

LETTER TO THE EDITOR

Early prediction of maxillary canine impaction: number doubts: Author response

Dentomaxillofacial Radiology (2016) 45, 20160263. doi: 10.1259/dmfr.20160263

Cite this article as: Algerban A, Storms AS, Voet M, Fieuws S, Willems G. Early prediction of maxillary canine impaction: number doubts: Author response. *Dentomaxillofac Radiol* 2016; 45: 20160263.

To the Editor,

We would like to thank our colleagues Fehlberg and da Silveira¹ (referred to as the authors) for their interest in our recent article² and expressing their questions. The topic of impacted maxillary canines remains an interesting subject in clinical orthodontic research. Being able to predict maxillary canine impaction at an early age would be the ultimate desire of many orthodontists in clinical practice.

The first question the authors address relates to the origin of and number contained in the retrospectively assembled test data set. As explained in the Methods and Materials section, a total of 828 patients were selected based on the presence of 2 panoramic images taken between the age of 7 and 14 years, with a minimum of 1-year interval and a maximum of 3-year interval (T_1 and T_2). After exclusion of 712 patients, 116 patients remained, of whom 30 patients showed unilateral maxillary canine impaction, constituting the training data set. Furthermore 30 patients, matched for age and gender, were selected from the remaining 86 records and displaying bilateral canine eruption at T_2 . In total, the test data set would consist of 60 subjects with a total of 90 normally erupting canines; 30 contralateral canines of the training data set and 60 canines that displayed bilateral eruption at T_2 . We hope this explains what the numbers mentioned in the article stand for.

The second question relates to the quantitative measurements performed on the panoramic radiographs and reported in the Results section. We think the authors might have misunderstood what is written in Paragraph 2. It is stated that for the impacted canine group (training data set), the canine position to the midline remained the same between T_1 and T_2 . It is also

stated that the contralateral canine became more upright (angle to the midline decreased on an average with 12° in the test data set with normal erupting canines). It is a usual finding that the canine becomes more upright during eruption.

The next finding was the decrease of the angle between the canine and lateral incisors in the impacted canine group, which was on an average 13° and mostly owing to a further uprighting of the canine and partly also owing to the lateral incisor root in the training data set. Oppositely, the angle between the canine and lateral incisor seemed to increase slightly in the test data set, often owing to a more mesial inclination of the lateral incisor root. One has to remember that the data set was selected retrospectively from the university hospital database and that most panoramic radiographs at that age are taken in view of malocclusion concerns. In view of that, most of these patients do show some degree of arch length discrepancy and although we see spontaneous eruption of the canines, they do create some minor neighbouring tooth disturbances.

Similarly for the angle between premolar and lateral incisor. Often at T_1 , the first premolar has just initiated root formation while the crown is more or less canted owing to the inadequacy of the available space in combination with the impacted canine. Premolar eruption as such will lead to reorientation and normalization of the premolar tooth angulation. The same mechanism as described above takes place, where canine eruption influences both lateral incisor and first premolar tooth orientation.

Overall, one has to eventually keep in mind that there is a large variation in nature and together with the small sample size of the present study, it should not be surprising that for the presented values, a large variation and standard deviation exist, which sometimes may confuse the results. Although we may overlook cases and describe what is evaluated, there is still a need to perform more and prospective evaluations of this kind. The authors should be encouraged to set up such kind

Correspondence to: Guy Willems. E-mail: guy.willems@med.kuleven.be

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Received 24 June 2016; accepted 4 July 2016

of evaluations which could be useful to anticipate the most severe canine impaction cases at an early stage.

Ali Alqerban^{1,2}, Ann-Sophie Storms²,
Martine Voet², Steffen Fieuws³ and Guy Willems²
¹*Department of Preventive Dental Sciences, College
of Dentistry, Prince Sattam Bin Abdulaziz*

University, Al-Kharj, Saudi Arabia

²*Department of Oral Health Sciences – Orthodontics,
KU Leuven and Dentistry, University Hospitals
Leuven, Leuven, Belgium*

³*I-BioStat Department of Public Health, KU Leuven
and Universiteit Hasselt, Belgium*

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