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## **Cone beam computed tomography in Endodontics**

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## Letter to the editor

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Dear Editor,

We would like to congratulate the authors on the review article entitled "Cone beam computed tomography in Endodontics - a review".<sup>5</sup> The literature review presents a very thorough summary of the impact and application of cone beam computed tomography (CBCT) in diagnostic imaging in the field of Endodontics. The importance of the subject is increasing for the dental community as stressed in the article. Yet, we would like to highlight some related aspects of this technology as an adjunct to the discussion that was not enclosed in the article.

Regarding the specific application of CBCT in the diagnosis of vertical root fractures (VRF), we agree with the authors that in principle the CBCT could not be recommended for their diagnosis at this stage. Although some in vivo and ex vivo studies, and clinical case reports underline the superiority of CBCT compared with periapical radiographs on the diagnosis of root fractures, the diagnostic confirmation requires a keen sense of the clinical professional. Moreover, information obtained during the interview, clinical examination, and especially periodontal probing, are crucial parameters that need to be taken into account during evaluation of the derived information. The possibility of a false positive diagnosis of the observer especially in the presence of metal cast post should also be contemplated that may yield to an incorrect therapy.<sup>1</sup> Against the improvements in the CBCT for dental use, the available devices present resolutions still far below the resolution of computed-microtomography (CMCT), where the latter enables the operator to view changes in the microscopic structure of the teeth. Unfortunately, such technologies are available only to study small objects at laboratory settings.<sup>2</sup> The possibility of obtaining near resolutions of CMCT coupled with the CBCT may increase accuracy in the diagnosis of VRFs in the near future.<sup>4</sup> Thus, the advances in the new generations of CT scanners, using technologies with improved resolution ratio/radiation dose, would possibly bring a breakthrough in diagnosis of VRFs which is not there yet. Until then, guidelines for calibration of the operators could have been given in this article.

The review also emphasizes the training in CBCT in terms of knowledge of the clinician on the characteristics of endodontic complications, experience in the acquisition, interpretation and awareness of the limitations of the CBCT images. The problem is that general practitioners and even endodontists themselves, most frequently do not participate in setting the parameters of image acquisition and the elaboration of diagnosis but instead delegate this to the maxillofacial radiologists. Eventually, maxillofacial radiologists interpret solely the image or when available, combine the interpretation with the information provided by the clinician. In fact, one advantage with the CBCT images is that the clinician can view them on his/her own personal computer. However, then it becomes very imperative to use advanced software programs, providing high quality images. The availability of advanced tools, such as specific filters, software programs used at Radiology departments should be ensured that may allow better visualization of the lesions. The level of training and experience of the examiner may influence the identification of carious lesions on radiographs, and this statement holds also true for the diagnosis of endodontic deviations when CBCT is used.<sup>3</sup> Briefly, we contemplate that domain of computers and related tools, experience and calibration of the operator with computers, delegation of interpretation to maxillofacial radiologists are key elements to exploit the CBCT technology for endodontic diagnostics at best, which were not mentioned in the Discussion of this review article.

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