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Accord between cone-beam computed tomographic images and panoramic radiographs

I read the article “Are panoramic radiographs good enough to render correct angle and sector position in palatally displaced canines?” in the March issue (Björksved M, Magnuson A, Bazargani SM, Lindsten R, Bazargani F. *Am J Orthod Dentofacial Orthop* 2019;155:380-7). I appreciate and congratulate the authors for their profound and immense contribution in highlighting the sector analysis for palatally displaced canines (PDCs) in panoramic imaging and comparing that with cone-beam computed tomographic (CBCT) scans. However, the conclusions raised a few questions with me.

The authors mentioned that when it comes to early interceptive treatment of PDCs, it is enough to use panoramic radiographs.¹ How easy was it to find the overlap in frontal view, the vertical distance to occlusal plane, angulation of canine to occlusal plane, dilacerations, and rotations? They have a significant relationship with the level of treatment difficulty. The lateral incisors near the PDC have shorter roots than the contralateral

ones adjacent to the normally erupted canines, and the morphologic differences make it even more difficult for the clinician to diagnose further lesions. How accurate can the diagnostic information expected to be gained for good optimization of a treatment plan?

When I look at the statement of clinical relevance in imaging, it is important to know what additional information CBCT can provide. CBCT is definitely thought to have advantages over panoramic radiographs because its 3-dimensional nature obviously allows for navigation of volume in orthogonal axial, sagittal, and coronal planes as well as nonorthogonal multiplanar reformatting views.² This gives unobstructed views of anatomic structures in the precise locations and offers a wider perspective on spatial relationships. In contrast, panoramic radiographs are limited by superimposition of structures, ghost images, air shadows, and, most importantly, the sensitivity to patient positioning errors, producing unequal magnification in horizontal and vertical dimensions.³ The other advantages of CBCT are absence of magnification and distortion and the ability to make precise measurements as a result of the isotropic nature of voxels that constitute the basic unit of each CBCT scan.³

The risk-benefit ratio of CBCT is favorable. Owing to various overlapping carcinogenic factors in our life, it is next to impossible to evaluate long-term stochastic effects of radiographic examinations.⁴ Therefore the concept of ALARA, suggesting that radiation should be kept “as low as reasonably achievable,” has to be adhered to, when justifying CBCT acquisitions by comparing dose exposure to the background radiation.

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