Case Presentation October 2013:

CBCT - To treat or not to treat

The use of cone beam CT imaging in the diagnosis of periapical lesions

The diagnosis of periradicular lesions with an ordinary periapical film or an OPG alone is sometimes problematic. Ordinary images will typically only show those lesions that have broken through at least one of the two cortical plates, yet processes completely contained in the spongiosa will rarely show up \(^1,2,3\). Furthermore, an ordinary film is merely a two-dimensional representation of a three-dimensional process, so that the presence of a lesion may be suggested, but in fact this may be an artefact created by various layers of superimposed structures.

The cone beam CT is a great tool in these cases, which offers additional information to arrive at the correct diagnosis. The following two cases are examples, where the additional information afforded by the cone beam CT has contributed substantially in making a decision whether to treat or not to treat.
Case 1:

**Patient:** 30 yo female, referred by her general dentist for assessment #47. A periapical radiolucency was found on routine radiographs.

**Medical Hx:** No relevant medical Hx

**Dental Hx:** Restoration #47, no discomfort, otherwise no relevant dental history

**Chief complaint:** “My dentist referred me for investigation of a finding on the radiograph”

**Objective findings:** Tooth #47 reacted normally to cold testing, palpation and percussion testing.

**Periodontal:** All probings 2 mm or less on #47

**Radiographic (PA):** Restoration present, periapical shadow, suspected C-shaped canal anatomy

(Fig.1)

A Cone beam CT was requested at this time. The CBCT-derived OPG gives the appearance of a periapical lesion, as expected. (Fig.2). The coronal (Fig.4) and axial (Fig.3) views of the suspected lesion reveal, that in this case the apex of the tooth #47 is curved to the lingual, perforating the lingual cortical plate.

**Discussion:** Pulp testing revealed a normally responsive pulp in this case, suggesting that root canal treatment may not be required.

The apex of tooth #47 perforates the lingual cortical plate (as normal anatomy) and is situated just above an indentation in the ramus of the mandible, thereby merely mimicking a periradicular lesion in the two-dimensional image.

**Assessment:**

- **Pulpal Diagnosis:** Normal
- **Periradicular diagnosis:** Normal
- **No treatment needed at this time**
Case 2:

Patient: 70 yo female, referred by her general dentist for assessment #35. A periapical radiolucency was found on routine radiographs.

Medical Hx: No relevant medical Hx

Dental Hx: Full crown restoration #35, no discomfort, otherwise no relevant dental history

Chief complaint: “My dentist referred me to find out if I may require root canal treatment on #35”

Objective findings: Tooth #35 reacted normally to cold testing, palpation and percussion testing.

Periodontal: All probings 3 mm or less on #35

Radiographic (PA): Restoration present, periapical shadow, PDL visible throughout the suspected lesion (Fig.5)

A Cone beam CT was requested. The CBCT-derived OPG gives the appearance of a periapical lesion, as expected (Fig.6). The axial view (Fig.7) of the suspected lesion reveals, that this lesion in fact is bilaterally symmetric.

Discussion: In this case the suspected lesion is merely the radiographic representation of the mental foramen. In the periapical film the lesion appears to track mesially. In fact the inferior alveolar nerve tends to track mesial to the second premolar and then loop backwards, prior to exiting the mandible, in many cases.

Of note is also that the unbroken PDL can be observed throughout the lesion in the periapical radiograph. This is often a sign that the suspected lesion and the apex of the tooth are in fact located in different planes, in a bucco-lingual direction, and may not be associated with one another.

Pulp testing revealed a normally responsive pulp in this case. Often however pulp testing will not yield a normal response in the case of sclerosed pulps and of large coronal restorations. In the absence of clinical symptoms, thorough diagnostic imaging may be helpful when making decision whether to treat or not to treat.

Assessment: Pulpal Diagnosis: Normal

Periradicular diagnosis: Normal

No treatment needed at this time


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