

OP36 THE EFFECTS OF LOW-LEVEL LASER THERAPY ON ORTHODONTIC ROOT RESORPTION AND PAIN MANAGEMENT: A PILOT STUDY

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**AIMS:** To evaluate the effect of low-level laser therapy (LLLT) on the extent of root resorption and pain after orthodontic force application. This is also the first study to measure the amount of laser energy transmitted to the tooth socket.

**SUBJECTS AND METHOD:** In this prospective randomized split-mouth trial, 20 patients were randomly allocated to the laser and sham laser side. The maxillary first premolars were loaded with a 150 g buccal tipping force. The laser regimen was applied on day 1, 2, 3, 4, 7, 14 and 21 on four points on the buccal and four points on the palatal mucosa of the experimental premolar. Sham-laser was also applied in the same regimen on the control premolar. On day 28, the premolars were extracted and root surface analysis was performed with microcomputed tomography. A visual analogue scale evaluating pain was employed on days 1, 2, 3, 4, 7, 14 and 21 of the experimental period to compare the effect of LLLT on orthodontic pain. After premolar extraction, an ammeter was placed inside the tooth socket to measure laser transmission.

**RESULTS:** LLLT significantly reduced total root-resorption by 23 per cent compared to the sham-laser ( $P = 0.026$ ). LLLT tended to reduce orthodontic pain compared to the sham-laser. The result of the laser transmission study found that for each extra millimeter of bone there was an extra 6.81 per cent loss in laser transmission (with standard error 0.87).

**CONCLUSION:** LLLT is effective at reducing root resorption and pain associated with orthodontic force application. Additionally, the thickness of bone affects the amount of laser energy transferred to the tooth.