



CASE REPORT

Foreign Body Giant Cell Granuloma of the Mandible Subsequent to Endodontic Surgery

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ABSTRACT

Granuloma formation is a specific type of chronic inflammation initiated by infectious and noninfectious agents with an aggregation of multinucleated giant cells. Foreign body giant cells (FBGCs) most commonly observed at the tissue/material interface where the size of foreign particulate is too large to permit macrophage phagocytosis. In this context, adherent macrophages and FBGCs constitute the foreign body reaction. Foreign-body giant cell granulomas have been reported to cause clinical symptoms from months to decades after a surgical procedure and can present with a variety of symptoms, usually on the basis of location. Foreign-body giant cell granulomas in the mandible are rare lesions, here we report a case of FBGC granuloma in the mandible that developed after endodontic treatment.

Keywords: Foreign body, Giant cell granuloma, Phagocytosis, Polarized microscopy.

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INTRODUCTION

Foreign body giant cells (FBGCs) are generated by macrophage fusion and serve the purpose of degradation of the underlying substrate. Foreign body giant cells, together with their macrophage precursors, adhere to different synthetic surfaces.¹ Foreign-bodies can penetrate soft tissues in connection with accidents through open wounds and lacerations.² Although foreign body reactions are commonly associated with trauma related

events, it can be seen postoperative dental procedures. A proper history, clinical evaluation and the appropriate investigation will help us in diagnosis and treatment of these conditions with accuracy.

CASE REPORT

A 21-year-old male patient reported to our institution with a chief complaint of pain and swelling in relation to lower anterior region. Panoramic radiograph revealed a well defined radiolucency extending from 35 to 45 region (Fig. 1). Right submandibular lymph node was palpable and tender. Lesion was enucleated and root canal treatment was done. It was histopathologically reported as radicular cyst.

After 6 months patient again visited with the complaint of pus discharge and sinus tract opening in the submental region associated with inflammation of the surrounding tissue. On intraoral examination no abnormality was detected. The lesion had removed surgically and sent for histopathological examination.

A microscopic examination showed a fibrous connective tissue mass densely infiltrated with chronic inflammatory cells predominantly lymphocytes, plasma cells, macrophages and numerous multinucleated giant cells with cytoplasmic inclusion body, extracellular foreign body material and eosinophilic material. Acute inflammatory cells like neutrophils and eosinophils were also observed. The histopathological findings were conclusive of FBGC granuloma (Fig. 2). Presence of foreign material was further substantiated with polarized microscopy (Fig. 3).

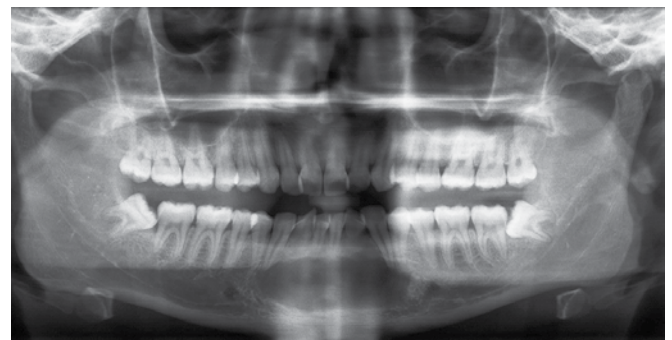


Fig. 1: Well-defined radiolucency extending from 35 to 45 region

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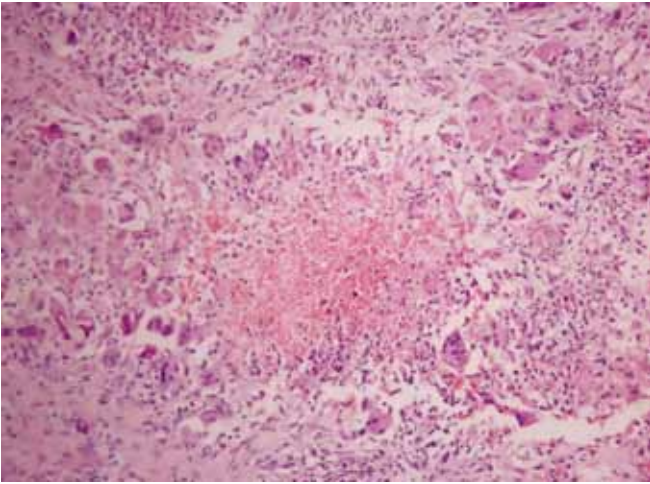


Fig. 2: Numerous multinucleated giant cells seen scattered throughout the lesion (Hematoxylin and Eosin stain: 200x)



Fig. 3: Polarizing microscopy showing foreign material (400x)

DISCUSSION

Granuloma formation is a specific type of chronic inflammation characterized by accumulation of modified macrophages and initiated by infectious and noninfectious agents.³ Granuloma also develops in response to relatively inert foreign bodies forming foreign body granulomas. The formation of granuloma effectively 'walls off' the offending agent. However, granuloma formation does not always lead to eradication of the causal agent, which is frequently resistant to killing or degradation and may result in granulomatous inflammation and subsequent fibrosis.⁴

Foreign body giant cells most commonly are observed at the tissue/material interface of implanted medical devices, prostheses and biomaterials. Foreign body giant cells also are seen in tissues where the size of foreign particulate is too large to permit macrophage phagocytosis.⁵ Foreign body giant cells and macrophages constituting the foreign body reaction at the tissue-device interface are surface area dependent.¹ The initiation of a foreign body reaction in the periapical tissues can be either by

exogenous materials like talc-contaminated gutta-percha, the cellulose component of paper points, cotton wool and food material of vegetable origin or endogenous cholesterol.⁶ These endogenous crystals, which are believed to be released from disintegrating host cells, such as erythrocytes, lymphocytes, plasma cells and macrophages in the inflamed periapical connective tissue and/or circulating plasma lipids can act as foreign bodies and provoke a giant cell reaction.⁷ These inert particles were unable to induce an immune-specific reaction, as a result they elicited a foreign-body granuloma in the mandible. In this case, pus discharge was the patient chief complaint. Possibly, the symptoms were caused by the increase in the size of the lesion and superimposed infection.

Radiographic findings are usually a combination of osteolytic and/or osteoblastic presentations with failure to visualize the radiolucent foreign body and recent image techniques should be used. The radiographic appearance of the granuloma located in the mandible could be similar to other lesions, such as odontogenic neoplasms and cysts, because these entities can produce calcifications, which could resemble the foreign material image. Foreign-body granuloma has frequently been documented as mimicking a variety of neoplasms.²

Microscopic features include foreign bodies of variable morphologies with or without granuloma formation, multinucleated giant cells and acute or chronic inflammatory infiltrate.⁸ Foreign body giant cells contain many nuclei that are arranged in a diffuse manner throughout the cytoplasm.

Usually organic and inorganic substances with rigid yet repeatable structures like crystals, sand, talc, wood, amyloid and other fibrillary structures are seen on polarized light microscopy. On polariscopic examination different foreign bodies have characteristic appearance.⁹ Our case showed diffusely scattered refractile foreign particles with irregular shapes and FBGCs were found most numerous near foreign particles. So, we suspect a foreign body reaction of periapical tissue to root-filling materials.

Foreign bodies located in the mandible resulted from a traumatic implantation are rare. According to Heo et al no foreign body granuloma occurring in the mandibular area has previously been cited in literature, being his report the first one.¹⁰ Vanessa Ávila Sarmento Silveira et al reported a case of intraosseous foreign-body granuloma in the mandible subsequent to a 20-year-old work-related accident.² Ding et al reported a case of foreign body granuloma in submental region that resulted from a fish bone embedded in the floor of mouth.¹¹

Surgical complete removal of the FBGC granuloma is the first choice of treatment. Prognosis is good and recurrences are rare with effective treatment.

CONCLUSION

Foreign-body giant cell granuloma has frequently been documented as mimicking a variety of neoplasias. Identification of these rare lesions are important to prevent unnecessary surgery or inappropriate treatment. Dentists should be familiar with their features and include them in the differential diagnosis of tissue masses, mainly in the presence of previous surgery or accidental trauma history.

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