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Case Report

Jaw osteomyelitis of Garre's – A rare case report with literature review

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ABSTRACT

A particular kind of chronic osteomyelitis called Garre's osteomyelitis causes new bone to grow beneath the periosteum. The genesis of this condition affecting the mandible is linked to mild oral infections or irritations. This case report details a 15-year-old kid who had additional oral oedema in his lower jaw due to proliferative periostitis. A CBCT scan revealed laminated expression of anew designed periosteal bone alongside the buccal cortex and lower edge of the jaw. The patient had antimicrobial medication along with endodontic management for 37.

1. Introduction

Even with the advent of antibiotics and advancements in dentistry and medical care, osteomyelitis of the jaws remains a fairly prevalent condition in maxillofacial clinics and offices.[1] The yearly incidence of chronic type, Garre's sclerosing osteomyelitis (GSO), a form of chronic osteomyelitis that largely disturbs adolescents and teenagers, is roughly 13 per 100,000 people.[2] It is also identified as 'chronic non-suppurative sclerosing osteomyelitis, chronic osteomyelitis with proliferative periostitis and periostitis ossificans'.[3] Men under 30 are more likely to have Garre's osteomyelitis (GO), which frequently affects one side of the mandibular trunk.[4] The mandible, specifically the premolar and molar regions, is the most commonly affected area in the oral and maxillo-facial region.[5] Infections of squat virulence, such as tooth decay, mild periodontitis, dental eruption, or prior tooth extraction in the lesion area, are typically the cause when it affects the jaw.[6]

Carl Garre is the person who gave the name GO. In 1893, he was the first to characterise it as 'a crucial gross solidifying of periosteum with peripheral reactive bone formation ensuing from infection.'[7] Berger reported the first occurrences involving the jaw in 1948, and Pell detailed them in 1955.[8] It typically results from an infection with low virulence, and its hallmark is persistent non-suppurative proliferative osteomyelitis linked to the development of new bone.[9]

Due to the lesion's unilateral expansion to the bone's outer surface, GO clinically causes facial asymmetry. Although severe pain can happen if the lesion becomes secondary infected, discomfort is not a characteristic finding.[10]

A distinctive radiographic aspect of GO is the presence of fresh periosteal proliferation, which is shown in consecutive layers to the condensed cortical bone on occlusal radiographs.[4] This characteristic, commonly referred to as

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"onion skin" appearance, is typical radiographic evidence of GO. Removal of the hyperostotic area brought on by the periosteal reaction and extraction of the causative tooth is the recommended course of treatment, with generally positive results.[11]

This article details a unique case of PO that developed in a 14-year-old boy's mandible.

2. Case Report

A 14-year-old boy reported to a private dental clinic with the complaint of pain in the left lower back tooth region and extra-oral swelling in the left lower third of face. Extra-oral examination of left side revealed a diffuse non-tender swelling that was firm in consistency with no lymphadenopathy and the skin color was normal. Intra-oral examination disclosed deep carious lesion in relation to 37 with occlusal caries irt 36. No mobility or tenderness was evident in relation to 36, 37. On palpation, it was rigid in constancy with no tenderness. There was a mild expansion of the lingual and buccal cortex in the region of 36, 37 region. A provisional diagnosis of chronic alveolar abscess was made in relation to 37 with Reversible pulpitis irt 36 was made. Intra-oral periapical radiographs of involved teeth revealed occlusal caries irt 36 with deep disto occlusal caries involving enamel & dentine close to pulp. Cone Beam Computed Tomography (CBCT) cross sectional images irt 37 showed disto-proximal caries extending upto dentin wrt 37 (Figure 1). Axial, sagittal section and 3- dimensional reconstructed images showed perforation of buccal cortical plate seen in middle and apical third level of 33 region. Irregular small area of hyperdensity with surrounding hypodense area noted in 33, 34 region suggestive of sequestrum with perforation of labial cortical bone (Figures 2 and 3). Diffuse periosteal bone reaction noted wrt both cortical plates in middle and lower third of alveolar bone and lower border of mandible extending from 32-36 forming an interspersed areas of laminated type of bone formation. Axial 7 Cross sections displayed tunnel like radiolucent defect noted to be extending from periapical region of 33, 34 upto the buccal cortex around which radiopaque bone formation noted with 'onion skin' appearance representing the peripheral sub-periosteal bone deposition suggesting the diagnosis of GO (Figures 4 and 5). Endodontic management of 37 with restoration irt 36 and antibiotic therapy was given to the patient. As the patient was then lost to follow-up, the final result of treatment is not known for the case.

3. Discussion

A kind of persistent osteomyelitis called PO is also referred to as GO.[26] In the dental literature, it is a well-researched pathologic condition. Deep carious lesion and peirapical pathology are commonly linked to the disease since most

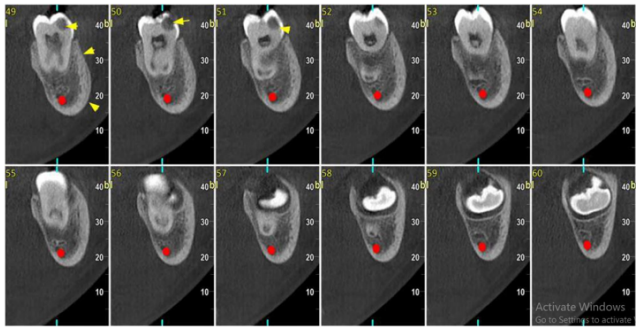

Figure 1: CBCT– Cross sectional images showing disto proximal caries irt 37

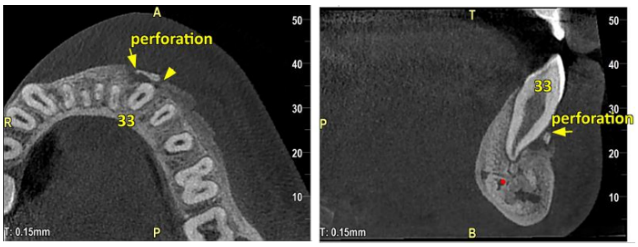

Figure 2: CBCT - Axial image & cross sectionirt 33, 34 region showing labial cortical perforation

Figure 3: CBCT - 3-dimensional image showing perforation of labial cortex

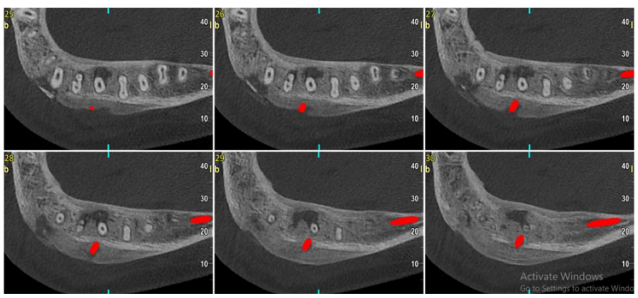

Figure 4: CBCT– Axial sections showing displayed tunnel like radiolucent defect on buccal cortex with onion appearance

Table 1: Classification of periostitis ossificans based on the radiographic appearance

	Type 1 (basic mandibular outlines maintained)	**Type II** (basic mandibular outlines are mislaid)
Subtype 1	A single lamella is observed as a radiolucent line separating a radiopaque line of periosteal new bone that covers the original cortex.	Osteolytic regions and newly created bone expansion are typically seen. The old cortex is resorbing.
Subtype 2	Evident hemi-elliptical newly created bony growth, clearly defined, with a thin cortical surface on the exterior of the original cortex, giving the impression of onion skin.	Deformation with a uniformly dense osteosclerotic bone that allowed for the identification of the original cortex. On occasion, this subtype displayed duplication of recently created periosteal bone on the exterior of the malformed jaw.

Table 2: Reported cases in literature.

Name	**Year**	**Age/ Gender**	**No of cases**	**Region**
Schwartz S et al [12]	1981	10 year/female	1	Left mandibular first molar
Gonçalves M et al [13]	2002	10 year/male	1	Left mandibular first molar
Kannan SK et al [6]	2006	11 year/ male	2	Right mandibular first molar Left mandibular premolar molar
Suma R et al [14]	2007	10 year/ male	1	Right mandibular molar
Shah KM et al [15]	2013	5 year/ -	1	Right mandibular second molar
Berglund C et al [16]	2015	10 year/female 11 year/female	2	Left mandibular body & ramus Right mandibular body & ramus
Gumber P et al	2016	7 year/ male	1	Left mandibular first molar
Akgul HM et al	2018	8 year/female 16 year/female	2	Right mandibular region Left mandibular premolar
Aeran H et al [17]	2018	10 year/male	1	Right mandibular first molar
Malanchuk V et al [18]	2018	21 year/female	1	Right mandibular mental region
Liu D et al [19]	2019	12 year/female	1	Left mandibular body
Makrami AM et al [20]	2021	13 year/male 16 year/male	2	Left mandibular first molar Right mandibular second molar
Barbur I et al [21]	2021	9 year/female	1	Mandibular body and ramus
Philip LM et al [22]	2021	8 year/male	1	Right mandibular molar
Rohini K et al [23]	2022	10 year/female	1	Left mandibular molar
Arslan SY et al [24]	2023	12 year/female	1	Right mandibular molar and ramus
Yoshida Y et al [25]	2023	12 year/female	1	Right mandibular third molar

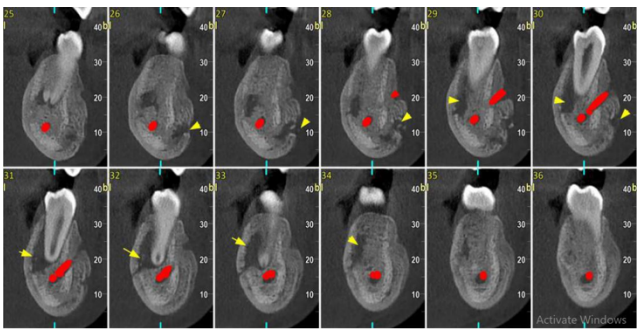

Figure 5: CBCT– Cross sections showing radiolucent defect on buccal cortex with sub-periosteal bone deposition

documented instances are the result of an odontogenic infection caused by caries.[27] Non-odontogenic infections, fractures, and periodontitis are additional causes of infection in the jaw. In our instance, pulpal and periodontal origin was determined to be the source of infection. Similarly, Yoshida Y et al.[25] in revealed a case of paediatric GO brought on by an infection from bacteria in the lower wisdom teeth that was impacted. Whereas, Liu et al.[19] in 2018 & Arslan SY et al.[24] in 2023 outlined the circumstances of a 12-year-old kid who had proliferative periostitis and persistent osteomyelitis without a known cause of infection. Oulis C et al.[1] stated that dentists should be cognisant that, in children with ectopically erupting posterior teeth, the periodontium may be a possible site of infection for GO.

This disease entity is uncommon, however it is a member of the main chronic osteomyelitis group, which makes up 10.3% of all cases of osteomyelitis of the jaw.[14] According to reports, the average age of PO patients is 13 years old.[22] GO is treated by root canal therapy, antibiotic medication, incision and drainage, and purging of the infection source.[28] Barbur I et al.[21] described a case involving the orthodontic

treatment of a 9-year-old girl patient, whose goals were to reduce the growth of her face, relieve her TMJ pain, and slow down the eruption of her teeth. Table 2 summarises the numerous examples that have been documented in the literature up to this point.

Kawai et al.[29] alienated the mandibular PO into type I and type II according to the preservation of the original mandibular contour. Two subtypes are further identified within each kind. (Table 1)

Other conditions that can mimic the symptoms of Garre's osteomyelitis include syphilis, leukaemia, Ewing's sarcoma, hypervitaminosis A, infantile cortical hyperostosis (also known as Caffey's disease), and metastatic neuroblastoma.[15,24] Both Ewing's sarcoma and osteoblastic osteosarcoma should be considered in the differential diagnosis since in young people, these bone cancers might occasionally also exhibit laminated periosteal response.[25]

4. Conclusion

GO is allied with low-grade infection ordinarily ascending from an infested tooth that fallouts in stimulus of bone formation. This type of lesion often comes in a neglected patient with low family educational level. Management of osteomyelitis is children are crucial as they are in the growing phase. Early health education must be given to the patient regarding the possible sequelae of the infection and the patient should be motivated for the early treatment.

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None.

6. Conflict of Interest

None.

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