

INTISARI

PRAHAR SARI DYAH KUSUMAWARDANI

**PERBANDINGAN *UNLOADING FORCE* KAWAT NIKEL-TITANIUM
(NiTi) SUPERELASTIS *POLYMER COATED* DAN *EPOXY RESIN
COATED* (Kajian *In vitro*)**

Kawat nikel-titanium memiliki sifat *shape memory effect* dan elastisitas tinggi. Kawat nikel-titanium cocok digunakan pada tahap awal perawatan ortodonti dengan peranti cekat sebab meskipun diberi defleksi besar namun menghasilkan kekuatan relatif kecil. Permintaan terhadap kawat estetik meningkat seiring dengan meningkatnya jumlah pasien dewasa yang melakukan perawatan ortodonti. Daya lenting dilihat ketika kawat busur mengalami deformasi elastis, kawat akan menyimpan energi yang akan dilepaskan ketika proses *unloading* (*unloading force*) yang merepresentasikan energi yang tersimpan pada kawat untuk menggerakkan gigi saat proses deaktivasi. Tujuan dari penelitian ini adalah membandingkan *unloading force* kawat nikel-titanium superelastis *polymer coated* berdiameter 0,017 inci, kawat nikel-titanium superelastis *epoxy resin coated* berdiameter 0,016 inci, dan kawat nikel-titanium superelastis berdiameter 0,016 inci pada defleksi 2, 3, dan 4 mm. Jenis penelitian ini adalah eksperimental laboratoris menggunakan 24 sampel dibagi dalam tiga kelompok untuk uji *three point bending* menggunakan *universal testing machine*. Kelompok 1 adalah kawat nikel-titanium superelastis *polymer coated* dengan diameter 0,017 inci, kelompok 2 adalah kawat nikel-titanium superelastis *epoxy resin coated* dengan diameter 0,016 inci, dan kelompok 3 adalah kawat nikel-titanium superelastis dengan diameter 0,016 inci. Hasil penelitian dianalisis dengan uji *one way ANOVA* dan *post hoc LSD* dengan nilai $p < 0,05$. Hasil menunjukkan bahwa rerata nilai *unloading force* kelompok 1 lebih rendah dibandingkan dengan kelompok 2 pada defleksi 2, 3, dan 4 mm serta nilai *unloading force* terbesar yaitu pada saat defleksi 4 mm pada seluruh kelompok. Simpulan penelitian ini terdapat perbedaan *unloading force* kelompok 1 dan 2 pada defleksi 2, 3, dan 4 mm.

Kata kunci : *Unloading force, kawat nikel-titanium superelastis polymer coated, kawat nikel-titanium superelastis epoxy resin coated*
Kepustakaan : 40 (1995-2017)

ABSTRACT

PRAHAR SARI DYAH KUSUMAWARDANI

COMPARISON OF UNLOADING FORCE BETWEEN POLYMER COATED AND EPOXY RESIN COATED SUPERELASTIC NICKEL-TITANIUM (NiTi) ARCHWIRE (*In vitro* Study)

Nickel-titanium archwire has shape memory effect and high elasticity properties. Nickel-titanium archwire is appropriate to use in early stage of orthodontic treatment because it can release light force eventhough it is given large deflection. The demand of esthetic archwire increases along with the increasing amount of adult patient with orthodontic treatment. Resilience can be seen when archwire performs elastic deformation, it will store energy which will be released through unloading process (unloading force) which represents the stored energy in archwire to move teeth while deactivation process. The aim of this study was to compare unloading force between polymer coated superelastic nickel-titanium archwire 0,017 inch, epoxy resin coated superelastic nickel-titanium archwire 0,016 inch, and superelastic nickel-titanium archwire 0,016 inch at 2, 3, and 4 mm deflection. This research was an experimental laboratory with 24 samples which were divided into three groups with three point bending test using universal testing machine. Group 1 is polymer coated superelastic nickel-titanium archwire 0,017 inch, group 2 is epoxy resin coated superelastic nickel-titanium archwire 0,016 inch, and group 3 is superelastic nickel-titanium archwire 0,016 inch. The results were analyzed with one way ANOVA test and post hoc LSD with $p < 0,05$. The results showed that the mean unloading force of group 1 was lower than group 2 at 2, 3, and 4 mm deflection and the largest unloading force was at 4 mm deflection for all groups. The conclusion of this research was there is difference of unloading force between group 1 and 2 at 2, 3, and 4 mm deflection.

Keywords : *Unloading force, polymer coated superelastic nickel-titanium archwire, epoxy resin coated superelastic nickel-titanium archwire*

Bibliography : 40 (1995-2017)