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Case Report

Hyaline ring granuloma of vegetable: Report of two cases with histochemical and immunohistochemical study

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ABSTRACT

Background: Peripheral hyaline ring granuloma is a rare lesion characterized by the presence of hyaline rings and multinucleated giant cells. Its pathogenesis is related to exogenous factors such as vegetal origin, resulting in foreign body reaction mediated by macrophages against cellulose particles. We report two cases: a 58-year-old male with a lesion in the maxillary alveolar mucosa measuring 1.0 cm × 1.0 cm; and a 50-year-old female presenting a slight swelling in the alveolar mucosa, measuring 0.7 cm × 0.7 cm and diagnosed as asymptomatic sessile nodule of fibrous consistency. Microscopic examination revealed a dense connective tissue with focal area of concentric hyaline collagen deposition and multinucleated giant cell granulomas of foreign body type. Immunohistochemical study was positive for anti-CD68/anti-α-SMA, confirming the foreign body reaction and vascular integrity. Histochemical analysis for PAS with and without diastase and van Gieson highlighted the vegetable exogenous origin of foreign material. Additionally, we performed a review of 7 cases published in the literature in the last 10 years.

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1. Introduction

Hyaline ring granulomas (HRGs) were first described in 1971 [1] as a lesion commonly related to the alveolar ridge mediated by a granulomatous reaction of giant cells, resulting in the formation and deposition of ring-like hyaline material [2].

HRGs were originally reported as chronic periostitis, but other designations have been given over the years, depending on their location and their supposed etiology, such as: giant cell hyaline angiopathy, pulse granuloma, granulation tissue with giant cells and hyaline change, food granuloma of the jaws and oral vegetable granuloma [2,3].

There are diverse theories about the pathogenesis of HRGs, with special attention to the endogenous and exogenous theories [2–5]. The endogenous theory proposes that the hyaline rings are the result of blood vessels degeneration or excess of proteinaceous material [6,7]; whereas the exogenous theory suggests that hyaline structures result from an inflammatory reaction against the implantation of foreign bodies in tissue, mostly vegetable particles [6–10].

Manjunatha et al. [5] reported that the structures are usually seen in periapical regions or in ridges and can be classified as peripheral or central lesions based on their location. The central lesions are asymptomatic, whereas the peripheral ones show an increase in volume in the submucosa regions.

There are histopathological reviews and descriptions of HRGs in the literature; however, the nature of this lesion still needs more clarification. This study aims to present two cases of peripheral HRGs and to demonstrate the differentiation in what concerns the possible origin of this lesion through immunohistochemical analysis, with emphasis on the diagnostic criteria. In addition, we reviewed 7 cases of peripheral HRG reported in the literature over the past 10 years.

2. Case 1

A 58-year-old male sought the oral diagnostic service at the Federal University of Rio Grande do Norte (UFRN), complaining of a swelling in the gum. In the medical history, there were no systemic alterations, the lymph nodes were not palpable, and the extraoral examination was considered normal. The intraoral examination revealed a nodule lesion in the maxillary alveolar mucosa, in an edentulous area. The nodule was firm to the touch, of a fibrous consistency, sessile implantation and with exophytic growth. The lesion was asymptomatic measuring 1.0 cm × 1.0 cm. The patient did not report any type of trauma in the region.

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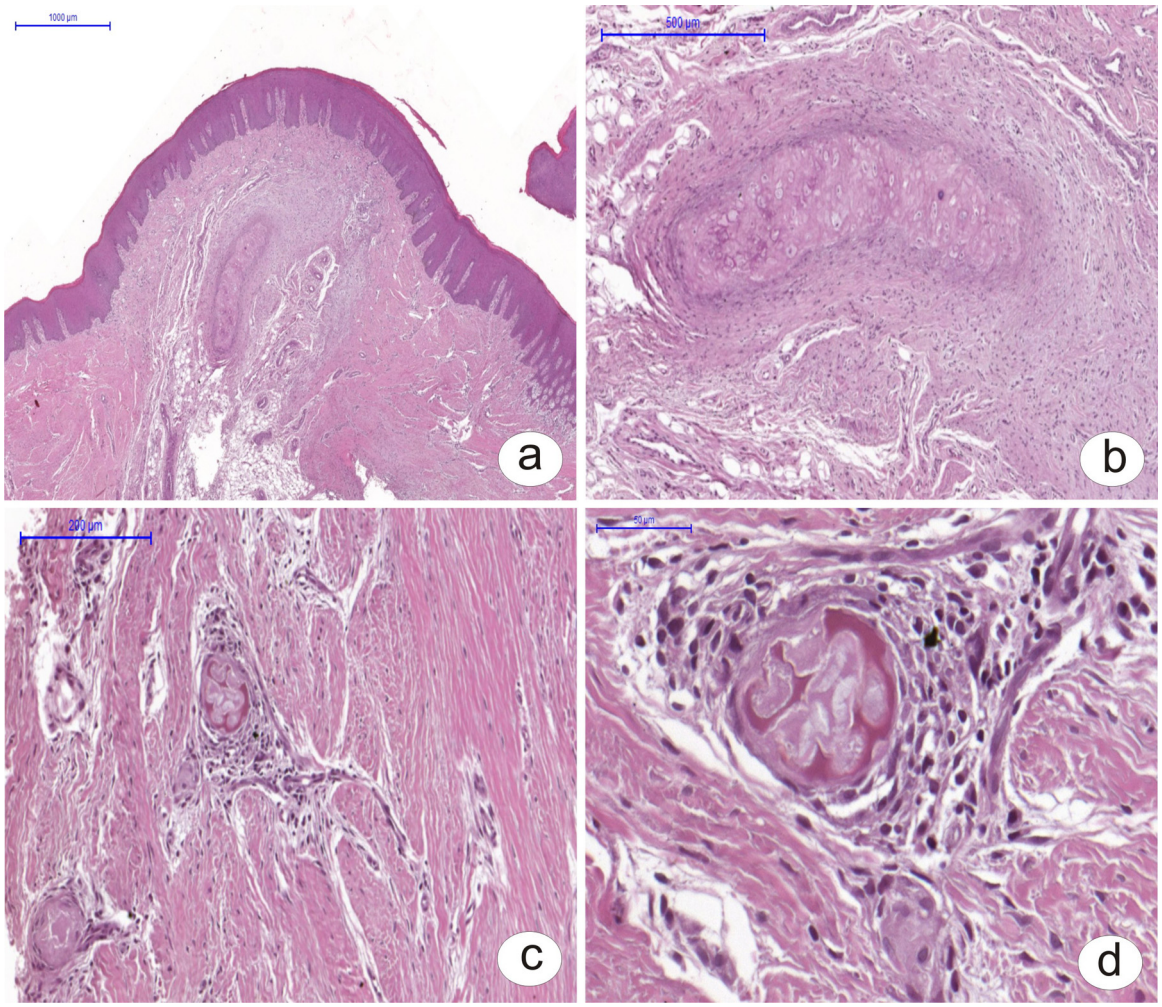

Fig. 1. (a) Low-power view revealing intact epithelium and a central area with concentric hyaline collagenization. (b) High-power view revealing HRG structure surrounded by thick fibrous connective tissue infiltrated by chronic inflammatory cells. (c) and (d) Higher magnification of characteristic formation of HRG and granulomatous reaction.

Clinical diagnosis was fibrous hyperplasia and an excisional biopsy was performed under local anesthesia. The material consisted of a soft tissue fragment of whitish color, with a slick surface, firm consistency and measuring 1.2 cm × 0.6 cm × 0.3 cm. Microscopic examination revealed an intact oral epithelial lining and a dense connective tissue, with a light chronic inflammatory infiltration adjacent to the epithelial surface. The most central region of the connective tissue exhibited a focal area of concentric hyaline collagenization with granulomas containing multinucleated giant cells and an associated foreign body. The reactive area contained a structure with cellularized eosinophilic material, suggesting vegetable deposits associated with hyaline rings and giant cells (Fig. 1a–d). Based on these histopathological findings, Oral Peripheral HRG was suggested for diagnosis.

3. Case 2

A 50-year-old female was referred to the oral health services of the Federal University of Rio Grande do Norte (UFRN) for examination of an oral lesion. The intraoral examination revealed the absence of dental elements in the area and the presence of a nodule lesion in the alveolar mucosa, with a fibrous consistency, sessile implantation and exophytic growth. The asymptomatic lesion measured approximately 0.7 cm × 0.4 cm × 0.3 cm. The patient reported trauma in the region provoked by the use of a poorly adapted prosthesis, which had been causing pain and had caused changes in mucosa for about 2 years.

Microscopic examination showed fragments of oral epithelial lining, chronic inflammatory infiltration in the lamina propria and focal areas of collagenization adjacent to the center of the specimen. The area of reaction contained cellularized eosinophylic material, suggestive of vegetable residue associated to hyaline rings and giant cells. Therefore, the histopathological diagnosis of Oral Peripheral HRG was suggested.

4. Immunohistochemical and histochemical analysis

An immunohistochemical analysis was carried out, and the giant cells in both cases showed positive reaction for the anti-CD68 (*PG-M1, Dako Corp., Carpenteria, CA, USA, 1:400*) (Fig. 2a–b), confirming the foreign body reaction mediated by macrophages. Vascular integrity was also tested by the immunohistochemical analysis, which revealed positivity for α-SMA (Clone 1A4, *Dako Corp., Carpenteria, CA, USA, 1:100*) in the blood vessel walls (Fig. 2c–d). Further, histochemical staining for PAS with and without diastase and van Gieson were performed to check the exogenous vegetable origin of the foreign body (Fig. 3a–c).

After histopathological, histochemical and immunohistochemical analysis, the diagnosis of oral peripheral HRG with suggestive exogenous etiology of vegetable origin was given for both cases.

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