

SCIENTIFIC SECTION

Commentaries on scientific papers published in this edition

Tooth-size discrepancy and Bolton's ratios: the reproducibility and speed of two methods of measurement

S. A. Othman and N. W. Harradine

Most orthodontists will regularly encounter cases with obvious tooth-size discrepancies (TSDs) as well as the occasional case when it just seems difficult to make the anterior teeth fit together without leaving spacing somewhere in the labial segments. A recent review by Othman and Harradine reported that the prevalence of significant anterior TSD may be as high as 30%.¹

Bolton's tooth size analysis is probably the most commonly recommended method of objectively assessing TSD. However, while most orthodontists will be familiar with this diagnostic and treatment planning tool, many will use it infrequently, possibly due to the amount of time required to carry it out using conventional manual methods.

The present paper compares the speed of use of manual and digital methods by four different operators, and reports a comprehensive error analysis. The findings are interesting in that while they support the use of the digital HATS software method from the point of view of reducing measurement time, the magnitudes of the errors associated with this newer method and the conventional manual method were similar and relatively large. The standard deviations of the replicate measurements in the random error assessment were of the order of 1 mm which is close to the size of what would be regarded as a clinically significant TSD.

Perhaps the most important conclusion from the paper is that single estimations of TSD should be treated with 'great caution', particularly when clinical interventions are planned on the basis of the analysis. The study findings reassuringly suggest that increasing operator experience with these techniques may reduce this magnitude of error. However, further research is needed to establish whether the error magnitude can be reduced to a level where it has an insignificant likelihood of adversely affecting the clinical decision-making process.

Chris Johnston
Belfast, UK

Reference

1. Othman SA, Harradine NWT. Tooth-size discrepancy and Bolton's ratios: a literature review. *J Orthod* 2006; **33**: 45–51.

Long-term clinical evaluation of bracket failure with a self-etching primer: a randomized controlled trial

P. Banks and B. Thiruvengkatachari

The study qualifies as one of the most sound and well-designed manuscripts on the subject, which interestingly is gradually losing its appeal in the orthodontic literature.

This declining interest – of researchers at least – in self-etching primers (SEP), reflects a deterioration of the initial enthusiasm, which may be associated with: the potential irritation of adjacent tissues coming in contact with the substance; the absence of data on the degree of double carbon bond conversion in polymers bonded with SEP; and the largely unexplored long-term kinetics of the monomer release of resins bonded with SEP. The potential incorporation of residues, arising from the non-rinsed etched enamel, in the resinous matrix may disturb the polymeric network formed. This may enhance hydrolytic phenomena documented to occur in these materials, and exaggerate monomer leaching.

However, it is not at all certain that this list of concerns has been instrumental in influencing the number and frequency of SEP papers appearing in the orthodontic periodicals. The basic reason behind this may be the overestimated role of SEP in reducing the steps in bonding. The authors of the present study noted a 25-second difference between the two bonding schemes per bracket, a value which, however, largely depends on individual skills and clinical setup. Moreover, this 25-second difference is not real: a large body of evidence has indicated that prophylaxis of enamel is not necessary for orthodontic bonding in visually clean surfaces, since neither bond strength nor SEM appearance of enamel varies between prophylactically treated and untreated enamel. With the introduction of SEP, which is a highly technique-sensitive method, however, this step is an absolute necessity. Therefore, the roughly eight minutes saved in the full bonding of two arches by not rinsing the enamel, may be partially consumed on enamel surface treatment.

Theodore Eliades
Athens, Greece