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ORIGINAL ARTICLE

Inflammatory myofibroblastic tumor in the retromolar region of mandible: a case report and literature review

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Abstract:

Inflammatory myofibroblastic tumor (IMT) is a soft tissue tumor that is most common in lungs but it can be located in a large variety of anatomical sites. The occurrence in the oral cavity is rare and exhibits a wide spectrum of clinical behavior. This article is a case report and review of the literature of oral IMT presentation. Here, we report an unusual IMT in retromolar region on the left side in a 21-year old female patient. This is the second case of IMT in this anatomic region reported in English-language literature. IMT case reports are important to better understand the clinical, histopathological and behavioural aspects of this tumor. The complete surgical excision of the tumor seems to be the effective treatment.

Keywords: Oral Pathology; Granuloma, Plasma Cell; Soft Tissue Neoplasms; Mouth.

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INTRODUCTION

Inflammatory myofibroblastic tumor (IMT) was previously reported as "plasma cell granuloma of the lung"[1]. It was originally called "pseudotumor" because of its expansive growth and radiological aspect similar to malignant tumors[2]. In 1994, The World Health Organization described IMT as an intermediary tumor of the soft tissue, composed of differentiated myofibroblasts, spindle cells and numerous inflammatory cells including plasma cells with or without lymphocytes[3]. IMT has no preference of age and may range from 1 to 70 years. Male and female are involved equally[4].

The etiology and pathogenesis of IMT are unclear, however the chronic irritation seems to have a fundamental role, producing a marked progression of the inflammatory response. The result with an aggressive appearance is often mistaken for malignancy[5].

IMT occurs most commonly in lungs, but it can be located in a large variety of regions[6], including the head and neck, preferentially the paranasal sinuses. The occurrence in the oral cavity is rare[7].

IMT in oral cavity usually presents as an asymptomatic exophytic mass with a variable clinical behavior, being considered a border line lesion. An infiltrative and rapid growth mimics a malignant tumor and represents a challenge to the diagnosis. Clinically, oral lesions, appears as an exophytic tumor that grows without symptoms quickly. It can present a variable clinical behavior, being considered like borderline lesion[7,8]. Histologically, the lesion is composed by spindlle cells (myofibroblastics cells) that could show a large cytoplasm and mononuclear inflammatory cells[9]. The diagnosis is the current challenge.

The purpose of this paper is to report an inflammatory myofibroblastic tumor in retromolar region of mandible. Additionally, we conducted a review of the published literature on the inflammatory myofibroblastic tumor in mouth. The data base searched included PubMed/MEDLINE (http://www.ncbi.nlm.nih.gov/pubmed).

CASE REPORT

A 21-year-old woman was referred to the Oral Medicine Service of a public hospital in the city of Belo Horizonte (Minas Gerais, Brazil) with the complaint of an asymptomatic bleeding tumor in the left retromolar region. The oral examination revealed a tumor mass causing oral facial asymmetry in the left retromolar region adjacent to the mandibular third molar (tooth #38), which was partially erupted. The tumor exhibited ulceration on its surface, with predominant erythematous coloration (Figure 1).

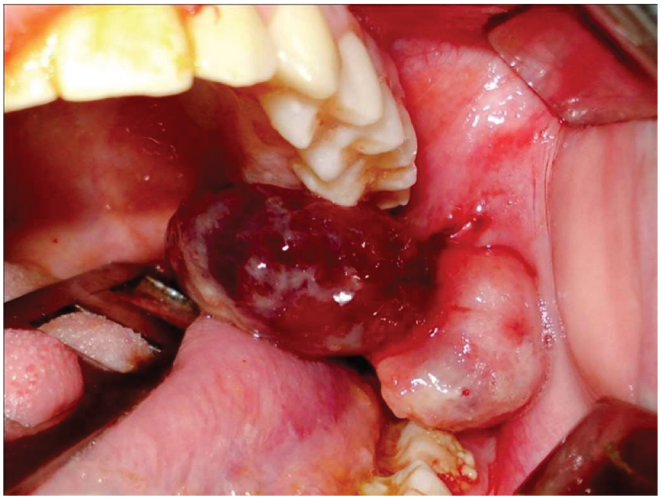

Figure 1. Clinical features of the lesion. IMT exhibiting ulcerated surface.

The patient reported that the time of onset and progression of the lesion was three weeks. An incisional biopsy was performed under local anesthesia and the histopathological histopathological analysis revealed a benign mesenchymal tumor represented by an oral mucosa with extensive ulceration.

Spindle cell proliferation with solid pattern, arrangement storiform and focal areas of collagenization were found in the lamina propria. The cells had a large and vesicular nucleus with evident nucleoli (Figure 2 A-D). To clarify the nature of the spindle cells an immunohistochemical panel was performed including: vimentin, desmin, S100 protein (S100), smooth muscle actin (SMA), cluster of differentiation 68 (CD68), cluster of differentiation 34 (CD34) and muscle specific actin (HHF-35). Cells were positive for vimentin as well as SMA and HHF-35 (Figure 3).

The results of histopathological and immunohistochemical analyses were consistent with the diagnosis of IMT. The lesion was removed together with the mandibular third molar and bleeding was controlled with electrocautery and suture. The complete healing of the region was achieved in two weeks. The patient is in follow up for five years without signs of recurrence.

In the review of the English-language literature 176 papers were identified including the terms "inflammatory myofibroblastic tumor" [title/abstract], or "plasma cell granuloma" [title/abstract], or pseudotumor [title/

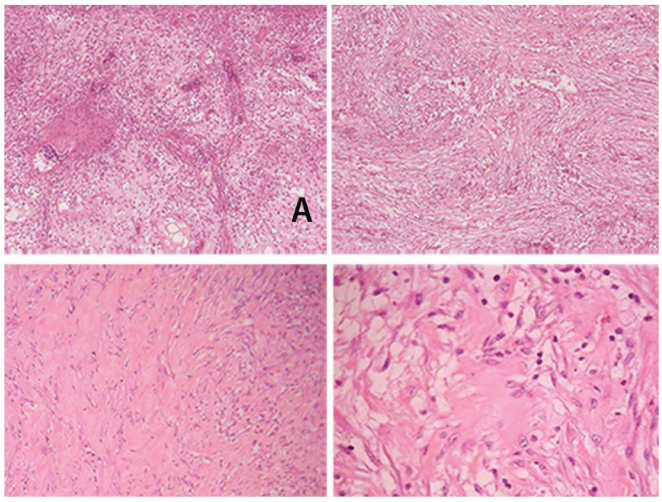

Figure 2. Histopathological features. Ulcerative appearance and myxoid profile of the IMT, H&E, 4X (A). IMT showing fusocellular (B) and collagenized (C) aspect, H&E, 4X Two different types of cells compose the IMT: rounded and fusocellular cells, H&E, 40X (D).

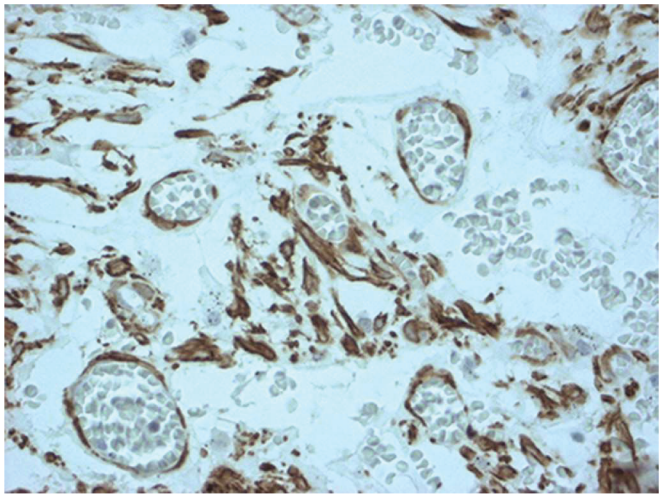

Figure 3. Immunohistochemistry. Positive cell to SMA, immunoperoxidase 40X.

abstract] and "mouth" [title/abstract], or "oral cavity" [title/abstract], or "oral mucosa" [title/abstract], or "mandible" [title/abstract], or "maxilla" [title/abstract] and 33 case studies in mouth were included in our review. Gingival site (maxilla and mandible) was the most common (13 cases). On the other hand, only one case occurred in retromolar region further this current case (Table 1).

DISCUSSION

The IMT, when located in head and neck is more common in children and young adults with male predominance[8]. In the present case the patient was also a young adult, but female. The appearance of the current case was polypoid with one lobule predominantly erythematous and the other similar to the oral mucosa. The surface was red and focally ulcerated. These features are consistent with other cases related on literature[9].

Although IMT can occurs anywhere in the body, the involvement of the mouth is rare[7,9,41]. In the review of literature, we found 6 cases in mandible and just one in the retromolar region further this current case[42]. IMT could show fast growth with no significant symptoms similarly with the case reported[43]. Microscopically, the tumoral architecture revealed an arrangement of the myofibroblastic cells and adense inflammatory component. Immunohistochemistry analyzes identified mesenchymal cells, specifically myofibroblastic cells. The cells were positive to SMA and HHF-35 revealing the muscular nature of the spindle cells[44].

Despite this benign morphological nature, the biological behavior of IMT ranges from completely benign to weakly malignant lesions. Cases with fast, aggressive growth have been reported. Aggressive growth potential and recurrent malignant transformation are correlated with a high degree of atypia, and an increased number of mitotic figures, multi-nodularity, DNA aneuploidy, a high proliferative index and high expression of oncogenic proteins[7,43].

Given this condition, the histopathology is very important in the diagnosis. Myofibroma of the gingiva shows similar histopathological features of IMT but immunohistochemical analyses reveal difference: positive cells just for vimentin and SMA. Despite the morphological nature, the tumor is apparently benign, some cases have been reported with fast and aggressive local growth.

25% of all IMT have relapse and 5% have metastasis[7]. From 15% to 30 % of cases of IMT are accompanied by fever, hypochromic microcytic anemia, thrombocytosis, high value hemosedimentation and hypergammaglobulinemia but when treated, symptoms disappear[3].

Being a fibrohistiocytic lesion the differential histological diagnosis should include other similar injuries, such as: non-neoplastic proliferative lesions (peripheral giant cell lesion, pyogenic granuloma, nodular fasciitis, fibromatosis and inflammatory histiocytoma) and malignancies of mesenchymal origin, malignant fibrous histiocytoma, fibrosarcoma and leiomyosarcoma[4].

Complete surgical excision of the tumor has proven to be the only effective treatment[4]. Recurrence may reflect inadequate resection of the lesion or a tumor that closely

Table 1. Features of 34 oral maxillofacial IMT cases already reported.

Author (year)	Age	Sex	Site	Treatment	Follow-up
			Intraosseous		
Poh C et al.[10] (2005)	42	Female	Posterior mandibular	Enucleation	20 months - recurrence in 14 months
Oh J et al.[11] (2008)	20	Female	Posterior mandible	Mandibulectomy	22 months - no recurrence
Ono K et al.[12] (2012)	65	Male	Posterior maxilla	Enucleation	7 months - no recurrence
Gallego L et al.[13] (2013)	53	Female	Anterior maxilla	Enucleation	20 months - no recurrence
Rautava J et al.[14] (2013)	11	Female	Anterior maxilla	Enucleation	36 months - no recurrence
Gutiérrez Santamaría J et al.[15] (2014)	39	Male	Posterior mandible	Steroid therapy	Not described
Stringer D et al.[16] (2014)	16	Male	Posterior mandible	Enucleation	6 months - no recurrence
Adachi M et al.[17] (2015)	42	Male	Posterior mandible	Removed en bloc	12 months - no recurrence
			Peripheral		
Shek et al.[18] (1996)	36	Female	Gingiva posterior maxilla	Excision	13 months - no recurrence
Ide F et al.[19] (1998)	68	Female	Buccal mucosa	Excision	Not described
Ide F et al.[42] (1998)	43	Female	Retromolar region	Excision	12 months - no recurrence
Ide F et al.[20] (2000)	27	Male	Tongue	Excision	Not described
Cable B et al.[21] (2000)	29	Female	Hard palate	Excision	Not described
Brooks J et al.[22] (2005)	82	Female	Gingiva posterior mandible	Excision	18 months - no recurrence
Gleizal A et al.[23] (2007)	22	Female	Tongue	Excision	169 months - recurrence in 1 month
Johann A et al.[24] (2008)	33	Male	Gingiva posterior mandible	Excision	28 months - no recurrence
Xavier F et al.[25] (2009)	23	Female	Floor of the mouth	Excision	24 months - no recurrence
Eley K & Watt-Smith[26] (2010)	29	Male	Gingiva posterior maxila	Excision	72 months - no recurrence
Satomi T et al.[9] (2010)	14	Female	Gingiva posterior mandilble	Excision	120 months - no recurrence
Phadnaik & Attar[27] (2010)	54	Female	Gingiva anterior mandible	Excision	8 months - no recurrence
Binmadi N[28] et al. (2011)	40	Female	Gingiva anterior maxila	Excision	4 months - no recurrence
Manohar & Bhuvaneshwari[29] (2011)	42	Female	Gingiva anterior maxila	Excision	Not described
Palaskar S[30] et al. (2011)	19	Male	Gingiva posterior mandible	Excision	6 months - no recurrence
Date A et al.[31] (2012)	70	Male	Buccal mucosa	Excision	12 months - no recurrence
Lourenço S et al.[32] (2012)	14	Male	Tongue	Excision	5 months - no recurrence
Gawande P et al.[33] (2012)	20	Male	Vestibule	Excision	18 months - no recurrence
Sabarinath B et al.[34] (2012)	55	Female	Lip	Exsicion	No follow up
Pandav A et al.[35] (2012)	58	Female	Gingiva anterior maxila	Excision	6 months - no recurrence
Sah P et al.[36] (2013)	30	Male	Gingiva posterior mandible	Steroid therapy	7 months - no recurrence
Lazaridou M et al.[37] (2014)	75	Female	Buccal mucosa	Hemimaxillectomy	12 months - no recurrence
Vishnudas B et al.[38] (2014)	54	Female	Gingiva anterior maxila	Excision	5 months - no recurrence
Rahman T et al.[39] (2014)	36	Female	Gingiva anterior and posterior maxilla	Excision	18 months - no recurrence
Jeyaraj P et al.[40] (2015)	56	Male	Gingiva anterior maxila	Excision	4 months - no recurrence
De Souza et al. (2017)	21	Female	Retromolar region	Excision	60 months - no recurrence
	Range 11-82 y.o. (39.35 y.o.)	Rate 1.6:1 Female(21) Male (13)	Intraosseous (8): Posterior mandible (6); anterior maxila (2) Peripheral (25): Gingiva (14); Buccal mucosa (3); Tongue (3); Retromolar region (2); Hard palate (1); Vestibule (1); Lip (1); Floor (1)	Intraosseous (8): Enucleation (5); Mandibulectomy (1); Steroid therapy (1); Removed en bloc (1) Peripheral (25): Excision (24); Steroid therapy (1); Hemimaxillectomy (1)	Range 6- 18 months (mean 26.57 months), 2 cases with recurrence (6%)

behaves like a myofibroblastic sarcoma. The difficulty in the total excision of the tumor in most cases is related to its size, with proximity to numerous important structures in the head and neck region[7].

In summary, IMT is a rare pathology, especially in the oral cavity, due to some features of clinical, IMT can be misdiagnosed as a malignant tumor and therefore the histopathological investigation must be meticulous and careful. The presence of homogeneity of the population of spindle shaped cells and absence of atypical mitosis in these lesions should be differentiated from low grade sarcomas. Recognition of the specific characteristics of IMT leads to the correct diagnosis, avoiding a more aggressive surgical treatment. However, given the variable biological behavior of these tumors, postoperative follow-up is very important.

HIGHLIGHTS

- IMT occurrence in the oral cavity is rare.
- We reported the second case of oral IMT in retromolar region.
- Literature review of oral IMT can help clinical, histopathological and behavioural aspects

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

ETHICAL APPROVAL

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent was obtained from the individual participant included in the study.

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