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# Chronic Periapical Periodontitis Containing Mature Human Hair Shaft: A Case Report

**Abstract:** A case is reported of a 44-year-old male who was referred with persistent pus discharge associated with his UL2 which had been root treated on two occasions. Radiographic examination revealed a radiolucency of approximately 8 mm diameter. An apicectomy was performed and histopathological examination revealed the presence of mature birefringent hair-shaft structures within a chronic periapical periodontitis.

**Clinical Relevance:** This article presents a rare occurrence, the presence of human hair in the periapical tissues.

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Periapical periodontitis refers to inflammation and destruction of periradicular and/or periapical tissues, the most common cause being endodontic infection resulting from pulpal necrosis. Other causes can be trauma or endodontic treatment.<sup>1,2</sup> A chronic periapical periodontitis may present as a discharging sinus, a tooth which is tender to percussion, or may be asymptomatic and discovered on routine clinical examination.<sup>3</sup> The associated tooth is non-vital.<sup>3,4</sup> Periapical radiolucencies are common and 90% are attributed to chronic periapical periodontitis or periapical cysts.<sup>4</sup> Table 1 gives a differential diagnosis of periapical radiolucencies.

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Radiographic appearances of chronic periapical periodontitis vary from slight widening of the periodontal ligament space to a well defined radiolucency. A condensing osteitis is often associated with the lesion owing to the formation of sclerotic bone in reaction to continued inflammation.<sup>3,10</sup> Radicular cysts (inflammatory dental cysts) are characterized as radiolucencies measuring greater than 1 cm in diameter and are a direct sequela of chronic periapical periodontitis.<sup>3</sup> A radiographic image can only lead to a provisional diagnosis and histological examination should be utilized to establish a definitive diagnosis.<sup>11</sup>

Typical histological features of periapical periodontitis include:

- Granulation tissue;
- A chronic inflammatory infiltrate, in which T-lymphocytes are likely to outnumber B-lymphocytes;
- Foamy macrophages;
- Cholesterol clefts;
- Multinucleate giant cells; and
- Deposits of haemosiderin, which are frequent findings;<sup>2,3,10</sup>
- Infiltrating neutrophils, which are also commonly seen.

Stimulation and proliferation of

the remnants of Hertwig's root sheath (cell rests of Malassez) is postulated to be the cause of periapical cyst formation.<sup>2</sup>

Conventional endodontics or extraction of the associated tooth is the treatment of choice in the first instance. However, should the lesion persist, enucleation of the lesion and an apicectomy of the causative tooth should be performed.<sup>2,3</sup>

## Case report

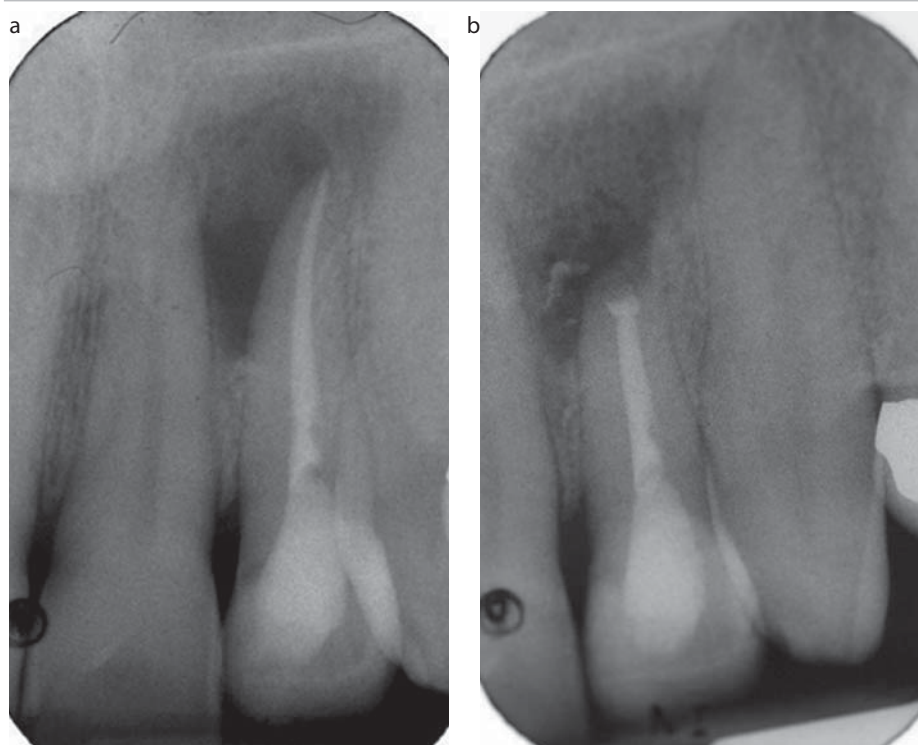
A 44-year-old male was referred by his general dental practitioner for the apicectomy of his upper left lateral incisor (UL2). The patient was concerned about persistent pus discharge associated with the UL2. This tooth had been root filled on two occasions previously, the most recent filling was performed three weeks prior to presentation. Clinical examination revealed a discharging sinus adjacent to the UL2. Radiographically, the current root filling appeared well condensed, however, a radiolucency of approximately 8 mm diameter was evident (Figure 1a).

The patient suffered from asthma which was well controlled. He was otherwise fit and well, a non-smoker

Inflammatory	Benign	Malignant
Acute periapical periodontitis/periapical abscess	<b>Cysts</b> Nasopalatine duct cyst, Solitary bone cyst, calcifying odontogenic cyst, odontogenic keratocyst	Metastatic disease (breast or lung)
Chronic apical periodontitis/periapical granuloma	<b>Tumours</b> *Calcifying epithelial odontogenic tumour (Pindborg tumour)	Lymphoma/leukaemia
Radicular cyst (inflammatory dental cyst)	Langerhans cell disease	Multiple myeloma
Periapical scar	Adenomatoid odontogenic tumour	
Actinomycosis	<b>Miscellaneous</b> *Periapical cemento-osseous dysplasia *Ossifying/cementifying fibroma Vascular malformation Central giant cell granuloma	

\*These lesions may have a mixed appearance (radiolucent and radio-opaque).

**Table 1.** A differential diagnosis of periapical radiolucencies.<sup>5-9</sup>



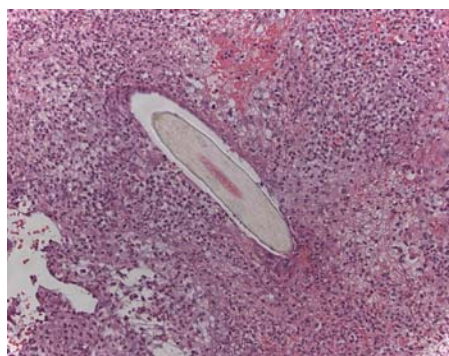
**Figure 1.** (a) Pre-operative periapical radiograph. (b) Periapical radiograph taken one year post-operatively.

and consumed approximately six units of alcohol per week.

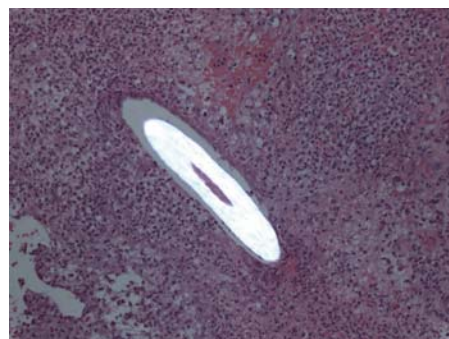
The UL2 was apicected under local anaesthesia. On examination of the lesion in the bony defect at the apex, hair like structures were visible, the defect was curetted and the tissue sent for histological examination. The root was subsequently prepared and a retrograde filling was placed using IRM (Intermediate Restorative Material, Dentsply, UK).

Histopathological examination revealed the presence of oedematous, haemorrhagic immature fibrous tissue diffusely infiltrated by neutrophils and plasma cells and containing mature birefringent hair-shaft structures (Figures 2 and 3). Multinucleate giant cells were identified but no epithelial lining was present. The surface was coated by bacterial plaques in places. The features were coincident with a chronic periapical periodontitis with verified mature human hair shaft.

A review radiograph taken one



**Figure 2.** A medium power photomicrograph of a field in the centre of the lesion demonstrating the structure in the middle that was verified as a hair shaft (haematoxylin and eosin, original magnification x 20).



**Figure 3.** Same field as Figure 2 viewed with polarized light clearly illustrating the hair shaft in the centre of the lesion (haematoxylin and eosin, original magnification x 20).

year post-apicectomy revealed that bony healing of the defect had commenced (Figure 1b).

## Discussion

To the best of the authors' knowledge, and after a thorough search of the literature, there are no previous reports of chronic periapical periodontitis containing histologically verified mature human hair shaft, confirming that this is an extremely rare occurrence. Other lesions that contain hair follicles are dermoid cysts<sup>12</sup> and teratomas, the former arising from the ectoderm and the latter containing all three germ layers. Dermoid cysts in the oral cavity are extremely rare, with only 1.6% of all dermoid cysts occurring in the mouth.<sup>13-15</sup> Oral dermoid cysts are mostly seen in the midline of the floor of the mouth and the hard palate,

but very rare cases have been reported where they occur in maxillary and the mandibular bone.<sup>16,17</sup>

## What could cause the presence of hair in a periapical lesion?

The lesion oral pulse granuloma (OPG) denotes a foreign body reaction to particles of vegetable foods, particularly leguminous seed such as peas, beans and lentils (pulses) that get lodged in the oral tissues.<sup>18</sup> Periapical pulse granulomas are associated with teeth with a history of endodontic therapy,<sup>19</sup> therefore it is possible and clinically relevant that a hair shaft can reach the periapical tissues via the root canal system, which may have been exposed to the oral cavity by either trauma, caries or endodontic procedures.

## Conclusion

The case describes a previously unreported lesion, the cause of which cannot be definitively identified using current knowledge and literature.

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