

Oral Hygiene Comparison

Fixed vs. Removable Orthodontics

DEN 1200 - D206

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Introduction

Malocclusion is a very common occurrence in people from all walks of life and orthodontic appliances are mostly used to correct them. While they are very effective in fixing malocclusions, they also make removal of plaque much more difficult for patients. Clear aligners are preferred over fixed appliances because they are removable and more aesthetically pleasing as opposed to fixed braces. However, as dental hygiene students we wanted to explore the differences and similarities between both types of orthodontic treatment from an oral health perspective. We read and analyzed articles about the impact of orthodontic treatment on the periodontal health, patients concerns about plaque accumulation if they get fixed appliances and patient's pain and discomfort with either of the orthodontic treatment. All our articles have one thing in common; trying to figure out which orthodontic appliance is best for the patients and educating ourselves on the pros and cons of these appliances so that we can educate our patients.



Fixed vs. Removable Orthodontic Appliances



- Our research topic represents the assessment of different orthodontic appliances and their ability to allow patients to maintain good oral hygiene (OH).
- The reason behind our topic is that 2 out of 3 people in our group have had experience with both fixed and removable orthodontic appliances and have first hand experience with both the benefits and disadvantages for both types of appliances. Given our experience with the appliances we thought it would be an appropriate topic for our research paper.

➤ **Background**

Past researchers stated that clear removable aligners are more popular amongst patients due to aesthetics but researchers wanted to find out if clear removable aligners were indeed more beneficial than the fixed orthodontic appliances in terms of pain, end result, oral hygiene, food consumption and analgesics intake .

“Which orthodontic appliance is best for oral hygiene? A randomized clinical trial.”

by : Aditya Chhibber, Sachin Agarwal, Sumit Yadav et al.

Background

- Plaque accumulation is a major concern with fixed orthodontic appliances
 - inhibit access for proper oral hygiene
- Clear aligners are thought to facilitate better oral hygiene than traditional braces
 - Removable: able to brush/floss all surfaces with ease

Purpose of the Study

- Compare the effects of different types of orthodontic appliances on a patient’s oral health
- The study was a randomized control trial
- Conducted with 71 participants randomly separated into 3 groups
 - 22 to self-ligated brackets (SLB)
 - 22 to elastomeric-ligated brackets
 - 27 to clear aligners (CLA)

Methods

- Conducted over an **18-month period**
- **Plaque index** was the primary outcome measured
- **Gingival, and papillary bleeding indices** were secondary outcomes measured
- A baseline measurement was taken before the trial began and outcomes were again measured after *9 months (short term)* and *18 months (long term)*



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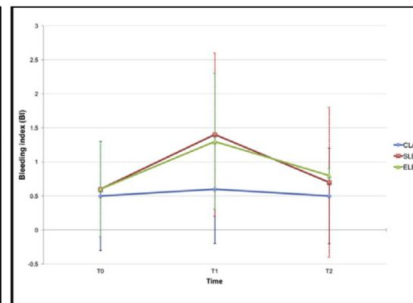
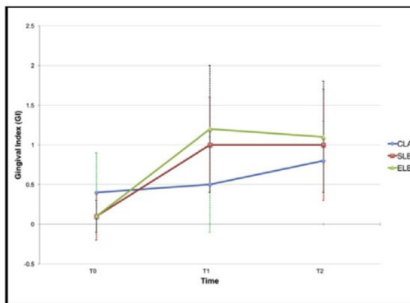
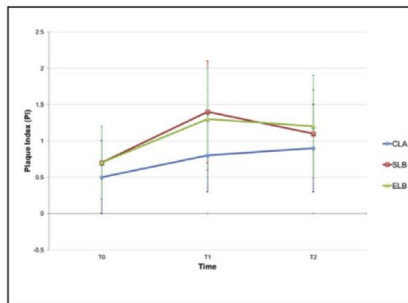
Results (found to be statistically insignificant)

- CLA group showed lowest average values for all 3 tests
- *At second follow up* → CLA + SLB groups had better OH
- CLA group compared to ELB
 - 86% less likely to have degree of inflammation
 - 90% less likely to have papillary bleeding
- SLB and ELB groups had no significant differences in OH

Conclusions

- CLA group had better gingival index and papillary bleeding scores in the *short term*
 - Potentially due to excitement over experiment → then wearing off after 9 months
- The authors concluded that the oral hygiene of a patient is unlikely to be affected whether they choose to have clear CLA, SLB or ELB
- There is difficulty in collecting accurate results because of lack of blinding of the participants, since they were aware of which groups they were in

- Perhaps less professional OH intervention → to see if the participants would keep up on their own



Impact of Fixed Orthodontic Appliance and Clear Aligners on the Periodontal Health: A Prospective Clinical Study

by Ada Carolina Pango Madariaga, Rosario Bucci, Robert Rongo et al.

Background:

- The differences between impact of orthodontic appliances and clear aligners on periodontal health.

Purpose of the study

- To evaluate the periodontal health of patients who have fixed orthodontics appliances and clear aligners after a 3 month period.

Design/Methods

- This was a prospective clinical study. The participants included: 40 patients, 20 had fixed appliances (Fixed Group-FG) and the other 20 had clear aligners (Clear Aligners Group-CAG).

At the starting point measurements of the probing depth, plaque index, bleeding on probing, gingival recession and biotype were taken from both groups.

Both groups also received a dental cleaning and oral self care instructions from a dental hygienist and received bi-weekly check-ins to reinforce the instructions previously given.

Results and Conclusions

- At the end of the 3 month period, there were no significant differences in the periodontal health of participants who wore fixed appliances and clear aligners.
- This study also found that regardless of the type of orthodontic treatment used, plaque accumulates quicker because both brackets and aligners make removal of plaque difficult. Therefore, the intervention of a dental hygienist and oral self care are crucial in maintaining the periodontal health of patients undergoing orthodontic treatment.
- The results also showed that the plaque index of the clear aligners group was significantly lower than that of fixed group. Nonetheless, there was an overall improvement in the oral health of both groups.

“Comparison of Short-Term Oral Impacts Experienced by Patients Treated with Invisalign or Conventional Fixed Orthodontic Appliances”

By Saitah Alajmi, Arwa Shaban and Rashed Al-Azemi

- ❖ Observational retrospective study on 60 adults on the benefits of wearing thermoplastic clear aligners rather than conventional fixed orthodontic appliances-braces.
- ❖ Authors conducted the study due to the many factors that come when trying to choose between clear aligners and conventional appliances.
- ❖ Before this study it was known that it was easier for patients to maintain their oral health with the clear aligners due to the ability of removing them while eating or brushing their teeth; while patients using conventional treatment suffered from pain and discomfort.
- ❖ Authors aim was to compare and contrast the differences between the two different appliances in regards to the patients' day to day routine, oral symptoms, treatment satisfaction and also pain and use of analgesics.
- ❖ Two groups were formed. Both groups had 30 participants. First group wearing clear aligners, second group wearing braces
- ❖ The study was over a period of time of 1 month. The researchers evaluated the benefits and disadvantages of both clear aligners and conventional orthodontic treatment based on participants' self-reports through the surveys provided by the researchers.

“Comparison of Short-Term Oral Impacts Experienced by Patients Treated with Invisalign or Conventional Fixed Orthodontic Appliances”

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Results and Conclusions

- At the end of the experiment, researchers found that there are no significant differences between the 2 groups in regards to limitations of daily routine, to limitations and disturbances in eating, or oral symptoms such as pain and mucosal ulceration.
- The difference in pain was insignificant, but the patients with conventional treatment reported a higher use of analgesics.
- The researchers concluded that there were significant differences in the age distribution, stating that older people are seeking a more esthetic option which might have affected patients experience with the treatment and can be considered a “confounding” factor

- Researchers suggest that more studies based on patients' reports should be done on a long-term basis.



Importance for Patients



- It is important for patients to understand the *increase in biofilm and calculus accumulation* when deciding on orthodontic treatment
 - There will need to be an increase in oral hygiene home care to prevent accumulation and long term problems once treatments is over
- Although most of our results came back statistically insignificant → it was important to compare the OH of each of the available appliances
 - The patient may now choose orthodontic appliances best suited for their personal needs
 - Comfort and invisibility of **clear aligners** but increased responsibility of daily use
 - Permanence and no need to focus on wear of **self-ligated or elastomeric brackets**
 - *Ease vs. difficulty* when brushing/flossing



Importance for Dental Hygiene Professionals

- The DH professional is better able to recommend an orthodontic treatment ***based on oral hygiene needs and abilities***
 - **NOT** misalignment needs, but still important
- Understanding the increased rate of accumulation of biofilm and plaque because of the orthodontic appliances
 - Able to provide more tailored oral hygiene instructions for the orthodontic patient
 - Know what to expect clinically from the average orthodontic patient in terms of plaque and gingival indices, and bleeding on probing

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Works Cited