An Update on the Use of Cone-beam Computed Tomography in Dentistry

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Cone-beam computed tomography (CBCT) represents today the most widespread and most used 3D exam in dentistry. This diffusion is allowed by the fact that the equipment is the least voluminous, allows extremely reduced high-quality acquisition times compared to other tests, and its cost is lower than other diagnostics equipment, such as MRI.[1,2] The ability to modify the field of view (FoV) while maintaining very high image quality, and the functionality of various image management and re-processing software, allow total use in dentistry, passing from the smallest FoVs for a few dental elements in endodontics, to larger FoVs, for example in orthodontics.[3-5] Moreover, it also allows the study of the temporomandibular joint in gnathology, offering most of the indications useful to the clinician to complete the treatment plan, assisted by the use of MRI.[6] The software prepared for orthodontic use, allow increasingly reliable results in the study of cephalometry, avoiding the clinician the need to prescribe multiple diagnostic exams (orthopantomography and several telecranium) to obtain all the information necessary to properly plan the orthodontic treatment.[3,5,7] The possibility of adequately studying the bone anatomy and volume with this kind of devices allows to adequately plan complex implant-prosthetic rehabilitation, construction of surgical guides for more complex surgeries, by superimposing the radiographic images obtained with files for the reconstruction of models.[8,9] In endodontics, a careful anatomical evaluation is increasingly important to complete the diagnosis, and to improve the prognosis of endodontic treatments, avoiding iatrogenic errors such as fractures of rotating instruments and perforations.[10-13] In oral and maxillofacial surgery, even for orthodontic purposes, the exam offers all the information necessary to establish proximity to noble structures, with minimal deformations, which make it extremely reliable.[3,14] The continuous development of equipment and management software that allow to further reduce the radiation dose to which the patient is exposed, and to improve the resolution of the images, allows to consider CBCT as the state of the art of dental imaging, and with further important margins for improvements for the future.

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