

Management of garre’s sclerosing osteomyelitis in a pediatric patient with the help of endodontic therapy- A case report

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Abstract

Aim: Children and young adults due to odontogenic infection as dental caries gets affected by a type of chronic osteomyelitis known as Garre’s sclerosing osteomyelitis. The case report intends to present the clinical, radiographic findings as well as treatment outcome for a patient diagnosed with Garre’s osteomyelitis. The case report supports the clinical findings with suitable radiographs.

Case Report: An 11 year old boy reported to the department of Pediatric and Preventive Dentistry with pain and swelling following periapical infection in relation to permanent mandibular left first molar. The patient was diagnosed with Garre’s osteomyelitis with the help of clinical and radiological examinations. Endodontic

therapy was used to eliminate periapical infection and the patient was evaluated after three months post operatively.

Conclusion: Because in pediatric patients the symptoms are less severe than adults, history taking, clinical examination and diagnosis plays a vital role. Follow up is also essential in such cases.

Introduction

Mild Irritation or infection that causes local thickening of the periosteum is known as Garre’s osteomyelitis. Carl Garre first described Garre’s osteomyelitis In 1893, as a chronic non suppurative sclerotic bone inflammation exhibiting rigid bony swelling at the periphery of the jaw, commonly seen in children and adolescents. The lower margin of the mandible is most commonly affected. Since the lesion expands unilaterally to the outer surface of the

bone, patients's suffering from Garre's osteomyelitis clinically exhibit facial asymmetry. Though not a characteristic finding, if the lesion gets secondarily affected such patients may complain of severe pain.

The duration of the lesion and the degree of calcification determines the radiographic appearance. In the early period, a thin crust-like convex layer is seen over the cortex. The cortex further thickens due to new bone deposits with progression of the lesion. This lamellar structure is known as "onion skin" on the radiographs. High quality radiographs reveal radio opaque bone laminations which are arranged almost parallel to each other and to the underlying cortical surface. Repeated perforation of the outermost new bone followed by restripping of the periosteum which results in layering of bone is seen due to periodic exacerbation and remission of the disease.^{1,2} Radiographs are routinely used for diagnosis of Garre's osteomyelitis and is of high diagnostic value.³

Staphylococci pyogenes, variety aureus or albus are the microorganisms isolated in most cases, although various Streptococci and some mixed organisms can be associated.⁴ The typical evolution of the lesion is due to high osteoblastic process than osteolytic process which is attributed to the osteogenic potential in young patients. The pattern is similar to condensing osteitis, seen in the periapical areas of carious teeth, where the proliferation of bone is endosteal in origin and not perosteal.

Case Report

An 11 year old boy reported to our department with pain and swelling on the left mandibular first molar region(36). The swelling resulted due to an infection six months previously. The patient was treated with antibiotic therapy, but without successful results. Examination revealed a diffuse swelling of the left side of the body of the mandible which was hard in consistency with mild

tenderness. Skin and mucosa over the swelling appeared normal. [Fig. 1]

In the intraoral examination it was found that the left mandibular first molar(36) had a deep caries cavity and was not mobile. An orthopantomograph revealed an area of diffuse radiopacity suggesting osteosclerosis extending from 34 to 37 which is associated with a periapical radiolucency involving the mesial and distal root of 36 (Fig. 2). Occlusal radiograph of mandible revealed 'onion skin' appearance which represents the peripheral subperiosteal bone deposition on the left side. (Fig. 3) Based on the radiographic evaluation of OPG, occlusal radiograph it was concluded to be a case of Garre's sclerosing osteomyelitis and endodontic treatment was planned. In the first visit root canal access was done followed by irrigation with 2.5% sodium hypochlorite solution and closed dressing was given with water based calcium hydroxide (Avuecal) and zinc oxide eugenol cement in 36. One week later when root canals were reopened, canals were dry and there was no discharge from the canals, but the extraoral swelling did not subside. So, considering the microorganisms associated with the etiology of Garre's osteomyelitis it was decided to use a mixture of metronidazole⁵ and gentamycin infusion solutions⁶(1:1)[Fig.5] as irrigating solution, canals were dried and closed dressing was given with zinc oxide eugenol cement. The root canal dressing was changed in 36 on weekly basis for three weeks, till the hard swelling subsided completely [Fig.6] then the canals were obturated with gutta percha and access cavity filled with glass ionomer cement. The stainless steel crown was cemented two weeks after obturation as a semi-permanent restoration. After three months on recall visit, intraoral periapical radiograph showed complete remodeling of bone.(Fig.7)

Discussion

This case report presents the typical features of Garre's sclerosing osteomyelitis, a rare but well-described complication of chronic odontogenic infections. Localized periosteal thickening is caused due to mild irritation or infection which is otherwise known as Garre's osteomyelitis.^{7,8,9,10} Stimulating bone formation occurs due to moderate infection from dental decay, periodontal disease, or soft tissue disease starting from the spongiosa layer extending into the periosteum. Along with high periosteal osteoblastic activity balance between the virulent bacteria and oral flora must be impaired for this pathological condition to occur^{7,11}. Following two reasons could account for this growing incidence of this rare form of bone infection:

1. As a result of the increase of health and living standards, people are responding in a "anabolic rather than catabolic manner"
2. The virulence of microorganisms has been affected due to increased use of antibiotics, converting an osteolytic process into an osteoblastic one. If the dentist concentrates on eliminating the causal factor than depending on antibiotic therapy the incidence of Garre's osteomyelitis can be prevented.

Except if the cause is unknown the diagnosis of Garre's osteomyelitis doesn't need biopsy. Conventional radiographic methods or CT images are sufficient to diagnose this condition. Periapical infection in the first mandibular molar was evident from radiograph as the affected area revealed increased radio density, which may be attributed to osteosclerosis. An onion-skin appearance characteristic of Garre's osteomyelitis is due to fusiform bony mass with two radiopaque lamellae outside the original buccal cortex revealed in OPG and occulsal radiographs, (Fig. 2,3). The obvious clinical and radiographic features found in our case confirmed the

diagnosis, a biopsy was not required. The main treatment goal for Garre's osteomyelitis is to eliminate the etiologic factor, either by endodontic treatment or by extracting the tooth in question. Batcheldor *et al.* suggested the efficacy of endodontic intervention in the management of Garre's osteomyelitis.^{14,15} In this case we considered endodontic therapy as the tooth was restorable and the patient's parents agreed on long term follow up which is crucial in the success of endodontic therapy.

Garre's osteomyelitis and Caffey disease may exhibit similar "onion skin" appearance in the bone. However, Caffey disease has early age of onset (prior to two years of age) with it being bilaterally involved, more common in the ramus and angulus region of the mandible while occurring in multiple bones.⁴

Though Ewing's sarcoma is similar to Garre's osteomyelitis but can be distinguished from Garre's osteomyelitis. Osteophyte production, causing bone enlargement too rapidly and causing more osteolytic reactions in the bone gives the typical "sun-ray" appearance in Ewing's sarcoma. It also exhibits frequent complications such as facial neuralgia and lip paresthesia.^{7,13}

Osteosarcoma also presents with a hard bone mass on the bone surface. Can be distinguished from Garre's osteomyelitis with a "sun ray" appearance which is characteristic feature of malignant tumors and periosteal reactions in the form of a Codman triangle in radiography.⁷

Fibrous dysplasia is another pathologic condition requiring a differential diagnosis. Fibrous dysplasia though not associated with any dental infection it is distinguished from Garre's osteomyelitis by its "ground glass appearance" as well as the thinning seen in the cortex. In addition, the enlargement seen in fibrous dysplasia is in the internal structure of the bone whereas

the outer surface of the cortex enlargement while the presence of the original cortex can be detected within the enlarged portion of the jaw while a careful examination in Garre's osteomyelitis.^{1,7,12,13}

Peripheral osteomas, torus, and exostosis with hard, nodular, or pedunculated masses presents radiographically as a dense, uniform radiopaque mass extending outward from the cortex. While Garre's osteomyelitis exhibits regular contours. The ossifying subperiosteal hematoma may also have a clinical appearance similar to that of Garre's osteomyelitis. However, it can be distinguished by trauma history and the mottled appearance or trabecular structure and not exhibiting uniform radiopacity.⁷

Different opinions exist regarding the most appropriate treatment for Garre's osteomyelitis. Though hyperbaric oxygen therapy and endodontic treatment is successful, the accepted treatment is the administration of antibiotics and the extraction of the infected tooth.^{6,9}

Reference

1. Oulis C, Berdousis E, Vadiakas G, Goumenos G. Garres osteomyelitis of an unusual origin in a 8 year old child:A case report. *Int J Pediatr Dent* 2000;10:240-4
2. Neelima M. Osteomyelitis and osteo radionecrosis of the jaw bones. *Textbook Oral Maxillofac Surg* 608-11
3. Eswar N. Garres Osteomyelitis:A case report. *J Indian Soc Pedo Prev Dent* 2001;19:157-9.
4. Monteleone, L.; Hagy, D.; and Hernandez, A. Garre's osteomyelitis, *J Oral Surg*, 20:62, Sept., 1962.
5. Sandeep Dubey, Suparna Ganguly Saha, Balakrishnan Rajkumar And Tapan Kumar Dhole. Comparative antimicrobial efficacy of selected root canal irrigants on commonly isolated microorganisms in endodontic infection. *Eur J Dent*. 2017 Jan-Mar; 11(1): 12–16.
6. Suma R, Vinay C, Shashikanth M.C, Subba Reddy V.V. *J Indian Soc Pedod Prevent Dent* 2007.
7. F. R. Karjodkar, *Textbook of Dental and Maxillofacial Radiology*, Jaypee, Panama City, Panama, 2nd edition, 2009.
8. R. Suma, C. Vinay, M. C. Shashikanth, and V. V. Subba Reddy, "Garre's sclerosing osteomyelitis," *Journal of the Indian Society of Pedodontics and Preventive Dentistry*, vol. 25, pp. 30–33, 2007.
9. M. T. Brazao-Silva and T. N. Pinheiro, "The so-called Garrè's osteomyelitis of jaws and the pivotal utility of computed tomography scan," *Contemporary Clinical Dentistry*, vol. 8, no. 4, pp. 645-646, 2017.
10. D. Singh, P. Subramaniam, and P. D. Bhayya, "Periostitis ossificans (Garrè's osteomyelitis): an unusual case," *Journal of the Indian Society of Pedodontics and Preventive Dentistry*, vol. 33, no. 4, pp. 344–346, 2015.
11. Y. Suei, A. Taguchi, and K. Tanimoto, "Diagnosis and classification of mandibular osteomyelitis," *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, vol. 100, no. 2, pp. 207–214, 2005.
12. Schultz C, Holterhus PM, Seidel A, et al. Chronic recurrent multifocal osteomyelitis in children. *Pediatr Infect Dis J* 1999; 18:1008-13.
13. S. C. White and M. J. Pharoah, *Oral Radiology: Principles and Interpretation*, Mosby, St. Louis, MO, USA, 6th edition, 2009.
14. Gonclaves M, Oliveira DP, Oya EO. Garres Ostoemyelitis associated with a fistula: A case report. *J Clin Pediatr Dent* 2002;26:311-4.
15. Batcheldor GD, Giansanti JS, Hibbard ED, Waldron CA. Garre's osteomyelitis of the jaws: A review and report of two cases. *J Am Dent Assoc* 1973;87:892-7.

Legend Figures

Preoperative



Fig.1: Extra-oral photograph showing a diffuse non-tender hard swelling on left side of mandible



Fig. 4: Intraoral Photograph Showing Grossly Carious 36



Fig.2: Pre-operativeOPG showing chronic periapical abscess



Fig.5: Metronidazole and Gentamicin solution used in 1:1 ratio used for irrigation



Fig.3: Mandibular Occlusal Radiograph Showing The Peripheral Sub-Periosteal Bone Deposition

Postoperative



Fig.6: 3 months recall visit- Extra-oral photograph showing complete recession of hard swelling on left side



Fig. 7: 3 months recall visit- intra-oral periapical radiograph of 36 showing complete healing of periapical lesion