

INTISARI

Perawatan ortodonti sering kali melibatkan pencabutan gigi premolar, yang membutuhkan penutupan ruang pencabutan melalui retraksi gigi kaninus. Penutupan ruang pada perawatan ortodonti cekat teknik *straightwire* secara umum menggunakan mekanisme *sliding* dengan *open coil spring*. *Open coil spring* terbuat dari logam *stainless steel* (SS) dan *nickel titanium* (NiTi). Pergerakan gigi menyebabkan proses remodeling tulang yang melibatkan osteoblas dan osteoklas pada sisi tertarik dan tertekan. Tujuan dari penelitian adalah untuk mempelajari pengaruh jenis bahan *open coil spring* dan lama retraksi terhadap aktivitas alkalin fosfatase cairan krevikuler gingiva pada retraksi kaninus pada sisi tertarik dan tertekan.

Subjek penelitian terdiri dari 4 pasien ortodonti RSGM Prof. Soedomo dengan kasus pencabutan premolar kanan dan kiri rahang atas yang telah menyelesaikan tahap *levelling* dan *aligning*. Gigi kaninus rahang atas pada satu sisi diretraksi menggunakan SS *open coil spring* dan gigi kaninus pada sisi seberangnya diretraksi menggunakan NiTi *open coil spring*. Sampel cairan krevikuler gingiva diambil pada sisi tertarik (mesial) dan tertekan (distal) gigi kaninus hari ke-0, 7, 14 dan 21 setelah gaya diaplikasikan. Aktivitas ALP diukur dengan spektrofotometer panjang gelombang 405nm. Hasil dianalisis dengan uji statistik anava tiga jalur untuk mengetahui perbedaan rerata aktivitas ALP antara retraksi menggunakan SS dan NiTi *open coil spring* sisi tertarik dan tertekan pada masing-masing waktu pengamatan.

Hasil penelitian menunjukkan perbedaan bermakna antara kelompok SS dan NiTi pada hari ke-14 dan 21 dan tidak terdapat perbedaan bermakna antara sisi tertarik dan tertekan. Aktivitas ALP cairan krevikuler gingiva setelah retraksi gigi kaninus menggunakan *stainless steel open coil spring* lebih besar daripada menggunakan NiTi *open coil spring*.

Kata kunci : alkalin fosfatase, *stainless steel open coil spring*, *nickle titanium open coil spring*, retraksi kaninus, sisi tertarik, sisi tertekan.

ABSTRACT

Orthodontic treatment were often involve premolar tooth extraction and closure of the extraction space through canine retraction. The retraction on straightwire technique is generally done using a sliding mechanism with open coil spring. Open coil spring made from stainless steel (SS) alloy and nickel titanium (NiTi) alloy. Osteoblast and osteoclast play important role during bone remodeling that occurred in both tension site and compression site. The aim of this study is to find the effect of the materials of coil spring and the length of retraction to the alkaline phosphatase (ALP) activity in the gingival crevicular fluid (GCF) during canine tooth retraction on the tension site and compression side.

Four ortodontic patients from RSGM Prof. Soedomo with extraction of the first upper premolar in the right and left side and had finished levelling and aligning stage. An upper canine of each patient was retracted using SS open coil spring and the contralateral canine was retracted using NiTi open coil spring. GCF samples were collected from the tension (mesial) and compression (distal) side of the canine at 0, 7, 14 and 21 days after. ALP activity was then measure using spectrophotometric analysis with 405nm wavelength. The result were analyzed by three way anova statistic to see the mean and difference of the ALP activity between canine retraction using SS and NiTi open coil spring in tension and compression side in each time observation.

Significant difference result showed that between SS and NiTi at 14 and 21 days and there is no significant difference at tension and compression side. ALP activity increased on the canine retraction using SS open coil spring than NiTi open coil spring.

Keyword: alkaline phosphatase, stainless steel open coil spring, nickel titanium open coil spring, canine retraction, compression side, tension side.