

Case report

Management of Garre's osteomyelitis of the mandible with utility of cone beam computed tomography: A case report

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ABSTRACT

Garre's osteomyelitis or proliferative periostitis is a chronic osteomyelitis condition in young individuals. It is many times correctly diagnosed in a later stage due to less chances of clinical encounter by dental professionals. This is a report of a case of proliferative periostitis in a 9 year old boy who came with a chief complaint of painful swelling in the right lower third of the face for the past 1 month. On extraoral examination, there was a localized swelling over the right side of the mandible in the posterior aspect without any secondary changes. On palpation, it was felt hard in consistency and non-tender. There was a mild expansion of the lingual and buccal cortex in the region of 46. CBCT imaging was done which showed laminated appearance of new periosteal bone formation in the inferior border of the mandible and along the buccal cortex. Endodontic management of 46 and antibiotic therapy was given to the patient.

Keywords: Garre's osteomyelitis; proliferative periostitis; CBCT; endodontic therapy; antibiotic therapy.

INTRODUCTION

The origin of the term 'Osteomyelitis' was from the Greek words 'osteon' meaning bone and 'muelinos' meaning marrow. It meant infection of the medullary space of bone. It can either be acute or chronic. Garre's Osteomyelitis can also be termed as Chronic non-suppurative Osteomyelitis of Garrè, Periostitis Ossificans, Garrè's Proliferative Periostitis and Chronic Osteomyelitis with proliferative periostitis (1). It is classified into suppurative and non-suppurative by Cierny *et al.*, (2). It is generally seen in children and adolescents (1). Mostly affects men and commonly occurs in the mandible, especially in the lower border adjacent to first molar (3). Clinically, it is seen as a hard swelling over the jaw leading to facial asymmetry (1). It is insidious in onset and non-progressive nature. Also has a tendency for involvement of multifocal sites (4). Pain is not very common but severe pain can occur once secondarily infected (3). It can sometimes result in fistulas of the skin (4). Radiographs show typical 'onion skin appearance' due to deposition of lamellae of new bone in the subperiosteal region of the outer cortex. Blood investigations might show a rise in markers of acute inflammation like ESR and CRP (5).

Case report

A 9-year-old male patient reported with a chief complaint of painful swelling in the right lower third of the face for the past 1 month. History revealed that he had a painful decayed tooth in the lower right back region of jaw for the past few weeks and he underwent root canal treatment for the same. The swelling was gradual in onset and increased in size slowly to reach the present size. There was no history

of pain or discharge. Patient gave a history of taking antibiotics for more than 2 weeks.



Fig. 1: Profile of the 9 year old boy showing swelling in the right lower third of the face

On extraoral examination, there was a localized swelling over right side of the mandible in the posterior aspect roughly measuring 2 x 2 cm in size without any secondary changes (Fig. 1). On palpation, it felt hard in consistency and non-tender. On intraoral examination, there was a mild expansion of the lingual and buccal cortex in the region of 46 which felt hard in consistency and non-tender. The tooth 46 showed restoration (Fig. 2).



Fig. 2: Intraoral image showing mild cortical expansion in the region of 46 and restoration in the tooth 46.



Fig. 3: Panoramic image showing laminated appearance in the inferior border of the mandible in the region of 46.

Based upon the above clinical findings, a provisional diagnosis of antibioma was given in relation to 46 and a differential diagnosis of proliferative periostitis was considered. Primary investigation was done using panoramic imaging which showed well-defined linear radiopaque lines (laminated appearance) in the inferior margin of the mandible in the region of 46 suggestive of onion-skin appearance (Fig. 3). The periapical region of 46 showed an ill-defined radiolucency suggestive of early osteomyelitic changes. CBCT imaging was done which showed laminated appearance of new periosteal bone formation in the inferior border of mandible and along the buccal cortex (Fig. 4).

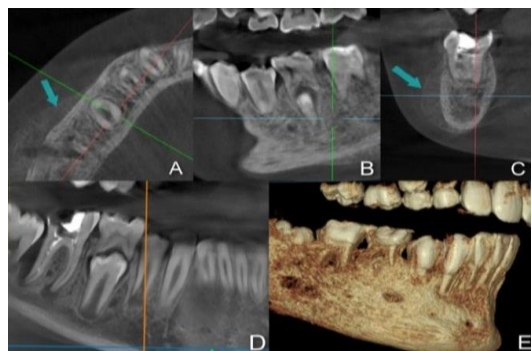


Fig. 4: CBCT slices A) axial B) sagittal C) cross-sectional D) reconstructed panoramic E) reconstructed 3D showing laminated appearance of new periosteal bone formation in the inferior margin of mandible and along the buccal cortex. 4 A shows breach in the buccal cortex.

The axial slice showed the breach in buccal cortex (Fig. 4 A). Based on the radiographic findings, a final diagnosis of periapical infection in the 46th region leading to Garre's osteomyelitis was given. Access opening was done in 46 followed by saline irrigation. Triple antibiotic paste was applied and closed dressing given with zinc oxide eugenol in 46. The following medications were prescribed: Amoxicillin and Potassium Clavulanate (625 mg), metronidazole (200 mg) and paracetamol (250 mg) twice daily for 3 days. There was a significant reduction in the size of the swelling after two months.

DISCUSSION

The common etiologies for periostitis ossificans are periapical infections of lower molars, periodontal

infections, nonodontogenic infections, untreated fractures, unerupted teeth, previous extraction sites, budding tooth follicles, pericoronitis, lateral odontogenic inflammatory cysts and buccal bifurcation cysts (6). The pathological process involves the spread of low grade infection from the affected tooth towards the outer surface of the bone, inflammation of the periosteal layer, granulation tissue and eventually reactive bone formation. As the newly formed layer of bone is lifted from the cortex, the inner cambium forms another new layer of bone below. This continuous process results in the classic onion skin appearance in radiographs (7). The duration and degree of symptoms depend on factors like virulence of the organisms involved, underlying diseases if present and immune status (8). One of the earlier studies classified Garre's osteomyelitis into two distinct types. In type I the original contour of the mandible is maintained as seen in radiographs. In type II there is loss of contour and has two subtypes. Type II subtype 1 shows new bone formation as well as resorption of the original cortex seen as osteolytic areas. Type II subtype 2 shows bone deformation with a dense homogenous osteosclerosis which makes the original cortex perceivable (9). Previously Computed Tomography (CT) has been widely used for diagnosing maxillofacial diseases but after the advent of CBCT, the amount of exposure to the patient was tremendously reduced since almost all of the bony lesions can be clearly identified in CBCT. The typical onion skin appearance was clearly seen in the CBCT images in our case in both buccal and inferior aspect of the mandible which is not possible in 2D imaging. Owing to similar onion skin appearance, osteosarcoma, fibrous dysplasia, infantile cortical hyperostosis and also Ewing's sarcoma could be considered as radiographic differential diagnoses (2). Elimination of periapical infection via endodontic management is found to be effective in resolution of most of the cases. Systemic antibiotics along with gentamicin irrigation can be a treatment option. Although calcium hydroxide dressings are found to be having better results without antibiotic therapy (1). According to a 2021 journal, the latest treatment involves bone resection followed by transport distraction osteogenesis. Remodelling of bone (usually mandible) occurs after resolution of infection but sometimes does not remodel necessitating the recontouring surgical procedures (2).

CONCLUSION

Garre's osteomyelitis is commonly seen in younger individuals with low grade chronic infection in the mandible resulting in periosteal stimulation and new bone formation. It is seen clinically as a bony hard swelling in the affected region of the mandible and radiographically shows typical 'onion skin appearance'. CBCT imaging has replaced CT scan in viewing proliferative periostitis lesions and does not

pose risk of high radiation exposure in younger individuals. Endodontic management, systemic antibiotic therapy and surgical recontouring of bone are the various treatments carried out. In this case, CBCT imaging was carried out which showed classical appearance and conservative endodontic management was done with antibiotic therapy.

CONFLICT OF INTEREST

Authors declare no conflicts of interest.

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