Case Report

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SMP Journal of Dentistry

Dental Follicle

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Publication Dates

Received date: January 11, 2022

Accepted date: February 11, 2023

Published date: February 14, 2023

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Citation

Irulandy Ponniah (2023) Dental follicle. SMP J of Dent 1: 1-5

Abstract

Dental follicle is a composite of dense and loose fibrous connective tissue of neural crest origin. It forms the outer covering of tooth germ and is capable of differentiation along specialized lineage of mesenchymal cells contributing to forming of supporting tissue and aids in tooth eruption. The present report illustrates the presence of nerve fibers in dental follicle in a 13-year-old male presented with an impacted left mandibular canine, which has the potential for misinterpretation as odontogenic myxoma.

Key Words: Dental; Follicle, Tooth; Germ; Odontogenic; Nerve

Introduction

The dental follicle (DF) is a neural crest derived organized network of dense fibrocollagenous and loosely organized vascular connective tissue juxtaposed between tooth and its supporting tissues during development [1]. After crown stage of tooth development, the coronal part of the DF is invested by residual epithelium or reduced enamel epithelium of the enamel organ while DF singly forms the outer most layer elsewhere. The DF is involved in tooth eruption during the intraosseous phase and its heterogenous cell populations differentiates along cementoblasts, fibroblasts and osteoblasts to contribute cementum, periodontal ligament and alveolar bone. In addition, DF is also capable of neuronal and adipocyte differentiation [2]. The present report illustrates the presence of nerve fibers in dental follicle in a 13-year-old male presented with an impacted left mandibular canine.

Case Report

An apparently healthy boy aged 13-years presented with an impacted left mandibular canine tooth (Figure 1A), which was detected on routine radiography during orthodontic treatment. His past medical or dental history was not significant. The panoramic radiograph revealed an impacted left mandibular canine surrounded by an enlarged follicular space (Figure 1B). The impacted canine was surgically removed along with the follicular soft tissue, which was submitted for histopathological evaluation. Microscopic examination showed a fibromyxoid connective tissue stroma with pauci-cellular bland stellate to spindle cells admixed with numerous nerve fascicles that lacked organization into perineurium and epineurium. In addition, odontogenic epithelial cells with clear cytoplasm, basophilic calcification and adipocytes were observed (Figure 2A-C). S100 immunohistochemistry marked the nerve fibers and adipocytes (Figure 2D & E).

Discussion

DF appears on radiograph as a thin, semi-circular radiolucency around unerupted or impacted teeth [3]. On occasion, it may appear as an enlarged follicle either involving single tooth or multiple teeth in any tooth series of both jaws, although it is often found in association with maxillary and mandibular third molars [3,4]. Radiographically, DF appear as a thin, semi-circular radiolucency around unerupted or impacted teeth,[3] which may simulate other incipient pericoronal pathologies such as dentigerous cyst, especially when the size is less than 3 mm in width. On occasion, it may appear as an enlarged follicle either involving single tooth or multiple teeth in any tooth series of both jaws [3]. The appellation single or multiple is used depending on the number of associated teeth while the appellation calcifying denotes microscopic evidence of mineralized materials [5]. It is believed that DF may eventually become odontogenic fibroma and thence odontogenic myxoma [6].

Figure 1: Panoramic radiograph shows an impacted left mandibular canine and an enlarged pericoronal radiolucency in A, and surgical appearance of the lesion in B

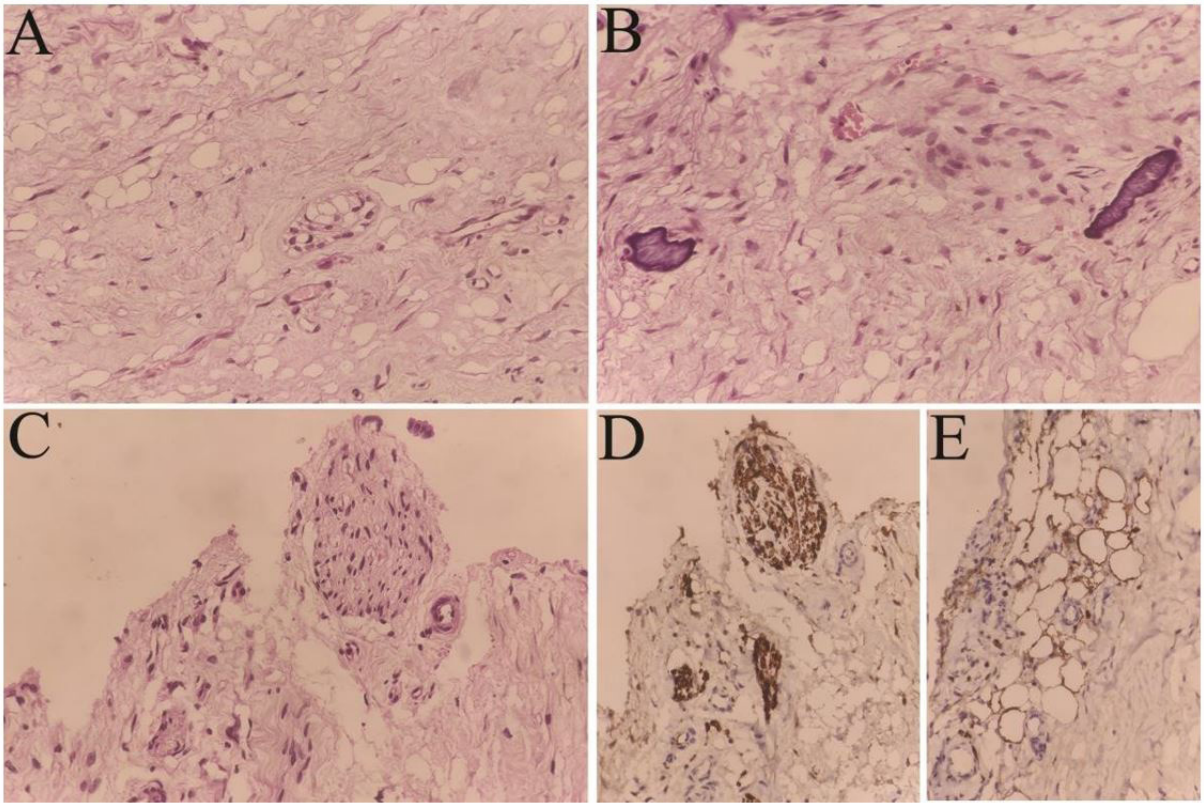

Figure 2: A – C, shows a routine H & E section with pauci-cellular fibromyxoid stroma with scattered adipocytes and an epithelial nest (arrow) in A, calcified structure (arrow) in B, and nerve fibers (arrow) in C. The nerve fibers and adipocytes exhibit positive reaction with S100 in D and E, x400

Microscopically, DF is defined as a composite of dense fibrocollagenous and loose, vascularized connective tissue,[1] but in pathological states it appears fibrous to myxoid tissue in which small odontogenic epithelial nests, with and without squamous metaplasia, and associated foci of calcification may be evident [3,4]. The calcification ranges from small acellular basophilic droplets or short, thin, needle-like surrounded by odontogenic epithelial cells and as woven bone/osteoid/cementoid. Rarely, the calcification appears as Liesegang ring-like [4]. Calcified material is invariably found in hyperplastic DF associated with multiple teeth while it is found in 40% of cases in association with single tooth [4]. Except for the degree of calcification, DF associated with single and multiple teeth do not differ,[4] although some reports of multiple DF are similar to odontogenic fibroma (WHO type) [7,8].

Microscopically, DF simulates DF of regional odontodysplasia and amelogenesis imperfecta, odontogenic myxoma and odontogenic fibroma [3,5]. In addition, in view of the presence of nerve fibers in the present case, benign nerve sheath tumor such as neurofibroma needs distinction [9]. Although inactive odontogenic epithelial rests can be found in both odontogenic myxoma and DF, myxoid stroma with sparse cellularity in conjunction with clinical expansion and destruction characterizes odontogenic myxoma [10]. Odontogenic fibroma (simple type) is indistinguishable from DF, [6] but the conspicuous presence of nests of odontogenic epithelial cells in the former tumor should aid in the differential [3,10]. Interestingly, a previous study reported the presence of nerve fibers in a case of central odontogenic fibroma [11]. However, unlike the present case, that lesion was found in relation to the apical part of anterior teeth [11]. Central neurofibroma has been reported to occur in association with DF of an impacted tooth, [9] which necessitates differentiation from the present lesion. Although nerve fibers are present within the tumor stroma of neurofibroma, the tumor mass is separated from the DF and exhibit interlacing fascicles of bundles of spindle cells with wavy nuclei [9]. Therefore, the presence of neural differentiation in a pauci-cellular myxoid background along with scattered inactive odontogenic rests is consistent with DF in the context of a pericoronal radiolucency. Although previous literature reported presence of nerve fibers in DF, no photomicrographs were shown to illustrate the nerve fibers [12].

In conclusion, a case of DF with histological presence of nerve fibers is illustrated to avoid misinterpretation as odontogenic myxoma.

The author declares no competing interest.

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