



## **PENGARUH KONTINUITAS DAN ORIENTASI SERAT SUTRA SEBAGAI INTI PASAK TERHADAP KETAHANAN FRAKTUR GIGI**

### **INTISARI**

Pita serat digunakan sebagai bahan pasak pada gigi tetap karena bentuknya yang elastis dan tidak diperlukan pembesaran dari saluran akar. Terdapat berbagai jenis serat yang mempengaruhi kekuatan dan daya dukung beban sistem. Penelitian ini bertujuan untuk mengevaluasi pengaruh kontinuitas dan orientasi serat sutra sebagai inti pasak terhadap ketahanan fraktur gigi.

Empat puluh gigi premolar rahang bawah pasca pencabutan bebas karies dan berukuran rata-rata panjang akar sama dievaluasi keretakannya menggunakan transluminasi kemudian dibersihkan dan dipotong bagian koronal. Preparasi dan obturasi saluran pasak dilakukan dengan ukuran 9 mm. Spesimen penelitian dibagi dalam 4 kelompok, yaitu kelompok Ia direstorasi dengan serat sutra *unidirectional* kontinu, kelompok Ib dengan serat sutra *unidirectional* diskontinu, kelompok IIa serat sutra *braided* kontinu, kelompok IIb serat sutra *braided* diskontinu. Setelah dilakukan penyimpanan dalam inkubator pada suhu 37°C selama 24 jam, dilakukan uji ketahanan fraktur menggunakan *universal testing machine* dalam satuan *Newton* (N). Analisis data menggunakan uji ANAVA dua jalur ( $\alpha=0,05$ ) dan uji *Post Hoc Tukey* ( $\alpha=0,05$ ).

Kesimpulan pada penelitian adalah bahwa orientasi serat sutra *braided* mempunyai ketahanan fraktur lebih tinggi daripada *unidirectional*, pita kontinu mempunyai ketahanan fraktur lebih tinggi dibanding pita diskontinu dan terdapat interaksi kontinuitas dan orientasi serat sebagai pasak terhadap ketahanan fraktur gigi, dimana orientasi serat *braided* kontinu mempunyai ketahanan fraktur paling tinggi.

Kata kunci : kontinuitas, orientasi, serat sutra, *unidirectional*, *braided*, ketahanan fraktur.



## **THE EFFECT OF CONTINUITY AND RELATIONSHIP OF SILK FIBER AS A POST CORE ON THE FRACTURE RESISTANCE OF TOOTH**

### **ABSTRACT**

Fiber ribbon is commonly employed as a post material in permanent teeth due to its elastic structure and the absence of necessity for root canal enlargement. The load-bearing capacity and strength of the system are influenced by different fiber types. The main aim of this study is to evaluate the effect of the continuity and orientation of silk fibers as post cores on the fracture resistance of teeth.

Transillumination was used to assess the fissures of forty caries-free mandibular premolar teeth, all exhibiting an equal average root length. The teeth were subsequently cleaned and coronally sectioned. Obturation and post-canal preparation were conducted with a 9 mm diameter. The research specimens were categorized into four groups: group Ia, restored with continuous ribbon unidirectional silk fiber; group Ib, restored with discontinuous ribbon unidirectional silk fiber; group IIa, restored with continuous ribbon braided silk fiber; group IIb, restored with discontinuous ribbon braided silk fiber. Following a 24-hour incubation at 37°C, universal testing apparatus was employed to conduct a fracture resistance assessment quantified in Newtons (N). A two-way ANOVA ( $\alpha = 0.05$ ) and a Tukey Post Hoc test ( $\alpha = 0.05$ ) were employed for data analysis.

The study concludes that braided silk fiber orientation exhibits superior fracture resistance compared to unidirectional fibers, continuous tape demonstrates greater fracture resistance than discontinuous tape, and there exists an interaction between continuity and fiber orientation affecting tooth fracture resistance, with continuous braided fiber orientation yielding the highest fracture resistance.

**Keywords:** continuity, orientation, silk fiber, unidirectional, braided, fracture resistance.