

Longer treatment times with self-ligated orthodontic brackets

Abstracted from

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Question: How do the characteristics of orthodontic brackets affect fixed appliance therapy?

Data sources The Medline, Cochrane Library, Biomed Central, BBO including LILACS, Ind Med, Sceilo, Clinical trials.gov, Conference paper Index, Digital Dissertations, German National Library of Medicine (ZB MED), Google Scholar, ISI Web of Knowledge, metaRegister of Controlled Trials, OpenSIGLE and Scirus databases were searched.

Study selection Randomised controlled trials (RCTs) and quasi-RCTs in patients having fixed-appliance orthodontic treatments were considered.

Data extraction and synthesis Study assessment data extraction and risk of bias assessment was carried out independently by two reviewers. Overall quality of evidence was based on the Grades of Recommendation Assessment, Development and Evaluation (GRADE) approach. Random-effects meta-analyses were performed where data could be pooled.

Results Twenty five trials (1321 patients) were included. The majority (24) compared self-ligated (SL) and conventional brackets (CL). No trials primarily investigated the effect of bracket material and no indirect comparison was possible. Two trials assessed the bracket slot size but found no consistent difference between 0.022" and 0.018" brackets. Four studies contributed to a meta-analysis that showed overall duration of the orthodontic treatment be significantly longer in the SL group by 2.01 months (95%CI; 0.45 to 3.57).

Conclusions Based on existing evidence, no clinical recommendation can be made regarding the bracket material or different ligation modules. For SL brackets, no conclusive benefits could be proven, while their use was associated with longer treatment durations.

Commentary

Every now and then controversy breaks out in orthodontics. The most recent debate has been concerned with the development of 'new' wires and brackets. Importantly, the manufacturers of the brackets and their advocates have made claims that their use results in faster treatment, less discomfort and a reduction in extractions. There is no doubt that many orthodontists and their patients would welcome these benefits. These claims resulted in widespread adoption of the new brackets, in the absence of high-level research evidence.

However, over the past few years there have been several trials and the results of these are condensed in this systematic review.

This review is mostly concerned with trials of conventional vs self ligating brackets and the results are clinically relevant.

This was a standardised systematic review based on Cochrane guidelines, but not published as a Cochrane review. They clearly set out their aims and their inclusion criteria. They only included RCTs and quasi- RCTs. They also carried out an assessment of risk of bias and evaluated the quality and strength of the evidence, according to the GRADE (<http://www.gradeworkinggroup.org/index.htm>) approach. After extensive and thorough analysis of 1528 initial citations, they included the results from 25 papers.

When I considered these papers; three publications reported data from one trial and several others reported at the end of various stages of orthodontic treatment. This tends to be characteristic of orthodontic trials and is partly due to the 'need to publish' on a treatment that takes 24 months to complete. It was, therefore, important to note that only four papers reported on trials that had followed patients through to the conclusion of treatment, which is clearly the most relevant end point for orthodontic treatment. They presented a very detailed results section. They concluded that overall, the use self-ligating brackets did not confer advantages in terms of treatment effectiveness/efficacy or side effects of treatment. However, overall treatment was longer with the new self-ligating brackets!

This was a very thorough and detailed systematic review. My only criticism is that, arguably, it was too detailed and it could have been simplified by only including data that were relevant to the conclusion of treatment. When I consider these results along with other publications, there appears to be little more to be said on self-ligation apart from 'it offers no advantages'; as others have said 'the osteoclasts and osteoblasts do not recognise the wires and brackets'...

Practice points

- There appears to be no advantage in the use of self-ligating brackets when compared to conventional brackets for orthodontic treatment
- The most important outcomes of orthodontic treatment should be collected at the end of orthodontic treatment.

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