

## Letters to the Editor

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### Radiation risk–benefit in orthodontics

Sir,

I read the article “Ossification of the midpalatal suture after surgically assisted rapid maxillary expansion” by J. de Araújo Gurgel *et al.* with great interest (de Araújo Gurgel *et al.*, 2012). It provided me with scientific proof of the commonly accepted notion that complete re-ossification of the midpalatal suture requires about 6 months, at least more than 120 days. With this proof, my knowledge ceased to be only anecdotal.

However, I was concerned by the ethical justification for obtaining six occlusal radiographs for the purpose of this study taking into consideration the associated radiation close to the brain and directed towards the reproductive organs. My concern was heightened by the age of the population: an average age of 25.33 years and a range of 18.33–41.66 years, placing it well within the childbearing age. Furthermore, the low mean indicates that the majority of patients were distributed towards the lower end of the range.

It is reported that all individuals gave their consent. But how far do laypersons really grasp what they agree to? How well do they understand radiation? How informed were they about its harmful effects? The local ethical committee apparently approved the study. This surprises me somewhat; if I were a member of this committee, I would have posed objections.

The article makes no mention of measures taken to protect the patients from radiation. Even if all possible was done in this context, I still question how such a study could be conducted.

Allow me three relevant quotes. The first two are from the “Radiation Protection: Cone beam CT for dental and maxillofacial radiology, Provisional guidelines 2009” prepared by the European Sedentext project (SEDENTEXT, 2011). Even though this report is about cone beam tomography, the facts apply to all types of radiation:

‘When patients undergo X-ray examinations, millions of photons pass through their bodies. These can damage any molecule by ionisation, but damage to the DNA in the chromosomes is of particular importance. Most DNA damage is repaired immediately, but rarely a portion of a chromosome may be permanently altered (a mutation). This may lead ultimately to the formation of a tumour.’ and

‘While doses and risks for dental radiology are small, a number of epidemiological studies have provided some

limited evidence of an increased risk of brain (Longstreth *et al.*, 1993; Preston-Martin and White, 1990), salivary gland (Preston-Martin and White, 1990; Horn-Ross *et al.*, 1997) and thyroid (Hallquist *et al.*, 1994) tumours for dental radiography.’

The third citation is taken from the latest FDI news (World Dental Federation, 2012):

‘Statement from the American Dental Association

The American Dental Association notes that it is aware of a recent study that associates annual or more frequent dental X-rays to an increased risk of developing brain tumors. The ADA’s long-standing position is that dentists should order X-rays only when necessary for diagnosis and treatment, ...’ (underline by this author)

Although these statements do not derive from scientific studies, the sources are sufficiently reputable not to be dismissed lightly.

In conclusion, this letter to the Editor is written *sine ira et studio* and is not meant in any way to offend the authors. If my children were to seek my advice on whether to participate in this study, I would definitely recommend against it.

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## Comparison of self- and conventional-ligating brackets in the alignment stage

Dear Sir,

In volume 34 issue 2 of the *European Journal of Orthodontics* the readers can find an article by Wahab *et al.* (2012) on comparing the efficacy of Damon™ 3 self-ligating brackets (SLB) with Mini Diamond conventional ligating brackets (CLBs) in alignment of the upper labial segment teeth during fixed appliance therapy. We would like to express several concerns regarding this article.

First of all, the authors need to be congratulated on their methodologically sound RCT studies in which patients between 14 and 30 years of age (mean 20.7 years) who met the inclusion criteria, were invited to participate and were randomly allocated to be treated using either SLB or CLB. However, we could not find any information on how patients were randomly allocated into the groups. In addition, the age span from 14 to 30 years old is large. Because we know that teenagers are more sensitive to force than adults, and crowding is relieved more easily (Kyomen and Tanne, 1997).

Further, there are several statements reported in the paper that are inaccurate. For example, Mini Diamond brackets aligned the teeth faster than Damon™ 3 but only during the first month, while in Table 2, there is no statistically significant difference in the rate of tooth alignment (LII scores) changes during treatment for the two bracket groups. Moreover, the results of this study indicate that in general, SLB are not superior to CLB in terms of tooth alignment during the aligning and levelling stage, but Table 3 shows that CLB showed 98 per cent of crowding alleviation as compared with 67 per cent for SLB after 4 months of alignment and levelling. The percentage of crowding alleviation nearly closed to 100% in CLB while only 67% in SLB. These facts contradicted the authors' conclusion that SLB are not superior to CLB.

Third, the authors state that 'there is a difference between the displacement of the six anterior teeth, so aligning teeth

may take more time'. Pandis *et al.* (2007) showed that the Damon 2 brackets aligned the teeth 2.7 times faster than conventional bracket in the moderately crowded cases.

Fourth, in the abstract Mini Diamond brackets aligned the teeth faster than Damon™ 3 but only during the first month. There was no difference in efficacy between the two groups in the later 3 weeks. Accordingly to the article instead of stating '3 weeks' it should state '3 months'.

Finally, the authors' observation time is only 4 months, the time is too short. In my clinical practice, I find that SLB align upper teeth faster than traditional bracket because of lower friction (Kapur *et al.* 1998; Harradine, 2008). If the trial time was extended would the result be different?

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