

UNIVERSITI TEKNOLOGI MARA

**AN EVALUATION OF THE
EFFECTIVENESS BETWEEN
STAINLESS STEEL MINI-IMPLANTS
AND
TITANIUM ALLOY MINI-IMPLANTS:
A RANDOMISED CLINICAL TRIAL**

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ABSTRACT

The application of temporary anchorage devices such as mini-implants or mini-screws and mini-plates are gradually accepted in orthodontics as methods to reinforce anchorage. Although titanium alloy (TiA) mini-implants are well-known for their biocompatible behaviour in comparison to stainless steel (SS) mini-implants, only several studies are found to be investigating the clinical aspects of SS mini-implants. This research aims; 1) to measure and compare the rate of anchorage loss between SS and TiA mini-implants, 2) to measure and compare the rate of upper labial retraction between SS and TiA mini-implants, 3) to compare the discomfort experience between SS and TiA mini-implants. This research is comprised of twenty-seven patients (12 males: 15 females; mean age 23.7 + 5.25 years) obtained from Universiti Teknologi MARA postgraduate clinic. All subjects underwent extraction of upper first premolars and had maximum reinforcement of anchorage. The subjects were randomized into two groups, TiA group and SS group. Following alignment and levelling, with a working archwire of 0.019 x 0.025"-inch stainless steel, 1.6 mm in diameter and 8 mm in length of mini-implants were placed between the first molar and the second premolar in the maxilla. Four weeks after placement, the mini-implants were loaded with 150 gm retraction force with Nickel-Titanium closed coil spring. Oral health-related quality of life (OHRQoL) questionnaires were completed and study casts were collected prior to retraction (T0), at month 1 (T1), month 3 (T2) and month 6 (T3). The casts were then digitized using Viewbox version 4.0. The data were analysed using ANOVA, SPSS version 22. There was no statistically significant difference of anchorage loss of maxillary molar, 0.63 mm with SS mini-implants, 0.54 mm with TiA mini-implants ($p= 0.360$) and retraction of labial segment; 4.49 mm with SS mini-implants and 4.91 mm with TiA mini-implant ($p=0.114$). Nevertheless, the total mean score of OHIP-14 gradually reduced over time, there is significant difference between SS and TiA group at T1. The results of the study suggested that there was no statistically significant difference of anchorage loss between stainless steel mini-implant and titanium alloy mini-implant clinically. Both mini-implants are equally comparable in term of clinical performance in upper labial segment. Patient experience discomfort at level of occasionally then gradually reduce the discomfort level in both groups.

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