

## Detection of hidden vertical root fracture by stereomicroscope

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The vertical root fractures resulting as from trauma, as from the “cracked tooth syndrome”, are spotted within the “iatrogenic periodontal lesions” according to the Al-Fouzan (1) classification. The stereo microscope, an optical microscope variant typically exploiting the light reflected from the surface of an object rather than that transmitted through it (2), in the reported case has revealed the best tool to perform the resolving three-dimensional examination of the tooth. Aim of this paper is to describe a vertical root fracture, not otherwise detectable. A second upper molar, has been endodontically treated, because of the presence of an endo-periodontal lesion. Even though the treatment was performed according the standard protocol, after two years the lesion persisted and the tooth was extracted. After the extraction, the tooth was diaphanized to be observed with the stereomicroscope (Leica LED2000). The investigation clearly showed a vertical fracture, starting directly from the cervical line and a small hole on the distal surface of the root palatal cone. Mean values of measurements taken in 15 randomly points at 1x, 4x and 8x magnification were made. The fracture resulted to be long 9,79 mm and to have a mean width of 0,37 + 0,07 mm externally, and 0,15 + 0,02 mm internally. The mean area of the hole resulted of 0,85 mm<sup>2</sup>. All the analytical procedure was validated by t-student test, showing a p value < 0,0001. This vertical root fracture represented the unexpected pathway between the pulp and periodontal tissues and sure it caused the endodontic treatment failure, with tooth loss. It appears clear that a good diagnosis, following exactly the protocol stated in the literature, together with the patient’s compliance, are crucial basis to face such clinical challenge.

### References

- [1] Al-Fouzan KS. (2014) A new classification of endodontic-periodontal lesions Int J Dent. 919173. doi: 10.1155/2014/919173.
- [2] Schnitzler H. and Zimmer, K. P. (2008) Advances in stereomicroscopy. Proceedings of SPIE 7100: 7100P

### Keywords

Maxillary molar; crack line; stereomicroscopy.