

## Case Presentation February/March 2014:

### The Importance of Vitality Testing in the Decision Making Process whether to treat or not to treat:

### Non-surgical Root Canal Retreatment of a Maxillary Central Incisor associated with a Multilocular Periapical Lesion

The radiograph forms an integral part of our diagnostic tool box. The temptation is there to conclude “periapical lesion = infected tooth”. This is partly true, because in fact a periapical lesion *of dental origin* requires an infected pulp or root canal space to form <sup>1</sup>.

Not all osteolytic lesions that are radiographically associated with a specific tooth however are dental in origin. A positive vitality test of a tooth seemingly associated with a radiolucency should alert us to think “outside the square”:

The differential diagnosis should consider the general medical history of the patient, and could range from “normal anatomy” (for examples see Case Presentation September/October 2013 in “Archives” on our web site [www.endoongearge.com.au](http://www.endoongearge.com.au)) to “metastases from a primary neoplasm”, such as carcinoma of the breast for instance. Furthermore, *if the lesion is dental in origin*, it may not necessarily be caused by the tooth it appears to be associated with on the radiograph.

The following example describes a case in which an osteolytic lesion was discovered on a radiograph. This lesion was radiographically associated with a tooth (#21) that had been previously endodontically treated elsewhere, but it had a distinct multilocular appearance, enveloping the apex of tooth #22. This tooth tested reliably and reproducibly vital.

Non-surgical root canal retreatment (NSRCReTx) of tooth #21 alone resulted in the progressive resolution of the multilocular lesion, and the vitality of tooth #22 was preserved.

To illustrate the extent of the lesions present, as well as the healing response, we used cone beam CT technology. Relevant images are found below.

**Patient:** 39 yo male, referred by his general dentist for assessment #21. A periapical radiolucency was found associated with the previously root- treated tooth #21. Radiographs approximately 1 year apart (Fig.1 & 2) indicate an increase in the size of the lesion, with it enveloping the lateral incisor.

**Medical Hx:** No relevant medical Hx

**Dental Hx:** Teeth ##11,21 had been endodontically treated overseas some ten years ago. Cast posts and cores were placed at the time, and the teeth were restored with full coverage crowns. The patient is unhappy with the appearance of the crown on #21 and would like to have it replaced with a more aesthetic restoration.

**Chief complaint:** “My dentist referred me to have these teeth [21/22?] treated prior to making a new and more aesthetic crown for me on #21.”

**Objective findings:**

	13	12	11	21	22	23
Percussion	R	R	R	R	R	R
Palpation	R	R	R	R	R	R
Perio	WNL	WNL	WNL	WNL	WNL	WNL
CO <sub>2</sub>	R	R	NR	NR	R	R

R = normally responsive AR = Abnormally responsive NR = non-responsive WNL = within normal limits

**Radiographic (PA):** Both teeth (##11,21) had been restored with posts and crowns. A distinct periapical radiolucency is noted at the apices of #21 and #22. The existing root canal fillings (RCFs) in ##11,21 are irregular in shape, and unfilled root canal space is seen in #21. (Fig.1 & 2). There appears to be an excess of RCF material associated with the apex of #11, but the radiograph does not suggest the presence of a periapical lesion.

A cone beam CT was requested at this time, in order to better appreciate the extent of the existing periradicular lesion. The sagittal (Fig.3 -5), and coronal (Fig.6) views are shown. It must be noted that the periapical lesion above #21 does not appear to perforate the buccal plate, which is the reason it appears poorly circumscribed on the conventional PA<sup>2, 3, 4</sup>. The lesion clearly extends laterally, towards the #22 (axial view, Fig. 7). The CBCT-derived OPG is shown in Fig. 8.

**Assessment ##11,21:** **Pulpal Diagnosis:** ##11,21: Previously treated , #22: Normal  
**Periradicular diagnosis:** ##11,21: Chronic Periradicular Periodontitis  
 #22: Normal (reproducibly CO<sub>2</sub> +ve)

**Treatment:** The patient decided to have tooth #21 retreated non-surgically. Tooth #11 does not require NSRCReTx at this stage: Whilst the quality of the RCF is certainly substandard, no periapical lesion is noted on either the PA or the CBCT. The excess of RCF appears to be relatively innocuous. Tooth #22 tests reproducibly and reliably vital, and will not be endodontically treated, pending review in a few months' time.

Under LA and rubber dam the root canal of #21 was accessed through the existing crown. The post/core was removed, with the use of ultrasonics. The crown on #21 was retained throughout the entire course of care.

After a 4 week dressing period with  $\text{Ca(OH)}_2$ , #21 was re-obtured, using Mineral Trioxide Aggregate (MTA<sup>®</sup>) (Fig. 9). A post space was prepared, and a new post and core were placed at that time. The result is shown in Fig. 10.

**Follow-up (4 months):** A four-month review was scheduled with the patient. A new CBCT shows an excellent healing response even at this early stage, with progressive bony fill-in of the multilocular periapical lesion (Fig. 11-14). It is noteworthy that tooth #22 still tests reproducibly and reliably +ve to  $\text{CO}_2$ .

**Discussion:** This case underlines the necessity of a good diagnostic work-up, which includes both radiographic records and diagnostic tests. It is important to "think outside the square" if the diagnostic testing and the radiographs are not in agreement to support the most "common" conclusion.



Fig. 1 - taken 2011



Fig. 2 - showing the expanding lesion, enveloping #22, 1 year later



Fig. 3 – showing the periapical status above #11, with excess RCF material

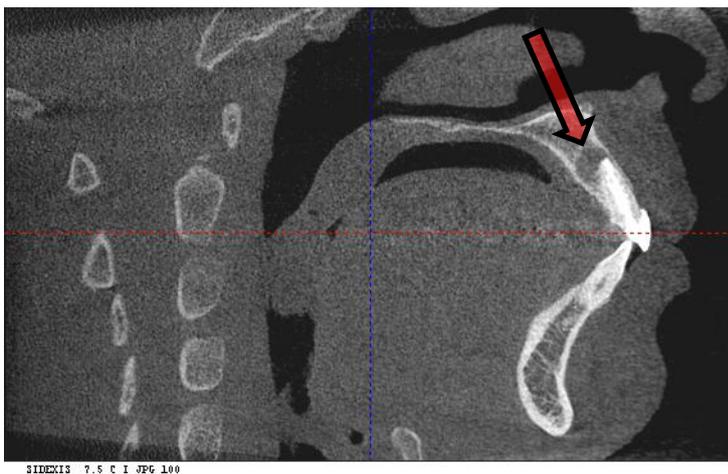


Fig. 4- showing periapical lesion contained within the spongiosa, above #21



Fig. 5 - showing the expansion of the periapical lesion to envelope the apex of the (vital) #22

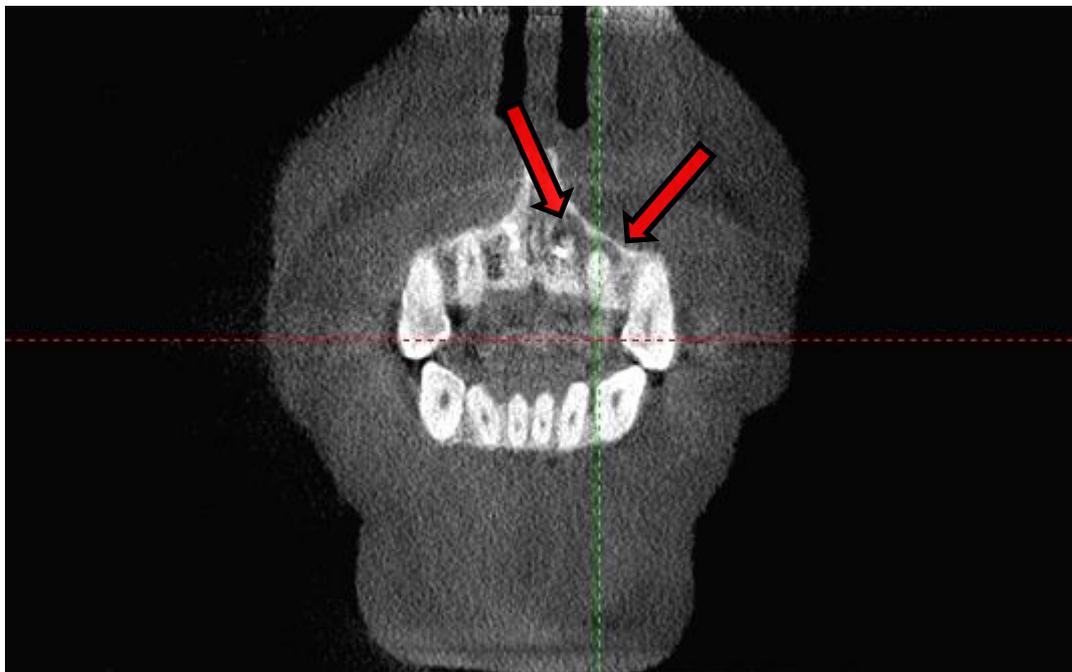


Fig. 6 –coronal view showing the multilocular nature of the periapical lesion

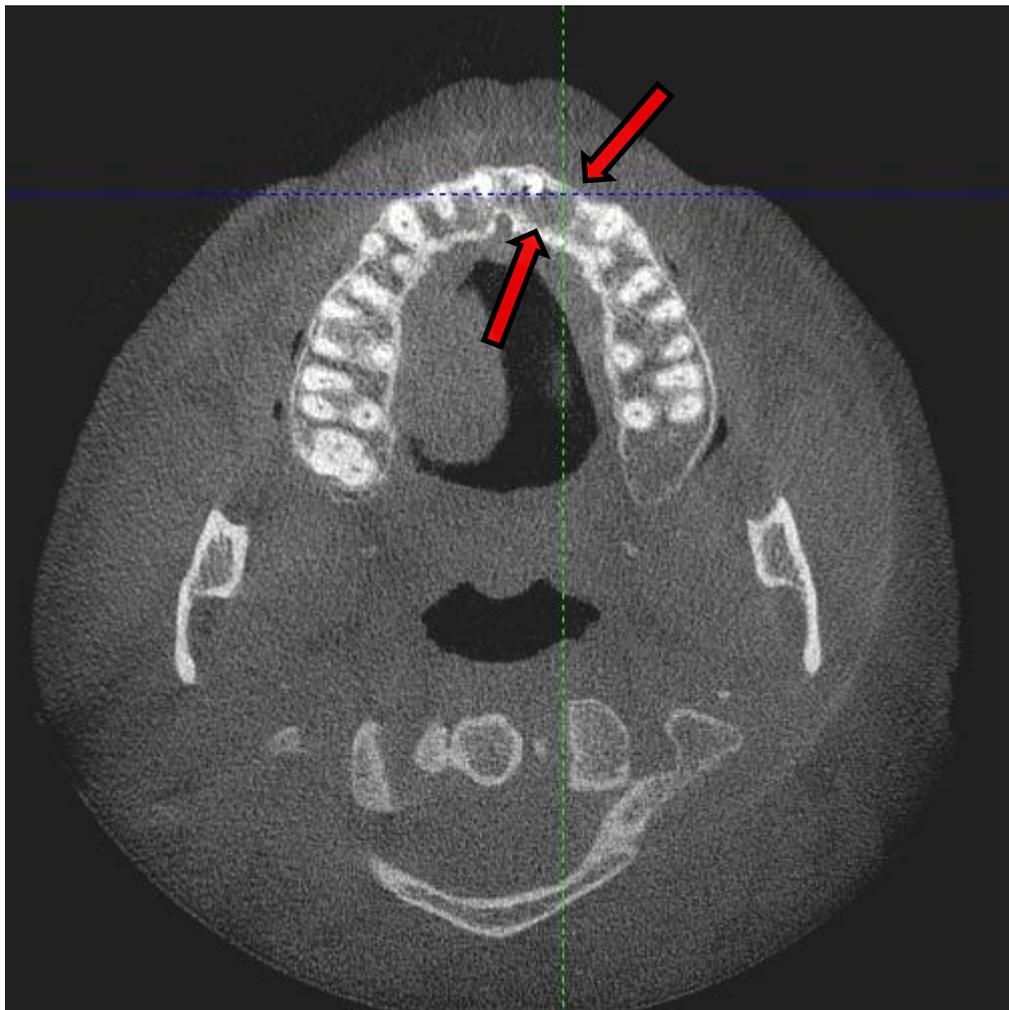


Fig. 7 – showing the lateral expansion of the lesion, to involve the lateral incisor region

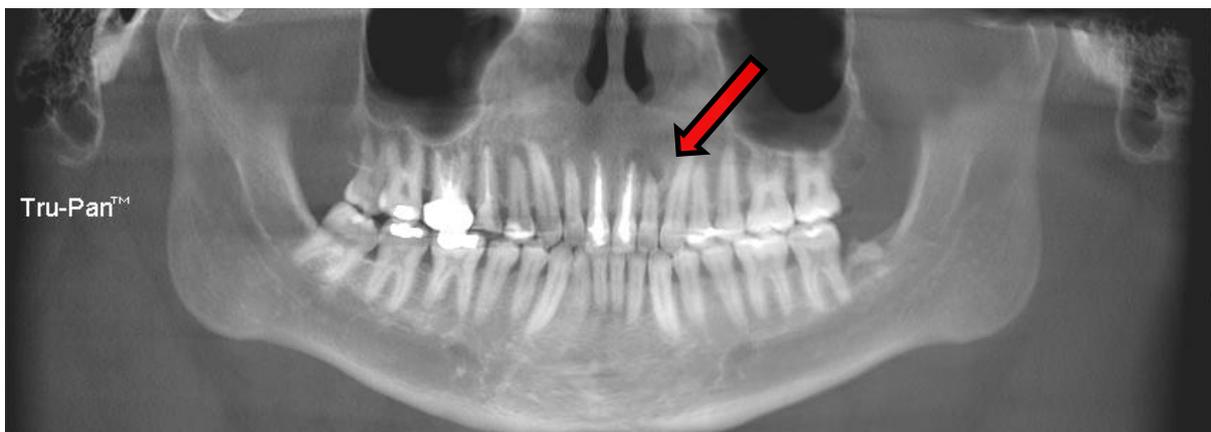


Fig. 8 – CBCT-derived OPG



Fig. 9 – MTA placed



Fig. 10 – MTA, post, core placed

**5 month follow up (Fig. 11-14):**

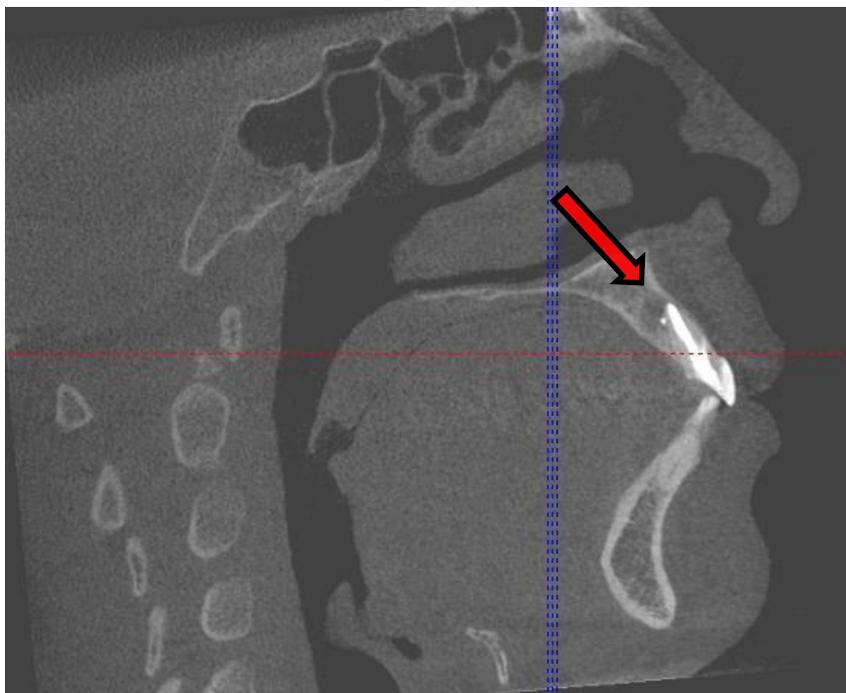


Fig. 11 – above #21: bony fill-in in progress

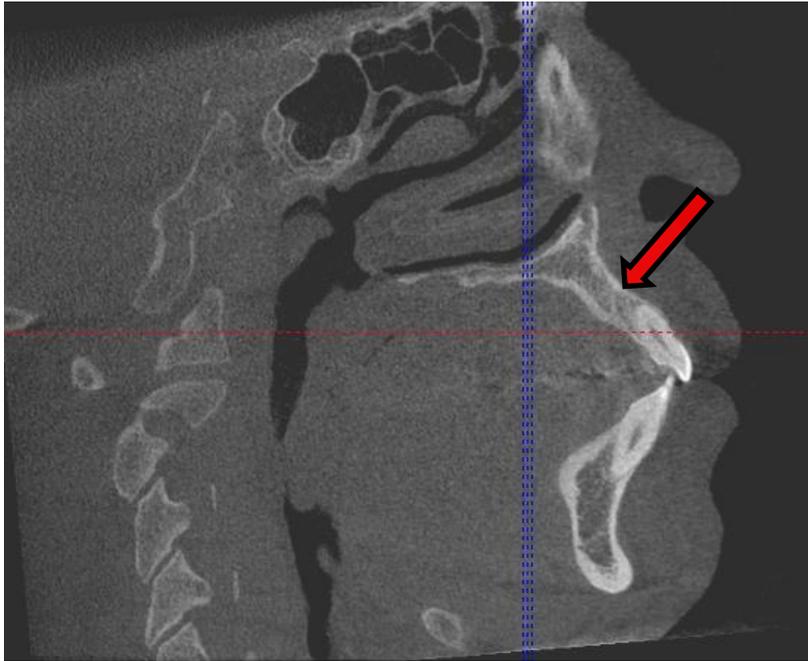


Fig. 12 – above #22: bony fill-in complete

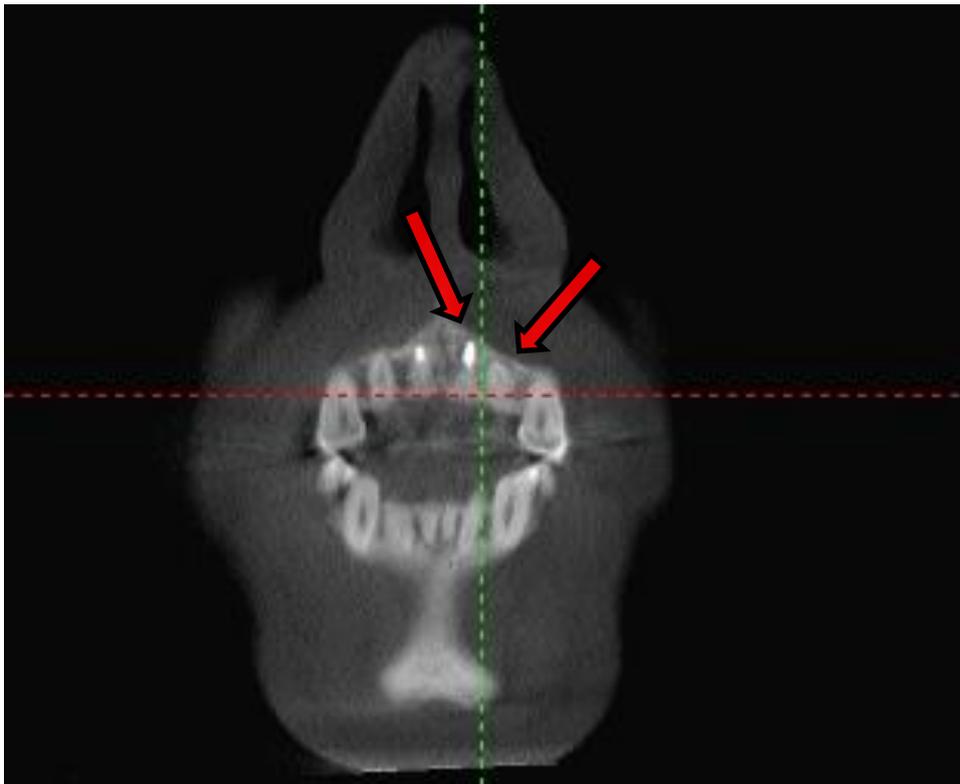


Fig. 13 – coronal view showing reduction of the lesion associated with #21, and disappearance of the lesion associated with #22

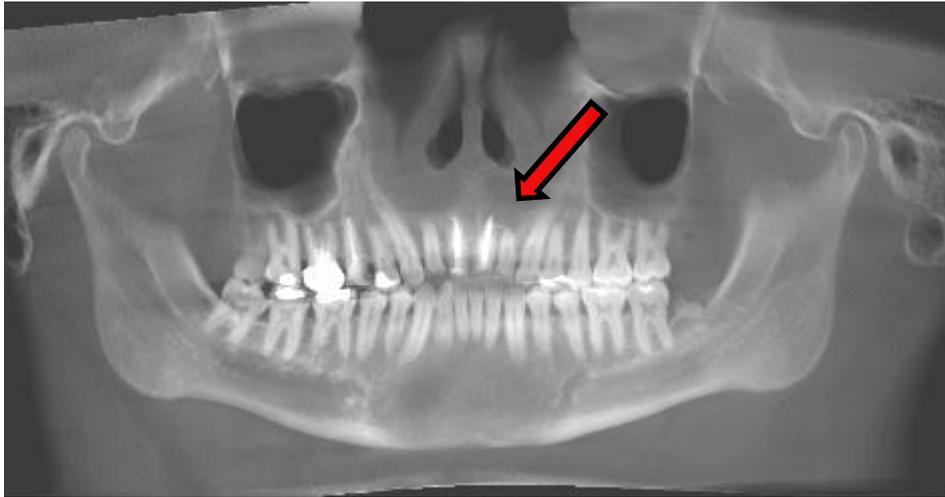


Fig. 14 –healing of the lesion in progress

### Case treated and compiled by Dr Torsten H Steinig

- 1: Moller AJ, Fabricius L, Dahlen G, Ohman AE, Heyden G (1981) Influence on periapical tissues of indigenous oral bacteria and necrotic pulp tissue in monkeys *Scand J Dent Res* **89**, 475-84.
- 2: Schwartz SF, Foster JK, Jr. (1971) Roentgenographic interpretation of experimentally produced bony lesions. I *Oral Surgery, Oral Medicine, Oral Pathology* **32**, 606-12.
- 3: Bender IB SS (1961) Roentgenographic and direct observation of experimental lesions in bone I *J Am Dent Assoc* **62**, 152-60.
- 4: Bender IB SS (1961) Roentgenographic and direct observation of experimental lesions in bone II *J Am Dent Assoc* **62**, 708-16.

Michael N. Franks  
Dr Torsten H. Steinig

Specialist Endodontists

T 02 9299 2275  
F 02 9299 8304  
<http://www.endoongee.com.au>

Floor 1 Suite 104-105  
King George Chambers  
375 George St  
Sydney NSW 2000