Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology xxx (2016) xxx–xxx

Contents lists available at ScienceDirect

Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology

journal homepage: www.elsevier.com/locate/jomsmp

Case Report

Oral intravascular papillary endothelial hyperplasia: Case report and review of literature

Mayara Santos de Castro[a], Marina Lara de Carli[b], Fernanda Salgueiredo Giudice[c], Suzana Cantanhede Orsini Machado de Sousa[d], Alessandro Antônio Costa Pereira[e], João Adolfo Costa Hanemann[f], Felipe Fornias Sperandio[g,*]

[a] School of Dentistry, Federal University of Alfenas, 700 Gabriel Monteiro da Silva Street, Alfenas 37130000, MG, Brazil
[b] Department of Clinic and Surgery, School of Dentistry, Federal University of Alfenas, 700 Gabriel Monteiro da Silva Street, Alfenas 37130000, MG, Brazil
[c] A. C. Camargo Cancer Center, National Institute of Oncogenomics and National Institute of Translational Neurosciences, São Paulo 01508010, SP, Brazil
[d] Department of Oral Pathology, School of Dentistry, University of São Paulo, São Paulo 05508-000, SP, Brazil
[e] Department of Pathology, Institute of Biomedical Sciences, Federal University of Alfenas, 700 Gabriel Monteiro da Silva Street, Alfenas 37130000, MG, Brazil
[f] Department of Clinic and Surgery, School of Dentistry, Federal University of Alfenas, 700 Gabriel Monteiro da Silva Street, Alfenas 37130000, MG, Brazil
[g] Department of Pathology, Institute of Biomedical Sciences, Federal University of Alfenas, 700 Gabriel Monteiro da Silva Street, Alfenas 37130000, MG, Brazil

ARTICLE INFO

Article history:
Received 23 June 2016
Received in revised form 27 July 2016
Accepted 2 August 2016
Available online xxx

Keywords:
Intravascular papillary endothelial hyperplasia
Mouth mucosa
Differential diagnosis
Histopathology
Immunohistochemistry

ABSTRACT

Intravascular papillary endothelial hyperplasia (IPEH) is an uncommon benign vascular lesion that comprises a reactive proliferation of endothelial cells arising from a consolidating thrombus. Oral presentations of IPEH are relatively rare, and when they do occur the most common affected site is the lower lip; in addition, IPEH can be mistaken for an angiosarcoma. This present report aims to describe an IPEH affecting the buccal mucosa, besides exposing 20 other cases of IPEH that were published over the past 40 years and that occurred within this same oral location. A literature review of those lesions along all other cases of oral IPEH was performed and took into consideration several aspects of the lesions, including their immunohistochemical profiles. The present case was diagnosed as IPEH due to characteristic histopathological findings and immunohistochemical reactions for CD34 and vimentin, which revealed strong positivity in the lining endothelial cells and confirmed the vascular origin of the lesion. Additionally, a positive reaction for laminin was observed in the basal membrane of the vessel walls. Low positivity for Ki-67 and an unexpected though interesting immunopositivity for GLUT-1 was observed. We emphasize that knowing the clinical characteristics, the specific histological arrangement and the immunophenotype of IPEH is extremely important for establishing the correct diagnosis and treatment among similar lesions.

1. Introduction

Back in 1923, Masson [1] described an uncommon benign vascular lesion composed of an excessive proliferation of endothelial cells in blood vessels. Masson named this lesion 'vegetant intravascular hemangioendothelioma', and subsequently other authors referred to the same entity using different names like "L'endovasculite proliferante thrombopoietique" [2], intravascular angiomatosis [3], intravascular endothelial proliferation [4], Masson's tumor [5], Masson's lesion [6], Masson's pseudoangiosarcoma [7] and Masson's hemangioma [8]; however, the term intravascular papillary endothelial hyperplasia (IPEH) is currently the most illustrative, least puzzling and the most frequently used in the literature [9,10].

Although IPEH's etiology remains uncertain, it has recently been suggested that it consists of a reactive lesion in response to inflammation and stasis; accordingly, at an ultrastructural level, IPEH closely resembles the granulation tissue, which supports the theory that it develops as a reparative process [11]. IPEH may occur in any blood vessel, particularly of the head and neck, fingers and

☆ AsianAOMS: Asian Association of Oral and Maxillofacial Surgeons; ASOMP: Asian Society of Oral and Maxillofacial Pathology; JSOP: Japanese Society of Oral Pathology; JSOMS: Japanese Society of Oral and Maxillofacial Surgeons; JSOM: Japanese Society of Oral Medicine; JAMI: Japanese Academy of Maxillofacial Implants.

* Corresponding author.
E-mail addresses: maya.castro@outlook.com (M.S. de Castro), marinadentista@gmail.com (M.L. de Carli), fernandagiudice@yahoo.com.br (F.S. Giudice), scmsouza@usp.br (S.C.O.M. de Sousa), alessandro.unifal@uol.com.br (A.A.C. Pereira), jachanemann@uol.com.br (J.A.C. Hanemann), felipe.fornias@unifal-mg.edu.br (F.F. Sperandio).

http://dx.doi.org/10.1016/j.ajoms.2016.08.001
2212-5558/

trunk; however, the incidence of IPEH in the oral cavity is relatively rare [12,13].

Clinically, IPEH presents as a firm and sometimes tender nodule or mass of reddish-blue coloration, with slight elevation and slow growth [14]. The histopathological examination reveals a reactive proliferation of endothelial cells organized in minor papillary assemblies with hypocellular and hyalinized centers and arising from an organized thrombus [15]. Hashimoto et al. [16] described three forms of IPEH: pure (arising from a dilated vascular space), mixed (occurs within the preexisting vascular lesion) and extravascular (appears within hematomas).

In general, CD31 and CD34 are the recommended markers for vascular lesions; and accordingly, IPEH cases are strongly positive for CD31 and CD34 [17]. Vimentin and laminin immunolabelling are also consistent with a vascular origin [15,18,19]. Moreover, in order to verify the proliferative potential of the lesions, Ki-67 antibody is often used [13,15,19]. Besides those traditional markers, GLUT-1 was also indicated as having a complimentary role in the diagnosis of IPEH [15].

The appropriate treatment for IPEH is the simple total excision with healthy margins and the prognosis is excellent, as recurrences are rare but may occur when the lesion is incompletely excised [20]. Here we report a case of IPEH in the buccal mucosa and emphasize the clinical, histopathological, immunohistochemical, therapeutic and prognostic aspects of such lesion. We also reviewed the pertinent literature available in the past 40 years in order to identify the main diagnostic features of oral IPEH.

2. Case report

A 53-year-old white male patient presented an asymptomatic lesion in the buccal mucosa, reporting 2-months of duration and thus, slow growth. The extraoral physical examination did not reveal any significant change, and intraorally there was a submucosal nodule covered by intact mucosa, purplish, with a firm consistency and located at the right buccal mucosa near the labial comissure, measuring approximately 1 cm in diameter (Fig. 1A). Based on these clinical aspects, the diagnostic hypotheses were hemangioma, mucocele and benign mesenchymal neoplasm. Needle aspiration yielded neither blood nor any other fluid. An excisional biopsy was then performed under local anesthesia. The specimen was sent fixed in formalin and embedded in paraffin. Hematoxylin and eosin-stained 5-μm-thick sections from the tissue block were made. Microscopic examination revealed a fragment of oral mucosa lined by stratified squamous epithelium; the lamina propria showed an intravascular proliferation of elongated fusiform cells, sometimes forming papillary structures toward the vessel lumen (Fig. 2A and B). In order to establish a more accurate diagnosis, immunohistochemical reactions were also performed. For this, 3-μm-thick sections were made from the same formalin-fixed, paraffin-embedded tissue, and then mounted on silanized slides, deparaffinized, and rehydrated. Sections were submitted to water bath antigen retrieval step and immersed in 10 mM citrate solution (pH 6.0) (CD34, vimentin, laminin and GLUT-1) or EDTA (pH 9.0) (Ki-67). Endogenous peroxidase activity was blocked with incubation for 30 min at room temperature in 6% H_2O_2 and methanol solution (v/v). Sections were rinsed with water and incubated for 15 min in Tris-buffered saline (pH 7.4). Then, we exposed the sections to the following primary antibodies: CD34 (1:50, DakoCytomation, Carpinteria, CA, USA), laminin (1:3000, Sigma, St. Louis, MO, USA), vimentin (1:800, DakoCytomation), Ki-67 (1:75, DakoCytomation) and GLUT-1 (1:200, DakoCytomation, Carpinteria, CA, USA) for 30 min, followed by incubation with biotinylated swine-anti-mouse, rabbit, goat antibody (LSAB + system-HRP K0690, DakoCytomation) and with streptavidin-biotin peroxidase conjugate (LSAB + System-HRP K0690, DakoCytomation), both for 30 min. After the addition of a buffered diaminobenzidine substrate (liquid DAB + substrate chromogen system K3468, DakoCytomation) for 10 min, antibody complexes were revealed. Sections were then counterstained with Mayer's hematoxylin for 10 min, dehydrated in ethanol, cleared with xylene, and mounted in xylene-based Permount (Fisher Scientific, Fair Lawn, NJ, USA). The immunohistochemical staining was performed in an autostainer (DakoCytomation) using Tris-buffered saline Tween-20 as buffer. Positive and negative controls were present in all reactions. Immunohistochemical analysis revealed a strong positivity in the lining endothelial cells for CD34 and vimentin, confirming the vascular origin of the lesion (Fig. 2C and D). Additionally, a positive reaction for laminin was observed in the basement membrane of the vessel wall (Fig. 2E). Ki-67 antibody labeled mildly the cell component of the lesion (Fig. 2F) and GLUT-1 was positive (Fig. 2G). Thus, the diagnosis of IPEH was established by the histological and immunohistochemical characteristics. One month after surgery, there was complete healing of the operated area (Fig. 1B), and to date there are no signs of recurrence.

3. Discussion

Although vascular lesions are relatively common within the oral cavity, IPEH rarely occurs in this region. A histological review of 103 cases of vascular malformations of the oral cavity revealed only 6 cases of IPEH (5.82%) [12]. Another similar study reported only 9 cases of IPEH (11.54%) out of 78 vascular lesions [13]. This present review identified the published articles around oral IPEH by searching through online databases (PUBMED/MEDLINE) and using the keywords: intravascular papillary endothelial hyperplasia; vegetant intravascular haemangioendothelioma; L'endovasculite proliferante thrombopoietique; intravascular angiomatosis; Masson's tumor; Masson's lesion and Masson's pseudoangiosarcoma. The criteria for inclusion were a confirmed histopathological diagnosis of IPEH and an oral location. Cases involving the oral cavity were identified (total of 132 cases) from 45 papers published from 1976 to June 2016. The clinical; histopathological and immunohistochemical aspects and follow-up of these cases are synthesized in Table 1.

The most affected oral locations of IPEH were: lower lip (48 cases; 36.36%), tongue (23 cases; 17.42%), buccal mucosa (20 cases; 15.15%) and upper lip (17 cases; 12.88%). Similar results about the site predilection of IPEH were demonstrated by Corio et al. [21], Buchner et al. [22] and Tosios et al. [23]. We report herein an additional case of IPEH in the buccal mucosa and affecting the male gender, although predilection for females is a reality [21–26]. Actually, reviewing the cases that do inform the patient's gender we found that 55% consists of women. The age of patients varies from 9 months [27] to 79 years [28], and the case reported here falls in between this range.

IPEH usually manifests as a firm nodule [5] or mass [8] with possible tenderness and reddish-blue color. The typical signs and symptoms are nonspecific and depend primarily on the anatomic location of the lesion. In addition, an accurate diagnosis of IPEH is challenging, as it is difficult to differentiate it from neoplastic and vascular lesions if only clinical findings are considered [29]. The differential diagnosis of IPEH relates to reactive lesions, neoplastic lesions and infectious origin. Specifically, the differential diagnosis of IPEH lesions in the buccal mucosa includes: lesions of minor salivary gland origin (benign vs. malignant salivary gland tumors, mucocele), hematomas, non-odontogenic soft-tissue infection, vascular origin (hemangioma), an intramasseteric abscess, masseteric hypertrophy, reactive and neoplastic neural lesions (traumatic neuroma, neurofibroma, neurilemoma) and benign

Please cite this article in press as: de Castro MS, et al. Oral intravascular papillary endothelial hyperplasia: Case report and review of literature. J Oral Maxillofac Surg Med Pathol (2016), http://dx.doi.org/10.1016/j.ajoms.2016.08.001