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4-META를 함유한 연성 이장재의 비귀금속 합금에 대한 접착성과 점탄성에 관한 연구



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The purposes of this study were comparing the bond strength between base metal alloy used for the cast denture bases and PMMA soft liner modified with 4-META, and describing the pattern of debonding and material property change in wet environment like the intraoral situation.

This study consisted of four experiments:

1. The in vitro measurement of shear bond strength of adhesive soft liner
2. The in vitro measurement of shear bond strength of the adhesive soft liner after 2 weeks of aging
3. A comparison of debonding patterns
4. An evaluation the gelation time of modified soft liner.

The soft liner used in this study was commercially available as Coe-soft (GC America, IL., USA), which is provided in forms of powder and liquid. This is a PMMA soft liner commonly used in dental clinics. The metal primer used in this study was 4-META containing primer packed in Meta fast denture base resin (Sun Medical Co., Osaka., Japan).

The specimens were formed in a single lap joint design, which is useful for evaluating the apparent shear bond strength of adhesively bonded metal plate by tensile loading.

Using the 20 0mm transparent grid, percent area of adhesive soft liner remaining on the shear area was calculated to classify the debonding patterns.

To evaluate the change of the initial flow of the modified adhesive soft liner, the gelation time was measured with an oscillating rheometer (Haake RS150W/TC50, Haake Co., Germany). It was a stress control and parallel plate type with the diameter of 35mm.

Within the conditions and limitations of this study, the following conclusions were drawn as follows.

Results:

1. There was significant increase of bond strength in the 5% 4-META, 10% 4-META containing groups and in the primer coated groups versus the control group ($P < 0.05$).

Oral Presentation

2. After 2 weeks of aging, no significant increase in bond strength was found except for the group containing 10% 4-META ($P < 0.05$).
3. The gelation times of the modified soft liner were 9.3 minutes for the 5% 4-META containing liner and 11.5 minutes for a 10% 4-META liner.
4. The debonding patterns of the 4-META containing group after 2 weeks of aging were similar to those of immediately after preparation, but the debonding pattern of the primer group showed more adhesive failure after 2 weeks of aging.