observe the early effects of PRP [platelet-rich plasma] on tooth movement." We evaluated the effects of PRP, and 14 days can be considered an acceptable duration. However, for orthodontic tooth movement and related animal model, 14 days might be considered a short duration. This study was designed as a preliminary study to observe the effects of PRP on tooth movement. We used 1, 3, 7, and 14 days to evaluate the effects of PRP; 30 days would also be beneficial, but we couldn't foresee the efficacy of PRP and avoided further use of 12 animals. Also, based on the results, we had considered designing further studies with longer durations. However, the present results, as far as we are concerned, did not exhibit clinical significance. A possible explanation might be as you stated, the nonautologous structure of the PRP, unlike in humans. Therefore, we decided not to perform further study.

Finally, we agree that using blood from other rats to obtain PRP restricts the biologic activity, which is the major advantage of the product. This is one reason for us not to continue to study PRP in rats.

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## Age as a limiting factor for panoramic imaging in patients with ectopic maxillary canines

I have read with interest the article by Björksved et al (Björksved M, Magnuson A, Bazargani SM, Lindsten R, Bazargani F. Are panoramic radiographs good enough to render correct angle and sector position in palatally displaced canines? Am J Orthod Dentofacial Orthop 2019;155:380-7) on the reliability of panoramic radiographs in diagnosing palatally displaced canines. I agree that the treatment of palatally displaced canines in the mixed dentition can be initiated and performed with the information on canine location available by means of clinical examination and the sector location of the ectopic canine on panoramic radiographs.

However, an important concern arises regarding the mean age of the study participants, 13.4 years, at the time of imaging. Normally in patients diagnosed with a retained primary canine at this age, all other permanent teeth but the third molars are fully erupted. Therefore, in most cases the panoramic radiograph is not needed for purposes other than diagnosing the position of the ectopic permanent canine. Björksved et al reported that in panoramic radiographs, sector location of impacted canines is only fair. On the other hand, the ectopic canine may have nearly completed travelling its altered path of eruption and possible root resorptions on adjacent teeth might not be diagnosed with the use of panoramic radiography. Cone-beam computed tomography (CBCT) provides precise information about location of the impacted canine and prevalence and degree of root resorption of adjacent teeth. This is of great importance for surgeons and orthodontists to provide a detailed diagnosis and an accurate interdisciplinary treatment plan.[1,2]

Compared with the diagnostic information available from a panoramic radiograph, dose-reduced small-field CBCT (4 × 4 cm) may have several benefits.

The low end of the CBCT dose range overlaps with the range found with panoramic radiography.[3] Using small fields of view and altering tube potential and current for the 360° rotation protocol, assessment of periodontal structures can be performed with a smaller dose without substantially affecting visualization.[4] There is great potential for dose reduction through mA with a minimal loss in image quality,[5] and CBCT scanners can be optimized by using of the highest kV along with the shortest exposure time and a task-specific mA.[6]

Because there is only 1 small area of interest in these cases, a field of view of 4 × 4 cm may be sufficient. When using small fields of view and dose reduction the effective dose for the 3-dimensional CBCT machines may be lower or equal to the effective dose of conventional panoramic or even digital units.[7]

Ectopic permanent canines located in sectors 3, 4, and 5 (nomenclature according to Lindauer[8]) are strong indicators for possible root resorption on adjacent teeth.[2,9-12] American Academy of Oral and Maxillofacial Radiology clinical recommendations and the European Sedentex CT and DIMITRA (Dentomaxillofacial Pediatric Imaging: An Investigation Towards Low-Dose Radiation–Induced Risks) guidelines support the need for CBCT imaging for the improvement of diagnosis and surgical and orthodontic treatment planning in these cases.[13-15]

Dose-reduced small-field CBCT imaging should be preferred to panoramic radiographs in the early permanent dentition if the only reason for imaging is exploration of the position of an ectopic canine.

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## Authors' response

Thank you for your interest in our article. Because mean chronologic age is not the same as dental age, we don't agree with the statement referring to the mean age of the study participants being 13.4 years, "Normally in patients diagnosed with a retained primary canine at this age, all other permanent teeth but the third molars are fully erupted." Among the study participants 37 of 59 had persistent primary teeth. We also found agenesis of 19 teeth (third molars not included) and participants with impacted second premolars in our study sample, which is consistent with findings of association between impacted teeth and other tooth and developmental disturbances in other studies.[1] Knowledge of the presence of other tooth and developmental anomalies in association with a displaced maxillary canine (PDC) is as crucial as diagnosing the PDC itself. Despite the limitations of a panoramic radiograph, it provides an important overview of the teeth and jaws of interest, not only for rendering the position of PDCs, when CBCT is not crucial for treatment planning.

CBCT optimization is complicated and requires the radiologist be vigilant. The parameters that are taken into account include, besides kV, mA, FOV, and rotation degrees, filtration type and amount and voxel size. The highest impact in dose optimization seems to be that of the FOV when other exposure factors are held constant.[2] When the parameters are optimized to a dose level that is similar to a conventional panoramic examination, a significant reduction in image quality occurs, and the gain of information in a CBCT is poor.[3] Therefore, the clinical task of importance is the choice of imaging technique in children. Even at similar effective dose level for a conventional panoramic examination, the child doses are reported to be greater than adult doses owing to the increased radiosensitivity of tissues in children.[4] Also, the cumulative dose for children with dental anomalies, such as impacted canines, is significantly higher than other groups of children exposed to CBCT owing to usually multiple exposures and higher number of CBCT examinations compared with other pathologic conditions.[5] Therefore, minimizing both the effective dose as well as the cumulative radiation dose in children is essential.

Radiation dosage with the use of x-ray should benefit the patient and provide the dentist with sufficient information for that time point, which is the reason for principles such as ALARA (as low as reasonably