SVOA Dentistry
ISSN:2753-9172

ScienceVolks Open Access

Case Report

Amalgam Tattoo in Atypical Edentulous Localization: Case Report

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Received: *May 20, 2021* ***Published:*** *May 26, 2021*

Abstract:

Amalgam tattoo is constituted by the deposition of metallic ions, resulting from residues of restorations or retrograde fillings with amalgam. Clinically it is characterized by a darkened macula and radiographically by a radiopaque image. However, radiographic features are not always visible. The diagnosis is based on clinical and radiographic features, with histopathological examination elucidative. The clinical differential diagnosis includes several pigmented or vascular lesions, among them melanoma and Kaposi's sarcoma. In this perspective, any pigmented lesion that cannot be diagnosed clinically or radiographically should be biopsied and referred for histopathological examination. The purpose of this article is to present a case of atypically located amalgam pigmentation in the edentulous region of tooth 22, which was removed by excisional biopsy and elucidated by histopathological examination.

Keywords: *dental amalgam; adverse effects; skin manifestations; oral diagnosis; oral pathology.*

Introduction

Amalgam tattoo is an accidental occurrence lesion resulting from dental procedures. It occurs due to the impregnation, deposition and corrosion of metallic ion pigments, particularly copper, silver and tin, responsible for the gamma 2 phase of conventional amalgams, in epithelial and connective tissues, and sometimes affecting the periosteum and bone tissue. There is no predilection for race, age or gender[1-11]. In 2018, Tavares et al.[12] reviewed 458 pigmented lesions of the oral cavity over 64 years (1952-2016), of which 212 cases (46.3%) were diagnosed as amalgam tattoo. More recently, a retrospective review of two oral pathology services in Brazil, evaluated 77,074 diagnosed lesions over 45 years (1974-2019). Of these, 761 (0.99%) represented pigmented lesions of the oral mucosa, of which 351 (46.1%) were melanocytic and 410 (53.9%) were non-melanocytic lesions, among which 408 were amalgam tattoo[13].

Generally, amalgam tattoo has typical clinical and radiographic features. However, radiographic features are not always present and the diagnosis is elucidated by histopathological examination[1,2,4,5,7-11,14-17]. This alteration can be found more frequently in the gingiva or alveolar ridge, near teeth with amalgam restorations or teeth that have undergone retrograde amalgam filling. In edentulous areas, historic is common of teeth with amalgam restorations that have been extracted, or on adjacent teeth. Amalgam tattoo is usually asymptomatic[9-11,17]. However, Weaver et al.[4] (1997) reported a case of amalgam tattoo related to headache, orofacial pain, sinusitis and TMD.

Recently, amalgam tattoo was classified by the Consensus Report of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions as gingival diseases - non-dental plaque -induced, gingival pigmentation (item 3, H, iv)[18].

Amalgam tattoo has its clinical importance in the differential diagnosis of various pigmented lesions. Some mucocutaneous lesions may manifest themselves in the oral cavity mucosa, preceding the systemic manifestation. Among the lesions that can affect the mucosa of the oral cavity are dermatological lesions (racial pigmentation, melanoacanthosis, chloroquine pigmentation, heavy metal pigmentation, simple and compound pigmented nevus), vascular (hematomas, varicose veins and hemangiomas), neoplastic (melanoma, Kaposi's Sarcoma) and specific pigmentations in syndromes (Albrights, Peutz-Jeghers, Addison)[1-3,7,8,10,11,13,14,17,19]. From this perspective, the final diagnosis is important for the reassure of the patient and the professional.

The purpose of this paper is to present a case of atypically located amalgam tatto in the edentulous region of tooth 22, which was removed by excisional biopsy and elucidated by histopathological examination.

Case Report

An African-descendent male patient, 39 years-old, presented with a complaint of a lesion in his mouth.

Clinically, a symptomatic blackish-colored macula was observed, with poorly defined borders, presenting in its center a fistula and purulent secretion; measuring approximately 8mm in diameter; located in the buccal keratinized gingiva of tooth 22, with 2 years of evolution (Figure 1).

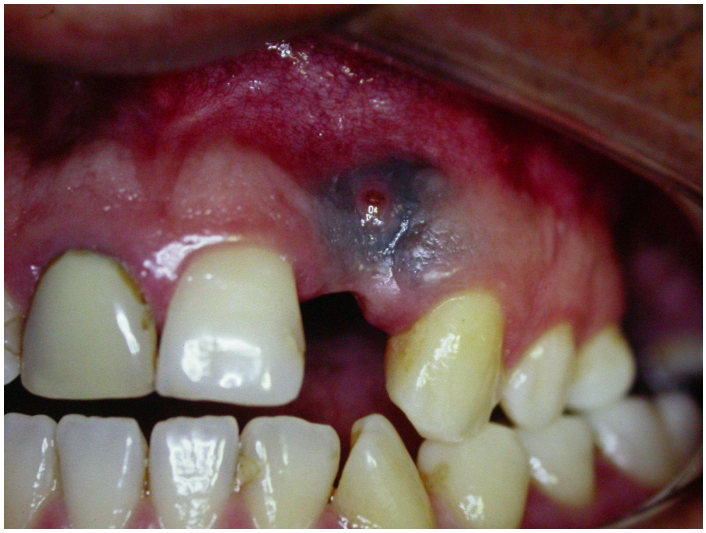

Figure 1: *Blackish macula with fistula and purulent secretion in the buccal keratinized gingiva of tooth*

Fourteen years ago, a subgingival radicular caries restoration was performed on tooth 22, initiating the infectious process with purulent secretion. Two years ago, after exodontia, there was a reduction of the secretion, which was only evidenced by the formation of the fistula. Despite the remarkable clinical characteristics, no radiographic alterations inherent to the lesion were found.

Excisional biopsy and removal of the fistula was suggested. After written consent from the patient, the procedure was performed. Under local anesthesia, the lesion and the fistulae were removed and curetted, and the region was sutured. Analgesic, anti-inflammatory and antibiotic drugs were prescribed.

The lesion was fixed in 10% formalin and sent to the Laboratory of Surgical Pathology of the School of Dentistry of the University of São Paulo. Histological sections revealed a fragment of mucosa covered by parakeratinized stratified pavimented epithelium, showing acanthosis and hydropic degeneration. In the lamina propria, constituted by dense connective tissue, numerous fragments of exogenous material of dark brown color and reticular arrangement were observed scattered among the collagen fibers and in the perivascular region. The histopathological diagnosis was amalgam tattoo (Figure 2).

The patient progressed satisfactorily postoperatively, and the suture was removed after 10 days (Figure 3). No signs of fistula recurrence or purulent discharge were observed. The patient opted for no other procedure, only the diagnosis. At least, he was instructed to return to the dental service if recurrence of the purulent discharge was observed.

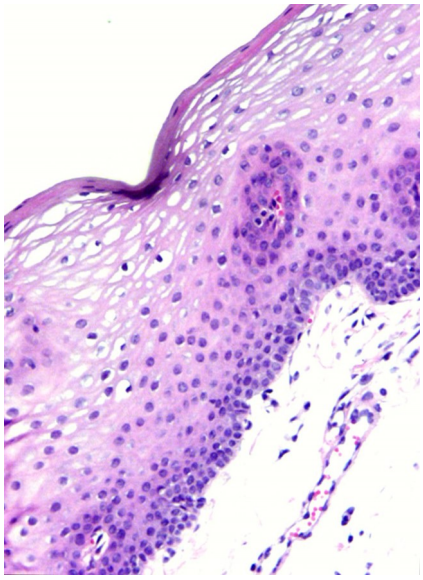

Figure 2: *Histopathology of amalgam pigmentation (Staining: HE; 20X magnification).*

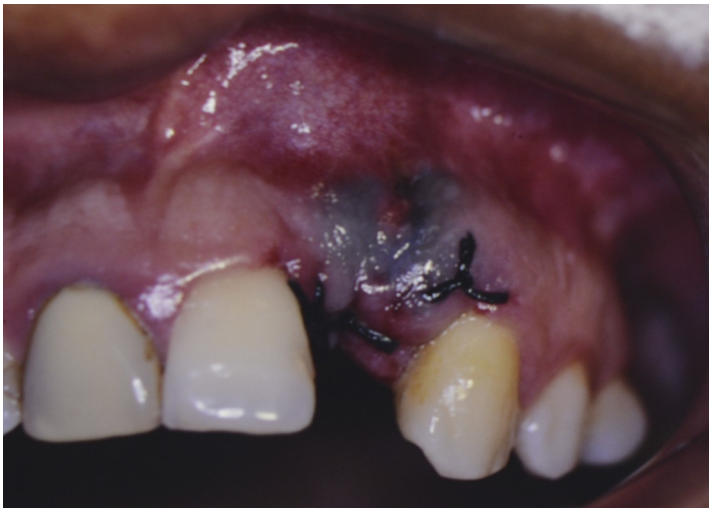

Figure 3: *Removal of the sutures, after 10 days postoperative.*

Discussion

Amalgam tattoo presents clinically as a asymptomatic dark stain or macula, usually bluish, black or brownish, with irregular, unclear or well-defined borders, usually single, although it can be multilocular, and of variable size. It is located in any region of the oral mucosa. However, it appears more frequently in the alveolar mucosa and gingiva, near teeth restored with amalgam or in edentulous areas with a history of restorations or retrograde fillings with amalgam[1,3-5,7-11,17,20].

Radiographically, radiopaque images can be seen, although not always apparent. The irregular, radiopaque particles, characteristic of foreign bodies, sometimes help in the diagnosis. However in several cases, these particles are diffuse or too small to be observed[1,2,4,16]. Despite typical clinical and radiographic features, one may encounter difficulties in elucidating the diagnosis. The radiographic image may be absent, when small fragments of amalgam are impregnated in the tissue. From this perspective, elucidation of the diagnosis requires biopsy[1,8,9,20]. In the present case, the clinical features presented and absent radiographic features were not sufficient to conclude the diagnosis, and it was elucidated only through histopathological examination.

Regarding histopathological characteristics, stained particles were observed as dark, fine, discrete, irregular and solid pigments in the stroma of the connective tissue, interposed between collagen and muscle fibers, nerve branches, blood vessels and acini of minor salivary glands. In some cases, the fragments can reach the bone tissue. The inflammatory reaction was variable[1-4,6-8,10,11,21], with the possibility of granuloma formation[4]. Granules have also been found inside cells such as histiocytes, macrophages, endothelial cells, multinucleated giant cells and fibroblastos. The lesion may have its size increased as a result of the activity of the giant cells, macrophages, and possibly by the tissue fluids, which were slowly able to hold and break down the amalgam fragments[1,6].

Amalgam tattoo does not require treatment, nor does it pose any health risk. Despite its asymptomatic nature, amalgam tattoo has been associated with Burning Mouth Syndrome, lichen planus, headache, orofacial pain, sinusitis and TMD, requiring removal[4,17]. In patients with gummy smile or esthetic complaint, or in the doubt or concern of the patient or the dental surgeon, an excisional or incisional biopsy has been indicated. Depending on the size of the lesion and opting for excisional biopsy, the curative nature of surgical removal is considered[1-4,6,9,11,20]. For aesthetic indications, some alternative treatments have been reported, such as the use of mucogingival reconstructive surgeries, particularly by the technique of free gingival graft, connective tissue graft, or use of acellular dermal matrix; electrosurgery; cryosurgery; radiosurgery; and mucoabrasion taking care to curet the bone pigmented by the amalgam[5,6,10,11,15,17]. Recently, Mathews[9] (2020) considered bone removal unnecessary, determining only grafting with thick epithelial tissue. The alexandrite (755nm) and ruby (694nm) lasers were used in pigmentation ablation, with the former showing a better result compared to ruby. Gingivoplasty (gingival pilling) was cited as an alternative therapeutic procedure [5,7,10].

The decline in frequency of amalgam tattoo is expected, due to reduce of amalgam restorations and other esthetic restorative materials being in vogue.

Conclusions

Amalgam tattoo is a lesion frequently found in clinical stomatology, presenting typical clinical and radiographic features. However, radiographic features are not always observed. The elucidation of the diagnosis occurs by histopathological examination, due to the amplitude of the clinical differential diagnosis. The histopathological diagnosis and the treatment when necessary are important to reassure the patient as well as the dentist.

Conflict of Interest

The authors declare no conflict of interest.

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Citation: Santos ADS, Varoli FP, de Medeiros JMF, Shitsuka C and Pedron IG. "Amalgam Tattoo in Atypical Edentulous Localization: Case Report". SVOA Dentistry 2:4 (2021) Pages 148-152.