



CFAO GRADUATE STUDENT POSTERBOARD ABSTRACTS

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Volumetric assessment of tooth root resorption following the use of photobiomodulation during orthodontic treatment with clear aligners: A pilot study using CBCT

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INTRODUCTION:

Photobiomodulation therapy has been linked to enhanced orthodontic tooth movement, which may also be contributing to an increase in orthodontically induced inflammatory root resorption (OIIRR). The aim of this study is to evaluate the change in root volume using cone-beam computed tomography (CBCT) in a group of orthodontic patients treated with clear aligners who had received adjunctive photobiomodulation therapy with the OrthoPulse® device.

METHODS:

A semi-automated CBCT segmentation technique was used to obtain the pre-treatment and post-treatment tooth volume of 120 maxillary and mandibular anterior teeth in 10 consecutively treated patients who received comprehensive orthodontic treatment with clear aligners, underwent adjunctive photobiomodulation therapy (OrthoPulse® device) and changed aligners every 3-5 days. The individual teeth were superimposed, and the crowns were removed at the level of the cemento-enamel junction. The change in root volume between the two timepoints was then assessed.

RESULTS:

When all maxillary and mandibular anterior teeth were considered jointly, no statistically significant OIIRR (change in root volume) was detected using the pre-treatment and post-treatment CBCT imaging ($p = 0.65$).

CONCLUSIONS:

Clear aligner patients who changed their aligners every 3-5 days and used adjunctive photobiomodulation therapy may not experience clinically relevant OIIRR. Due to the small sample size limitation, the presented results should be interpreted with caution.