

# Kekuatan Tarik Diametral Semen Ionomer Kaca Shofu FX Ultra Setelah Perendaman Di Dalam Larutan Saliva Buatan = Diametral Tensile Strength of Shofu FX Ultra Glass Ionomer Cement After Being Immersed in Artificial Saliva Solution

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## Abstrak

Latar Belakang: Atraumatic Restorative Treatment atau perawatan restoratif atraumatik adalah teknik perawatan minimal invasif untuk merestorasi gigi dengan menggunakan instrumentasi tangan. Material yang dapat digunakan untuk perawatan restoratif atraumatik adalah semen ionomer kaca. Baru-baru ini, beredar di pasaran Indonesia semen ionomer kaca Shofu FX Ultra yang diklaim dapat digunakan untuk ART. Dalam rongga mulut, restorasi semen ionomer kaca mengalami gaya mastikasi dan terpapar saliva. Belum ada penelitian mengenai pengaruh perendaman didalam larutan saliva buatan terhadap kekuatan tarik diametral semen ionomer kaca Shofu FX Ultra. Tujuan: Mengetahui pengaruh lama perendaman didalam larutan saliva buatan terhadap kekuatan tarik diametral Shofu FX Ultra. Metode: Pembuatan 36 spesimen semen ionomer kaca Shofu FX Ultra mengikuti standar ISO 9917-1/2007 dibagi ke dalam 6 kelompok perlakuan perendaman yaitu didalam larutan saliva buatan pH 7 dan pH 4,5 masing-masing didiamkan selama 1, 7, 14 hari dalam inkubator 37° C. Nilai kekuatan tarik diametral diuji dengan alat Shimadzu Universal Testing Machine. Analisis data dengan uji statistik One Way Anova dan uji Independent Sample T-test. Hasil: Rerata nilai kekuatan tarik diametral setelah perendaman pada kelompok perlakuan perendaman pH 7 dengan lama perendaman (1, 7, dan 14 hari secara berurutan) yaitu sebesar 6,40±0,45 MPa, 5,39±0,45 MPa, dan 5,30±0,46 MPa. Rerata nilai kekuatan tarik diametral setelah perendaman pada kelompok perlakuan perendaman pH 4,5 dengan lama perendaman (1, 7, dan 14 hari secara berurutan) yaitu sebesar 4,83±0,54 MPa, 4,54±0,36 MPa, dan 3,51±0,39 MPa. Rerata kekuatan tarik diametral semen ionomer kaca yang direndam dalam larutan saliva buatan pH 7 dan pH 4,5 terdapat perbedaan bermakna secara statistik ( $p<0,05$ ). Rerata kekuatan tarik diametral semen ionomer kaca antara pH 7 dengan pH 4,5 pada lama perendaman 1 hari, 7 hari, dan 14 hari terdapat perbedaan bermakna secara statistik ( $p<0,05$ ). Nilai kekuatan tarik diametral setiap kelompok terdapat perbedaan bermakna, kecuali pada kelompok perendaman saliva buatan pH 7 antara lama perendaman 7 dan 14 hari serta perendaman saliva buatan pH 4,5 antara lama perendaman 1 dan 7 hari. Kesimpulan: Nilai kekuatan tarik diametral semen ionomer kaca Shofu FX Ultra lebih besar pada perendaman didalam larutan saliva buatan pH 7 daripada pH 4,5. Semakin lama perendaman, nilai kekuatan tarik diametral semen ionomer kaca Shofu FX Ultra semakin menurun.

.....Background: Atraumatic Restorative Treatment is a minimally invasive treatment technique to restore teeth using hand instrumentation. The material that can be used for atraumatic restorative treatment is glass ionomer cement. Recently, glass ionomer cement Shofu FX Ultra has been around in the Indonesian market and is claimed to be used for ART. In the oral cavity, the glass ionomer cement restoration is exposed to masticatory forces and saliva. There has been no research on the effect of immersion in artificial saliva solution on the diametral tensile strength of Shofu FX Ultra glass ionomer cement. Objective: To determine the effect of immersion time in artificial saliva solution on the diametral tensile strength of Shofu FX Ultra. Methods: Preparation of 36 specimens of Shofu FX Ultra glass ionomer cement according to the ISO 9917-

1/2007 standard was divided into 6 groups by immersion treatment, namely in artificial saliva solution pH 7 and pH 4.5, each of which was left for 1, 7, and 14 days in incubator 37° C. The diametral tensile strength values were tested using the Shimadzu Universal Testing Machine. Data analysis with One Way ANOVA statistical test and Independent Sample T-test. Results: The mean diametral tensile strength values after immersion in the pH 7 immersion treatment group with long immersion (1, 7, and 14 days respectively) were  $6.40 \pm 0.45$  MPa,  $5.39 \pm 0.45$  MPa, and  $5.30 \pm 0.46$  MPa. The mean values of diametral tensile strength after immersion in the immersion treatment group pH 4.5 with long immersion (1, 7, and 14 days respectively) were  $4.83 \pm 0.54$  MPa,  $4.54 \pm 0.36$  MPa, and  $3.51 \pm 0.39$  MPa. The mean diametral tensile strength of glass ionomer cement between pH 7 and pH 4.5 at immersion time of 1 day, 7 days, and 14 days showed statistically significant differences ( $p < 0.05$ ). There was a significant difference in the diametral tensile strength values of each group, except for the artificial saliva immersion pH 7 group between 7 and 14 days and the artificial saliva immersion pH 4.5 between 1 day and 7 days. Conclusion: The diametral tensile strength value of Shofu FX Ultra glass ionomer cement was greater when soaked in an artificial saliva solution pH 7 than pH 4.5. The longer the immersion, the value of the diametral tensile strength of Shofu FX Ultra glass ionomer cement decreased.