had no recurrence at the 3-year follow-up.

Fig. 1. *Frontal view of the oral cavity.*

Fig. 2. *Orthopatomography.*

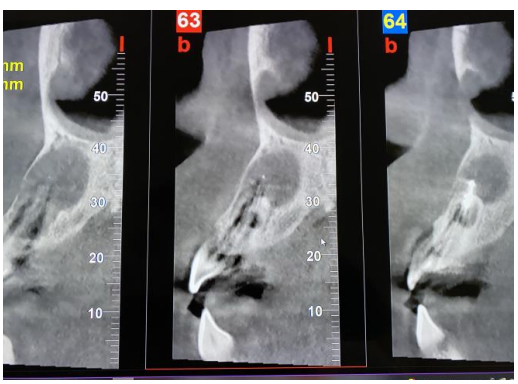

Fig. 3. *Lateral view of CT scan.*

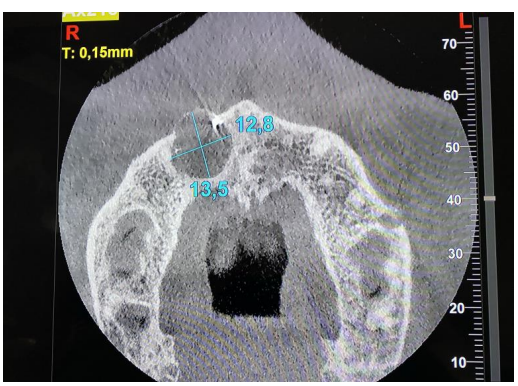

Fig. 4. *Axial view of CT scan.*

Fig. 5. *Surgical exposures of external maxillary wall.*

Fig. 6. *Alveolus after tooth extraction.*

Fig. 7. *Bone empty space after cyst removal.*

Fig. 8. *Grafted bone.*

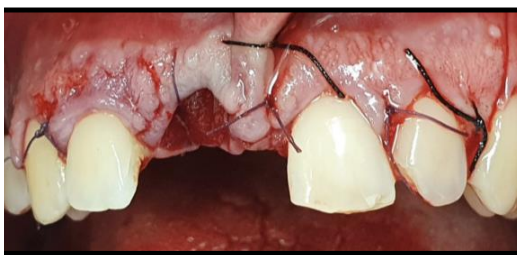

Fig. 9. *Sutures.*

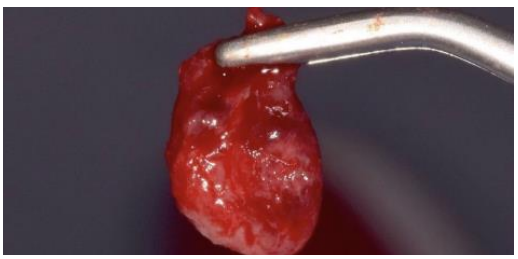

Fig 10. *Cyst.*

DISCUSSION

The most common cause for root cyst formation is infectious (5-11). Infections derived from bacteria, toxins and products of metabolism can reach the periapical tissues (periodontal ligament and alveolar bone) through the internal canals of the tooth (12-13). Sometimes the pathology develops from a tooth previously treated for a pulp pathology (devitalization). In these situations, the case is still bacterial due to the permanence of untreated canal areas (subsequently to lack of instrumentation or canal toot aberrant geometry).

One of the most common complications is empyema or infection of the cystic cavity. In this case is an acute infection with pain, swelling and body temperature increase (14, 15). In addition, fistulization can occur in the oral cavity or, more rarely, in the facial skin.

A root cyst is unlikely to cause significant erosion of the tooth or roots, even in very large lesions. However, if tooth erosion appears radiographically, the coexistence of internal resorptions must be suspected (16).

In large cysts, massive growth can lead to compression of local nervous structures, with the consequent appearance of paresthesia and deformation of the bone and facial structures, due to its progressive enlargement (17, 18).

Sometimes the cystic lesion can reach dimensions able to cause fracture of the affected bone for simple, functional stresses such as chewing. In addition, the development of ameloblastoma and squamous cell carcinoma from a root cyst has been reported. However, given the rarity of these reports, the probability is very low (19).

In order to remove the cyst, it is necessary to proceed with the surgical enucleation of the entire lesion (cystectomy or Partsch II intervention). Instead, when the cystectomy is not recommended due to the risk of damaging important structures such as vessels and nerves, a marsupialization (cystotomy or Partsch I intervention) is the best choice. The first type of intervention (cystectomy) aims to remove the cystic tissue altogether. The advantage of this procedure is the possibility of histological diagnosis of the entire lesion and the filling of the residual cavity with bone to reduce the recovery time (20, 21).

REFERENCES

1. Shear M, Speight P. *Cysts of the Oral and Maxillofacial Regions*. John Wiley & Sons; 2008.
2. Johnson NR, Gannon OM, Savage NW, Batstone MD. Frequency of odontogenic cysts and tumors: a systematic review. *Journal of Investigative and Clinical Dentistry*. 2013;5(1):9-14. doi:https://doi.org/10.1111/jicd.12044
3. Bernardi L, Visioli F, Nör C, Rados PV. Radicular Cyst: An Update of the Biological Factors Related to Lining Epithelium. *Journal of Endodontics*. 2015;41(12):1951-1961. doi:https://doi.org/10.1016/j.joen.2015.08.036
4. Joshi N, Sujan SG, MM Rachappa. An unusual case report of bilateral mandibular radicular cysts. *Contemp Clin Dent* . 2011;2(1):59-59. doi:https://doi.org/10.4103/0976-237x.79295
5. White SC, Sapp JP, Seto BG, Mankovich NJ. Absence of radiometric differentiation between periapical cysts and granulomas. *Oral Surgery, Oral Medicine, Oral Pathology*. 1994;78(5):650-654. doi:https://doi.org/10.1016/0030-4220(94)90180-5
6. Gibson GM, Pandolfi PJ, Luzader JO. Case report: a large radicular cyst involving the entire maxillary sinus. *General Dentistry*. 2002;50(1):80-81.
7. Estrela C, Bueno MR, Azevedo BC, Azevedo JR, Pécora JD. A New Periapical Index Based on Cone Beam Computed Tomography. Journal of Endodontics. 2008;34(11):1325-1331. doi:https://doi.org/10.1016/j.joen.2008.08.013
8. Araujo R.Z. , Vazquez Gomez R.S. , Castro W, Lehman LL. Pathology Differential diagnosis of antral pseudocyst, surgical ciliated cyst, and mucocele of the maxillary sinus. Ann Oral Maxillofac Surg . 2014;(2):10-16.
9. Zhang R, Wang H, Tian YY ., Yu X, Hu T, Dummer PMH. Use of cone-beam computed tomography to evaluate root and canal morphology of mandibular molars in Chinese individuals. International Endodontic Journal. 2011;44(11):990-999. doi:https://doi.org/10.1111/j.1365-2591.2011.01904.x
10. Taschieri S, Del Fabbro M, Testori T, Weinstein R. Efficacy of Xenogeneic Bone Grafting With Guided Tissue Regeneration in the Management of Bone Defects After Surgical Endodontics. Journal of Oral and Maxillofacial Surgery. 2007;65(6):1121-1127. doi:https://doi.org/10.1016/j.joms.2006.10.022
11. Ricucci D, Mannocci F, Pitt Ford TR. A study of periapical lesions correlating the presence of a radiopaque lamina with histological findings. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 2006;101(3):389-394. doi:https://doi.org/10.1016/j.tripleo.2005.08.026
12. Lin SK, Wang JT, Wu PH, et al. Apical periodontal cyst: a clinicopathologic study of 405 cases. China Journal of Oral and Maxillofacial Surgery. 1993;4(4):106-119.
13. Torres-Lagares D, Segura-Egea JJ, Rodríguez-Caballero A, Llamas-Carreras JM, Gutiérrez-Pérez JL. Treatment of a large maxillary cyst with marsupialization, decompression, surgical endodontic therapy and enucleation. Journal (Canadian Dental Association). 2011;77:b87.
14. Koseoglu BG, Atalay B, Erdem MA. Odontogenic cysts: a clinical study of 90 cases. Journal of Oral Science. 2004;46(4):253-
15. 257. doi:https://doi.org/10.2334/josnusd.46.253
16. Vesna Koželj, Sotošek B. Inflammatory dentigerous cysts of children treated by tooth extraction and decompression—report of four cases. Br Dent J . 1999;187(11):587-590. doi:https://doi.org/10.1038/sj.bdj.4800339a
17. Motamedi MHK, Talesh KT. Management of extensive dentigerous cysts. British Dental Journal. 2005;198(4):203-206. doi:https://doi.org/10.1038/sj.bdj.4812082
18. Pradel W, Eckelt U, Lauer G. Bone regeneration after enucleation of mandibular cysts: Comparing autogenous grafts from

tissue- engineered bone and iliac bone. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 2006;101(3):285-290. doi:https://doi.org/10.1016/j.tripleo.2005.06.001

19. Ettl T, Gosau M, Sader R, Reichert TE. Jaw cysts – Filling or no filling after enucleation? A review. Journal of Cranio- Maxillofacial Surgery. 2012;40(6):485-493. doi:https://doi.org/10.1016/j.jcms.2011.07.023
20. Schramm A, Rücker M, Sakkas N, Ralf Schön, Düker J, Nils-Claudius Gellrich. The use of cone beam CT in cranio-maxillofacial surgery. International Congress Series. 2005;1281:1200-1204. doi:https://doi.org/10.1016/j.ics.2005.03.224
21. Chiapasco M, Rossi A, Jones Motta J, Crescentini M. Spontaneous bone regeneration after enucleation of large mandibular cysts: A radiographic computed analysis of 27 consecutive cases. Journal of Oral and Maxillofacial Surgery. 2000;58(9):942-948. doi:https://doi.org/10.1053/joms.2000.8732