

COMMENT



Orthodontics

Clear aligners vs fixed appliances: which treatment option presents a higher incidence of white spot lesions, plaque accumulation and salivary caries-associated bacteria?

Govind Malhi ¹✉

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A COMMENTARY ON**Raghavan S, Abu Alhaija E S, Duggal M S, Narasimhan S, Al-Maweri S A.**White spot lesions, plaque accumulation and salivary caries-associated bacteria in clear aligners compared to fixed orthodontic treatment. A systematic review and meta-analysis. *BMC Oral Health* 2023; **23**: 599.**PRACTICE POINT**

- Patients should be made aware that despite the results showing a reduction in plaque accumulation in clear aligner therapy when compared to conventional fixed orthodontics, maintaining excellent oral hygiene should be of paramount importance with either treatment modality.

DATA SOURCES: Multiple databases were searched electronically in order to find relevant studies for the meta-analysis. These included: MEDLINE, Scopus, Embase, Google Scholar, Clinical trial registry, OpenGrey and ProQuest. Two independent reviewers were used to assess the certainty of evidence and risk of bias.

STUDY SELECTION: The eligibility criteria for the studies were as follows: randomized controlled trials and non-randomized studies that compared the incidence and severity of white spot lesions, plaque accumulation and salivary caries-associated bacteria between clear aligners and conventional fixed appliances in patients undergoing orthodontic treatment. In total, 14 studies met the criteria, with 8 of the studies deemed suitable for meta-analysis.

DATA EXTRACTION AND SYNTHESIS: Two independent reviewers carried out data extraction with a form composed of the following subheadings: Study information, Population, Intervention and control, Outcomes. The risk of bias was assessed using the ROBINS-I tool and a revised version of ROB-2, the Cochrane risk of bias tool. GRADEpro GDT software was used to assess the quality of evidence. To calculate the size of the effect of the different treatment options, the mean and standard deviation were extracted from all included studies. Heterogeneity was assessed using chi square and I^2 tests, with a p value below 10% being indicative of significant heterogeneity for the chi square and a value greater than 50% being indicative of significant heterogeneity for the I^2 tests.

RESULTS: With regards to plaque accumulation, the effect size was measured at 3 time points: 3 months, 6 months and 12 months. At all the time points assessed within the 8 studies included in the meta-analysis, the effect size was greater for clear aligners. With regards to white spot lesions, 4 studies were available to assess the incidence of white spot lesions. Three studies reported a lower risk of developing white spot lesions in clear aligners, where one study reported no difference. As all 4 studies used different methodologies, a meta-analysis was not possible. With regards to salivary caries-associated bacteria, 2 studies reported a higher concentration of bacteria in conventional fixed appliances. Meta-analysis was not performed due to lack of studies.

CONCLUSIONS: Based on the evidence presented, clear aligners appear to be associated with less plaque accumulation and less salivary caries-associated bacteria when compared with conventional fixed appliances. Therefore, this could be related to the reduced incidence of white spot lesions in clear aligners.

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GRADE Rating:

COMMENTARY

With regards to this systematic review and meta-analysis, it can be said that it provides value for the discipline of orthodontics. Reports from 2021 estimate over 21 million people globally have

started a course of clear aligners¹, highlighting the importance of conducting and subsequently analyzing research comparing clear aligners to conventional orthodontics in a variety of different areas. With such a growing interest in clear aligner therapy worldwide, a strong emphasis should be placed on ensuring a minimal risk of harm to a patient's dentition is present during clear aligner therapy.

¹Oral Maxillofacial Surgery and Orthodontic Department, Victoria Hospital, Kirkcaldy, Scotland, UK. ✉email: govmalhi@gmail.com

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Having said this, the authors are aware of multiple aspects that could be improved upon in order for the results of the studies to be used in a more generalized way. For example, conducting a multiple-centre study to investigate any of the aspects looked at within the analysis. Also, having a clear standardization process for the studies to follow to ensure quality randomized control trials are carried out would improve the quality of the research.

If this type of review and analysis was to be carried out again in the future, it is hoped that there would be a larger number of studies available to be included, to allow increased applicability to the general field of clear aligner therapy.

To conclude, the results of this systematic review and meta-analysis can be helpful for dentists and dental care professionals when discussing treatment options for patients presenting with malocclusions and discrepancies that they wish to correct.

REFERENCE

1. Bissett G. How clear aligners offer opportunities in today's market - dentistry. 2022. <https://dentistry.co.uk/2022/09/24/how-clear-aligners-offer-opportunities-in-a-growing-market/>.

COMPETING INTERESTS

The author declares no competing interests.

ADDITIONAL INFORMATION

Correspondence and requests for materials should be addressed to Govind Malhi.

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