

Piezoelectric Assisted Management of Mandibular Cemento-Ossifying Fibroma: A Case Report

Dhekra Jlassi^{1*}, Nour Saida Ben Messaoud^{1,2}, Ghada Bouslama^{1,2}, Aya Mtiri¹, Souha Ben Youssef^{1,2} and Abdellatif Boughzela^{1,2}

¹Oral Surgery Unit, Dental Medicine Department in University Hospital Farhat Hached, Sousse, Tunisia

²Research Laboratory: LR 12SP10: Functional and Aesthetic Rehabilitation of Maxillary, Tunisia

***Corresponding Author:** Dhekra Jlassi, Oral Surgery Unit, Dental Medicine Department in University Hospital Farhat Hached, Sousse, Tunisia.

Received: March 15, 2021; **Published:** August 30, 2021

Abstract

Cemento-ossifying fibroma is a rare odontogenic benign tumor with female predilection between the third and fourth decades of life. In 62 - 89% of cases, the mandible is affected with a marked percentage involving premolar-molar region. A definitive diagnosis is usually established based on the correlation between clinical, radiological, and histological findings. Surgical enucleation and curettage are always required. Piezo surgery may be considered effective in COF enucleation compared to conventional procedures, since it prevents tissue damage and grants less post-surgical pain and swelling.

The purpose of this paper was to present an alternative approach in the atraumatic management of cementoosseous mandibular fibroma using piezoelectric-assisted surgery.

Keywords: *Cemento-Ossifying Fibroma; Piezoelectric-Assisted Surgery*

Introduction

Cemento ossifying fibroma is considered as the most common benign fibro osseous lesion that involves exclusively the maxillofacial jaws [1]. COF diagnosis criteria and terminology have been always unclear and controversial topic [2]. In the recent 2017 World Health Organization (WHO) head and neck tumors classification published in 2017, the term "cemento ossifying fibroma (COF)" was added [3]. It typically affects females in the third and fourth decades of age [4]. Nearly 62 to 89% of cases, the mandible is affected with a marked percentage involving premolar-molar region [5]. Evolution is slow and progressive [1]. While one-half of all cases being asymptomatic, the mass growth may cause discomfort or mandibular expansion, and the possible root displacement. displacement of and facial deformity [4]. The definitive diagnosis requires integration of clinical, radiological and histological features.

The purpose of this paper was to present an alternative approach in the surgical management of Cement ossifying fibroma using piezoelectric-assisted surgery.

Case Observation

A 35-year-old woman with no relevant medical history, was referred to our department for evaluation of left lower buccal vestibule swelling associated to pain and difficulty during speech and swallowing; No pain was reported in the swelling area. The mass had been increasing in size in the last 6 months according to the patient. The patient’s extraoral examinations were noncontributory.

intra-oral examination revealed a dome shaped swelling that measured approximately 3 cm at the right buccal vestibule regarding the teeth 35,36 with normal overlying mucosa. On palpation the mass was lobulated, bony hard in consistency with well-defined borders. The molar 36 involved was tender to pressure and percussion, the vitality of 36 and 35 was retained (Figure 1).



Figure 1: Vestibular swelling regarding the 36 with normal appearing overlying mucosa.

Various cone-beam CT (CBCT) scan sections were carried out: Axial section showed a high density sclerotic mass surrounded by hypodense borders in the right side of mandibula measuring 2 × 2 cm which caused thinning and bulging of the anterior vestibular cortical (Figure 2).

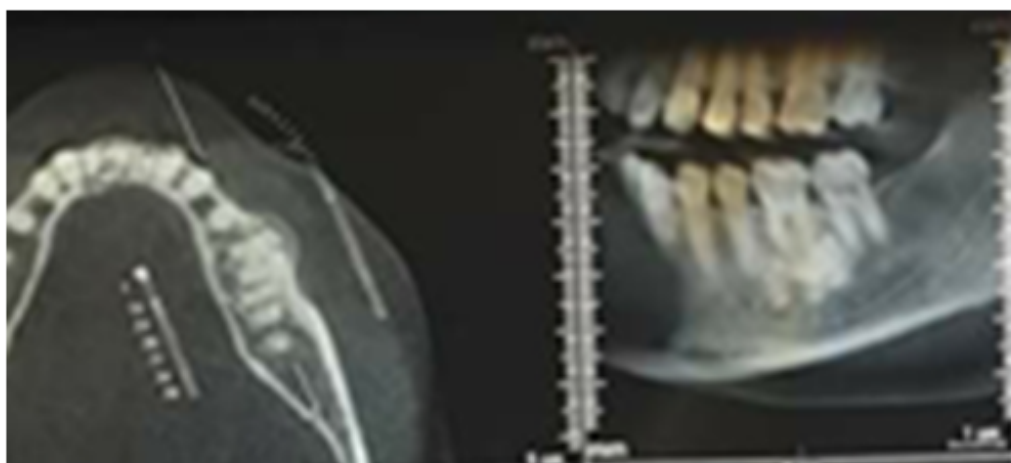


Figure 2: Axial section showed a high density sclerotic mass surrounded by hypodense borders which caused expansion of the vestibular cortical.

Oblique coronal section showed a well-defined radiopaque image, the internal structure of the mas was mainly a scattered radiopacity with similar density to the surrounding bone. The surrounding structures appeared normal (Figure 3).



Figure 3: Oblique coronal section showed a well differentiated image, the internal structure was mainly a scattered radiopacity with a similar density to the surrounding bone.

Based on medical history; clinical and radiographic findings a first pre-operative diagnosis of mandibular COF was retained. The differential diagnosis included ossifying fibroma, fibrous dysplasia and central giant cell granuloma.

Complete surgical removal of the lesion was carried out under local anesthesia and sent for histopathologic analysis.

Surgical steps consisted of:

- Elevation of full-thickness mucoperiosteal flap to gain access to the lesion.
- The mass was well-encapsulated with a cleavage plane allowing it to be shelled out from its surrounding structures (Figure 4).
- surgical enucleation using piezoelectric inserts with integrated saline irrigation to control temperature of the surgical site and avoid the use of excessive force and preserve the cervical alveolar bone (Figure 5).
- The granulomatous tissues and calcifications were removed by curettage, and an abundant rinsing of the cavity was carried out with physiological serum.
- The molar associated with the lesion was extracted (Figure 6).
- the bony margins were thoroughly freshened to remove all fragments which were firmly attached to the underlying bone structure (Figure 7).
- Primary closure was achieved by simple sutures (Figure 8).

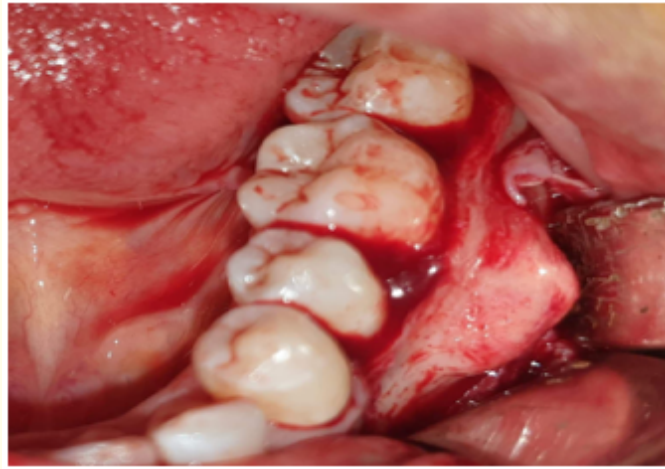


Figure 4: Mucoperiosteal flap removal: the mass was well-encapsulated with a cleavage plane.



Figure 5: Bone curettage using piezo inserts.

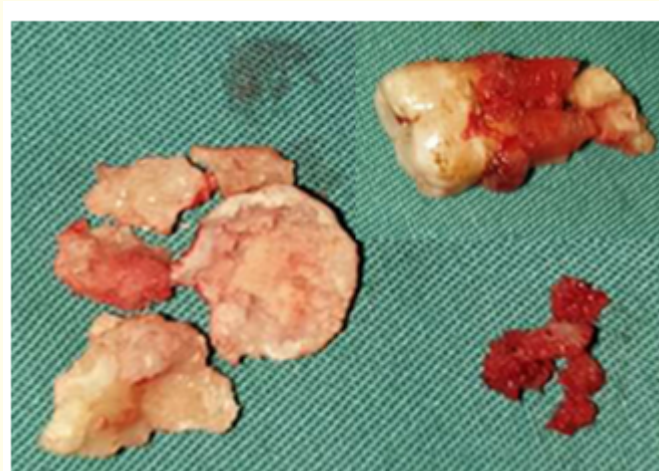


Figure 6: Surgical piece, the molar associated with the lesion was extracted.



Figure 7: Surgical site after removal of the entire lesion.



Figure 8: Flap repositioning and sutures.

Antibiotics, analgesics, and steroidal anti-inflammatory drugs were prescribed and the patient was recalled after 1 week for a follow-up.

The histological examination revealed regular hypercellular fibrous conjunctive tissue. tissue stroma, mineralized areas in the center appeared to be composed of cementum-like hard tissue calcifications and irregularly shaped bone. No cellular atypia or atypical mitotic activity was noted.

The definitive diagnosis was COF. The healing period was uneventful and ten days later the sutures were removed.

Discussion

COF is a well-demarcated and encapsulated benign tumor that contains fibrous tissue and varying amounts of calcified bone tissue, cementum, or both [2,6], which range from the periodontal membrane that has multipotent cells capable of forming cementum, lamellar bone, and fibrous tissue [2,6,7].

While the exact pathogenesis remains unknown, it may be congenital, related to dental tissue development perturbation, which is able to form cement and bone tissue [1]. Also, trauma such as dental extractions could leave part of the periodontal tissue attached to the wall of the alveolus, predisposing to stimulation and subsequent deposition of cementum [1,2,5]. It may not be the possible triggering factor to develop the disease process, thus the cause is considered to be idiopathies [4].

A definitive diagnosis is usually established based on the correlation between clinical, radiological, and histological findings [7].

Clinically, COF present as a well delineated and slowly growing mass in the jaw, covered with normal mucosa with no general signs or associated adenopathies, teeth adjacent to the lesion remain vital, vitality test may help in differentiating the COF from condensing osteitis [1,7]. Over time the lesion may become large enough to cause teeth displacement, facial deformation also paresthesia or pain can be present, especially during infection [5,8]. A more aggressive form may occur in childhood as juvenile aggressive COF, which is clinically more aggressive and more vascular at the pathological examination [2,9].

COF can be identified accidentally in radiographs [10]. In its early stages, it presents as a lucent area. As the lesion matures, they vary in radiopacity depending on the amount of cementum and bone that have been deposited, it is radiolucent in 53%, sclerotic in 7% and mixed density in 40% [7,9,11]. The margin of the lesion is relatively well defined and surrounded by a halo of less ossified tissue [7].

The typical diagnostic characteristic in COF is the centrifugal growth pattern which expand equally in all directions and produce a round tumor mass with easily distinguishable borders from the surrounding bone [10,12]. Radiographs plays a pivotal role in differentiating COF from other FO lesions [12].

Differential diagnosis of COF includes fibrous dysplasia, cement-osseous dysplasia, condensing osteitis, pindborgs tumor, and odontoma [12,13]. Fibrous dysplasia is the main differential diagnosis, it tends to grow longitudinally with ill-defined margins margin, linear expansion of the cortex and a ground glass attenuation, in contrast to COF appearance which is concentric within the medullary zone and the cortical layers are preserved [8]. The CBCT scan in our cases showed expanded buccal cortical with concentric appearance concluding the diagnosis of COF.

A close relationship exists between the central COF and the central ossifying fibroma. the only difference is that in the latter there is cementoid formations with immature bony trabeculae [14]. Since histologic characteristic may not observed in every portion of the tumor, several sections of the specimen should be carefully examined [8].

Surgical excision of COF must be complete, as the lesion progressively increased in size, which represents a threat to the adjacent dental roots. The treatment of COF varies according to the size of the lesion from surgical curettage or enucleation to radical surgery and long-term observation [13,14]. As typified in our patient the cemento-ossifying fibroma appears to be well demarcated, easily split off from the surrounding healthy bone [13] making it accessible to enucleation followed by curettage of the residual cavity [1,12]. The prognosis is known to be good and recurrence is not frequent, thus conservative surgery is recommended even if the tumor is large [8,12,14].

Conventional tools, such as rotating burs and oscillating saws, have been widely used in dental surgery and highly effective in cutting bone tissue. However, they could be dangerous when used in proximity to soft tissues especially nerves and blood vessels [15]. In this

context and to keep abreast of technological advances in the medicine field, an amenable enucleation approach using piezoelectric technique was carried out in our case.

Piezo surgery may be an alternative in dental surgery procedures such as odontogenic tumor enucleation [16]. The instrument's tip vibrates at modulated ultrasonic frequency, a "selective cut" that could remove bony mass of the mandible and prevent damage to soft tissue and nerve injury [17]. Damage of soft tissue is likely to occur at frequencies of 50 kHz or more, with this new option the frequency of the oscillations applied in osteotomies lies between 22 and 29 kHz [18]. Other than selective cut, piezo surgery has innovative therapeutic characteristics such as: a cavitation effect created by its oscillating tip that drives the cooling-irrigation fluid, making it possible to obtain effective cooling as well as clear surgical site, less vibration and noise that improved patient comfort [17,19]. Overall, compared to conventional surgical instruments, patients treated with piezoelectric technique present less postoperative pain, minor swelling and less recovery time [16,20].

Conclusion

The diagnosis of cemento-ossifying fibroma is oriented by the clinical, radiological features and confirmed on histopathological examination.

Surgical enucleation and curettage are always required as tumor expanding slowly and progressively. Piezo surgery may be considered effective in COF enucleation compared to conventional procedures with burs, since it prevents tissue damage and grants less post-surgical pain and swelling.

Bibliography

1. Trijolet JP, et al. "Cemento-ossifying fibroma of the mandible". *European Annals of Otorhinolaryngology, Head and Neck Diseases* 128.1 (2011): 30-33.
2. Bala TK., et al. "Cemento-ossifying fibroma of the mandible. A clinicopathological report". *Saudi Medical Journal* 38.5 (2017): 541-545.
3. SK El-Mofty. "Fibro-osseous lesions of the craniofacial skeleton: an update". *Head and Neck Pathology* 8.4 (2014): 432-444.
4. Mahato B., et al. "Central cemento-ossifying fibroma: a case report". *MOJ Clinical and Medical Case Reports* 3.2 (2015): 214-216.
5. Peravali RK., et al. "Maxillo-Mandibular Cemento-ossifying Fibroma: A Rare Case Report". *Journal of Oral and Maxillofacial Surgery* 14.1 (2015): 300-307.
6. Mohapatra M., et al. "Cemento-ossifying fibroma of mandible: An unusual case report and review of literature". *Journal of Oral and Maxillofacial Pathology* 19 (2015): 405.
7. Mithra R., et al. "Imaging in the Diagnosis of Cemento-Ossifying Fibroma: A Case Series". *The Journal of Clinical Imaging Science* 2 (2012): 52.
8. Ilvestre-Rangil J., et al. "Cemento-ossifying fibroma of the mandible: Presentation of a case and review of the literature". *Journal of Clinical and Experimental Dentistry* 3.1 (2011): e66-69.
9. Dewan HS., et al. "Cemento-ossifying fibroma of mandible mimicking complex composite odontoma". *BMJ Case Reports* (2016): bcr2016216053.
10. Y Sirin., et al. "Maxillary cementoossifying fibroma in a male patient with end-stage chronic renal disease". *International Journal of Clinical Dental Science* 2.3 (2011): 33-37.

11. Hombal AG., *et al.* "Cemento-ossifying fibroma of mandible". *Australasian Radiology* 51 (2007): B176-179.
12. Yaga US., *et al.* "Central cemento-ossifying fibroma of posterior maxilla". *Journal of Indian Academy of Oral Medicine and Radiology* 27 (2015): 282-285.
13. Katti G., *et al.* BMJ Case Reports Published online.
14. Naik RM., *et al.* "Giant cemento-ossifying fibroma of the mandible". *Journal of Natural Science, Biology and Medicine* 5.1 (2014): 190-194.
15. Adel Bouguezzi., *et al.* "Piezoelectric-Assisted Removal of a Mandibular Cementoossifying Fibroma: An Innovative Technique". *Case Reports in Dentistry* (2020): 5.
16. Pappalardo S and Guarnieri R. "Randomized clinical study comparing piezosurgery and conventional rotatory surgery in mandibular cyst enucleation". *Journal of Cranio-Maxillofacial Surgery* 42.5 (2014): e80-85.
17. Schlee M., *et al.* "Piezosurgery: basics and possibilities". *Dental Implant* 15.4 (2006): 334-340.
18. Wagner ME., *et al.* "Piezoelectric-assisted removal of a benign fibrous histiocytoma of the mandible: an innovative technique for prevention of dentoalveolar nerve injury". *Head and Face Medicine* 7 (2011): 20.
19. Pavlíková G., *et al.* "Piezosurgery in oral and maxillofacial surgery". *International Journal of Oral and Maxillofacial Surgery* 40.5 (2011): 451-457.
20. Pereira CC., *et al.* "Piezosurgery applied to implant dentistry: clinical and biological aspects". *The Journal of Oral Implantology* 40 (2014): 401-408.

Volume 20 Issue 9 September 2021

©All rights reserved by Dhekra Jlassi., *et al.*