

Focal giant cell lesion in the wall of a radicular cyst

Labros Goutzanis¹, Panagiota Economopoulou²

Abstract

A rare case of unilocular radiolucency associated with the apices of the left maxillary incisor and canine in a 32 years old female, is presented. Histologically, the lesion showed foci of giant cell lesion in the wall of radicular cyst; there was no evidence of hyperparathyroidism. The clinicopathological presentation is likely a histopathological curiosity and may be an example of “double” pathology / collision of apical inflammatory pathology and central giant cell lesion or reflect florid osteoclastic resorption. Indiscriminate use of the term “periapical central giant cell lesion (granuloma)” in histopathological diagnosis should be avoided.

¹ Department of Oral & Maxillofacial Surgery, School of Dentistry, National and Kapodistrian University of Athens, Athens, Greece

² Department of Oral Pathology & Medicine, School of Dentistry, National and Kapodistrian University of Athens, Athens, Greece

Corresponding Author:
Panagiota Economopoulou
6 Serron Str.
152 31, Halandri
Athens, Greece
Tel.: +30 2106716431
e-mail: peconomo@dent.uoa.gr

Introduction

A recent review of the pathology of unilocular radiolucencies associated with tooth apices, classified the range of inflammatory and other conditions accounting for the osteolysis therein, as well as the underlying pathological processes [1]. The range included the lobulated, cellular areas with histology similar to the giant cell lesion of jaws (central giant cell granuloma), which occur in conjunction with conventional apical inflammations [1]. Dahlkemper et al. are credited with drawing attention to this phenomenon [2] that is rare and not widely known. It was felt therefore that the report of an additional case together with an attempt at clarifying terminology and commenting on diagnostic, pathogenetic and clinical aspects would be of interest.

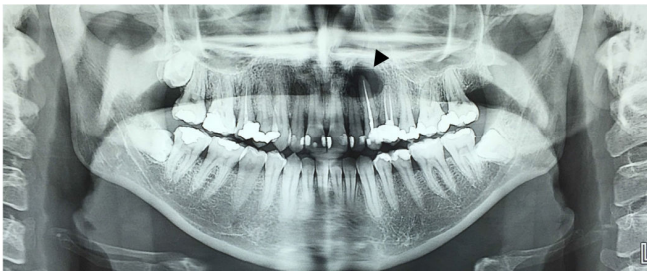


Figure 1: Imaging features of the lesion (arrowhead)

Case report

A 32 years old female was examined in January 2016 for pain in the area of the left maxillary anterior teeth. The medical history was unremarkable. On clinical examination, the left maxillary lateral incisor and canine were sensitive upon percussion. The submitted orthopantomograph showed a circumscribed, unilocular radiolucency surrounding the apices of these teeth; the canine had been subjected to root canal treatment (Figure 1). The lateral incisor was similarly treated and this was followed by

surgical exploration of the radiolucency, removal of contents and curetting of the bony cavity, apicoectomy of both teeth, and retrograde apical sealing of the canine. There were no post-operative complications.

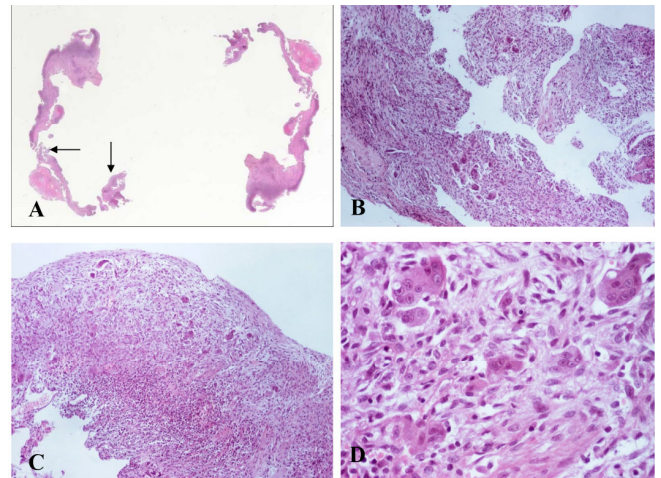


Figure 2: A shows scanned, haematoxylin and eosin stained sections to appreciate the cyst-like arrangement of the tissues; the cellular areas are arrowed.

B and C correspond with the areas indicated by the horizontal and vertical arrows in A, respectively; scattering of osteoclast-like multinuclear giant cells against a cellular background of mononuclear cells (objective magnification x 4.)

D shows an area of C at higher magnification; typical osteoclast-like multinuclear giant cells, two of which show cytoplasmic vacuoles; mononuclear cells and extravasated erythrocytes (lower left of the picture) are also seen (objective magnification x 20).

The removed specimen consisted of an opened soft sac, measured 20x8 mm; were fixed in 10% formalin and routinely processed for histological examination. The sections showed concave, variably and subacutely inflamed, fibrous connective tissue that included two ill-defined

cellular areas 2.1-2.7 mm in diameter (Figure 2A). Epithelial lining was not seen. The cellular areas showed the typical histology of central giant cell lesion [3] (Figures 2B,-D).

Levels of calcium, phosphorus, parathyroid hormone and alkaline phosphatase in serum, were within normal limits.

Comment

Despite the absence of epithelial lining, the fundamental pathology accounting for the present radiolucency should be interpreted as periapical, radicular cyst. This is supported by the size of the radiolucency, appreciated in Figure 1, gross pathology; and cyst-like arrangement of the tissues (Figure 2A). Absence of epithelial lining is not unusual in large, radicular cysts and attributable to destruction / widespread ulceration effected by the inflammatory infiltrate in their wall. The particular feature of the present case was the areas of histology similar to a central giant cell lesion [3]. The biochemical assays excluded hyperparathyroidism and allowed a histopathological characterisation of focal giant cell lesion in the wall of a radicular cyst.

The present authors avoided using the term “periapical central giant cell granuloma” [2] as diagnosis. This term has been indiscriminately applied in the literature for describing two groups of lesions. The first includes conventional giant cell lesions fortuitously surrounding apices of teeth rather than occurring in non-dentigerous areas of the jaws [4-9]. Topographical sub-classification of central giant cell lesions may satisfy publication needs [4-9], but is confusing. The second group features foci of giant cell lesion in radicular cysts, granulomas or abscesses [1,2], and includes 16 and 3 cases collected by Dahlkemper et al. [2] and Economopoulou &

Triantafyllou [1], respectively, and the present case. There appear to be no significant variations in demographic and clinical features between the two groups, though the average age is 11 years older in the second group [2]. While the limited sample may account for this difference [2], caution should be exerted and the uncertainty about pathogenesis (see below) should be considered. The present authors thus regard that the second group would be more appropriately characterised by the descriptive term “focal giant cell lesion in radicular inflammatory process”.

Regarding the pathogenesis of focal giant cell lesion in radicular, inflammatory processes two hypotheses are considering. The first interprets the foci as fortuitous co-occurrence of cysts, granulomas, etc [1] and early central giant cell lesion. The characterisation “early” is supported by previous publications suggesting the small size of the foci [1, 2], though precise measurements, as here, are lacking. Co-occurrence of giant cell lesion and odontogenic fibroma is also arised in jaws [10]. The second hypothesis regards the foci as vigorous osteoclastic resorption at the periphery of the inflammatory processes. It corresponds with small size of the foci, and with collections of osteoclast-like multinuclear giant cells, which may be seen in other odontogenic lesions (see Economopoulou & Hatzimanolis [10] for references). The rarity of the foci, seen in 0.09% of radicular cysts and granulomas [2], can comprise both hypotheses. As in the present case, root canal treatment was a feature in most of the cases (87%) collected by Dahlkemper et al. [2]. An aetiological relationship is, however, unlikely.

Aetio-pathogenetic speculations apart and with the proviso that hyperparathyroidism is excluded it is likely that foci of giant cell lesion in radicular inflammatory processes are a histopathological curiosity of little clinical significance. From diagnostic purposes, head and neck pathologists

should be aware of this rare phenomenon and encouraged to endorse the terminology suggested above; overdiagnosis may otherwise result and lead to further, unnecessary, surgical

manipulations. In addition, the histopathology report should advise the exclusion of endocrinopathy.

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