

Intraosseous foreign-body granuloma in the mandible subsequent to a 20-year-old work-related accident

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Abstract

The purpose of this article was to describe the clinical and microscopic features of an intraosseous foreign-body granuloma in the mandible that developed after the traumatic implantation of metal fragments during a work-related accident. A 65-year-old male patient had a severe pain in the body of mandible. Clinical examination showed facial asymmetry and a scar, extending to the left mental region. Intraoral examination revealed a soft mass involving the left alveolar bone with normal appearance of the mucosa surface. Panoramic radiographs showed a radiolucent lesion along the mandible extending from the central incisive to the first molar. Computed tomography revealed an osteolytic mass in the same area. His medical history included a work-related accident twenty years prior to evaluation. During the biopsy an important amount of bright metal-like pieces surrounded by soft tissue were found. A microscopic examination showed a foreign body associated with an aggregation of multinucleated giant cells. The final diagnosis was a foreign body granuloma. Even though foreign-body granulomas in the mandible are rare lesions, dentists should be familiar with their features and include them in the differential diagnosis of tissue masses.

Key words: *Granuloma, foreign-body, mandible, giant cells, inflammation.*

Introduction

There are circumstances in which the substances that provoke the acute inflammatory reaction are particulate and larger than the phagocytes and cannot be digested by the reacting neutrophils, causing another response, namely granulomatous inflammation. The macrophages are the basic structural unit of chronic inflammation. After amassing substances that they cannot digest, macrophages develop into epithelioid cells. Granulomas are collections of epithelioid cells, which are frequently surrounded by mononuclear cells. In addition, granulomas are populated by multinucleated giant cells,

which are formed by the fusion of macrophages (1). Granuloma formation has been linked to a variety of conditions. Hannon et al. (2) reported a silica granuloma of the lip. Odell et al. (3) reported a foreign-body giant cell reaction elicited by an haemostatic alginate. However, accidental implantation of dental amalgam occurs more often. Owens et al. (4) published a study showing that oral amalgam tattoos accounted for almost 1% of approximately 19.000 pathology reports on file. The literature reveals a number of studies on granulomas as a result of silicone injection for lip enhancement (5,6).

Foreign-bodies can penetrate soft tissues in connection with accidents through open wounds and lacerations (7). The presence of a foreign-body that causes a granuloma, impairs the healing of the tissues. Some reports on foreign-body granuloma originating from a traumatic implantation have been published, with different objects, including fish bones (8), teeth (9) and metallic material (10). However, intraosseous foreign-body granulomas associated with work accidents are rarely founded. The purpose of this article was to describe the clinical and microscopic features of a rare intraosseous foreign-body granuloma in the mandible that developed after the traumatic implantation of fragments during a work-related accident.

Case Report

A 65-year-old male patient sought assistance and evaluation, in the Multidisciplinary Center for Mouth Disease of the Dentistry School of São José dos Campos - UNESP, with the chief complain of a severe pain in the mandible body, accompanied by a burning sensation. He indicated that the pain and the discomfort had begun 3 weeks earlier and increased when the region was touched.

Clinical examination showed facial asymmetry, characterized by a diffuse swelling near the chin and a scar, extending to the left mental region. Submandibular and cervical lymphonodes were negative on palpation.

Intraoral examination revealed a soft mass involving the left alveolar bone with normal appearance of the mucosa surface. Panoramic radiograph showed a radiolucent lesion along the mandible, with a diffuse contour, extending from the central incisor to the first molar. Discrete radiopaque areas and discontinuity of the base of mandible were observed (Figure 1). Computed tomography revealed an osteolytic mass in the same area.

His medical history included hypertension and a work-related accident twenty years prior to evaluation, while cutting fiber cement-based roofing with a disk. The disk broke and a fragment struck his face. He received several injuries to facial tissues, a mandible fracture, loose teeth, temporary paresthesia and facial paralysis resulting from damage in some local nerves.

The differential diagnosis was a benign neoplasm, such as calcifying cystic odontogenic tumour, because of its radiographic appearance as a moderately defined radiolucency containing varying amounts of radiopaque material. An incisional biopsy was performed under local anesthesia, removing many fragments from the lesion. A lot of bright metal-like pieces surrounded by soft tissue diffused in the lesion mass (Figure 2) came to our attention. A microscopic examination showed a fibrous connective tissue mass presenting a diffuse and loose granulomatous arrangement with aggregated multinucleated giant cells, many of which surrounded dense, black or yellow foreign material (Figure 3). Some of these particles were birefringent. The final pathological report was a foreign-body granuloma.

Subsequent to the biopsy, the intensity of the pain was reduced. After explaining to the patient that the foreign-body granuloma occurred due to his traumatic accident, he became reluctant and declined the treatment. Being aware that the lesion was not a malignant tumour the patient refused to receive further surgery, even though some fragments still remained in the mandible bone tissue. Since then, he has been followed every 6 months. In a recent panoramic radiography it was observed that lesion aspects remain unaltered.



Fig. 1. Panoramic radiography showing foreign-body granuloma extending from the central incisor to the first molar.

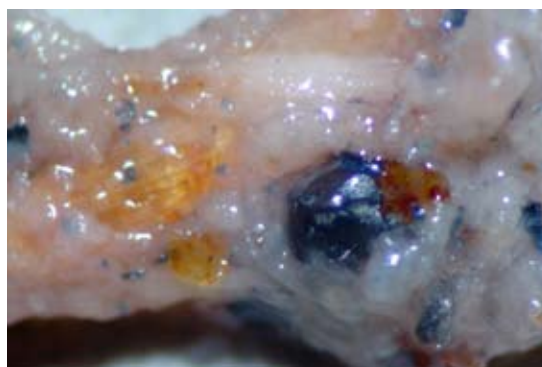


Fig. 2. Biopsy fragments presenting metal-like bright pieces associated to soft and hard tissue.

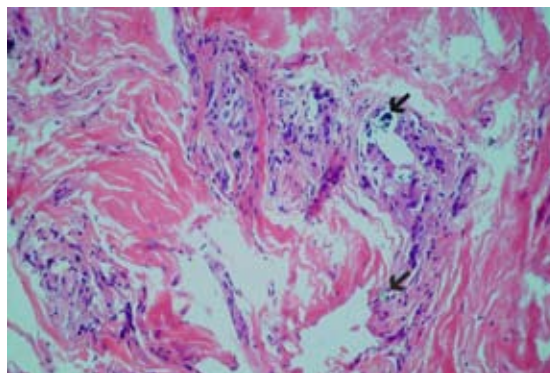


Fig. 3. Foreign material surrounded by loose granulomatous arrangement with aggregated multinucleated giant cells. Medium power.

Discussion

Two basic categories of etiologic factors are recognized as inducers of granulomatous inflammatory responses. The first comprises inert substances that are unable to incite any specific inflammatory or immune response. These are artificially termed foreign-body typed agents and although non-immunogenic, their chemical properties render them able to generate granulomas which differ in evolution, dynamics, duration, severity and involution rates from the infectious type (1).

The case report demonstrated a severe foreign-body reaction, probably to a metal fragment from the broken disk and from the material that the patient had been cutting during the original accident. These inert particles were unable to induce an immune-specific reaction, as a result they elicited a foreign-body granuloma in the mandible body. Considering both the fibrous aspects and the light inflammatory infiltrate of the lesion and the evolution period since the accident it is possible to corroborate the lack of immunogenicity on the part of the agent. However, these particles are still found in the lesion because of their size and non digestible characteristic.

The foreign-body can be detected as a radiographic finding in a routine exam. A painless reaction is, sometimes, a feature of this lesion, making diagnosis more difficult. In this case report, the accident occurred 20 years prior to examination. The fracture was treated and many years later, due to the severe pain, the patient sought professional care 3 weeks prior to the biopsy. In the literature, the period of evolution for foreign-body granuloma is variable, ranging between a few months and several years (8-11). The variation of the granuloma evolution can usually be associated with pain. Sometimes the foreign-body remains asymptomatic for a long time. Probably, the gradual tissue reaction caused discomfort, compressing adjacent structures for which the patient sought medical attention.

In this case, the severe pain was the patient chief complaints. Possibly, the symptoms were caused by the increase of the lesion and consequently loss of bone in the region. The tooth loss during the accident is another factor to enhance the bone loss, augmenting the proximity of the lesion and the oral mucosa surface to some local nerves. Because a history of injury may often be vague or forgotten and due to prolonged latent period, a high index of suspicion is necessary to diagnose a granuloma. Besides that, 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 (12).

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. Shugar et al. (13) presented a case of a foreign-body in the tongue which masqueraded as a malignancy. Furthermore, the foreign-body granuloma should be included in the differential diagnosis in cases of postoperative masses, particularly after a lengthy time interval, because most of them are associated with suture material (11). The use of substances as cosmetic fillers, such as silicone, may be associated with the occurrence of foreign body granulomas (14), and should be included in the differential diagnosis in cases of previous aesthetic procedures. Surgery to the complete removal of the foreign-body granuloma was the first choice for treatment. However, in this case, after the relief of the pain, and being aware that it was not a malignant tumor, the patient refused further surgery, avoiding any intervention in the accident local. The radiographic aspects 4 years after biopsy showed that lesion remain unchanged. Therefore, it is reasonable to assume that the lesion is stabilized. As a result the patient will continue to be followed.

Foreign bodies in the head and neck are common, including those of long duration. However, foreign bodies located in the mandible resulted from a traumatic implantation are unusual. According to Heo et al. (11) no foreign body granuloma occurring in the mandible area has previously been cited in literature, being his report the first one. No other case report about an intraosseous foreign body granuloma in the mandible subsequent to an accident has been found until this moment. Therefore, identification of these lesions is important to prevent inappropriate treatment.

Even though intraosseous foreign-body granulomas are rare lesions, 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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