OⅡ-8

The effect of long-term water storage on microleakage and water stability of dentin bonding luting systems

최선영*, 이선형
(서울대학교 치과대학 보철학교실)

I.PURPOSES

Recently, resin cements have been become more widely used and have been accepted as prominent luting cements and crowns cemented with current resin cement exhibit less microleakage than those cemented with conventional luting cement. But, the constant contact with water and the exposure to occlusal force increased microleakage in resin cements inevitably. Especially, to overcome some of the problems associated with the hydrophobic nature of bonding resins, most recent bondingresin molecules have been modified to contain a hydrophilic resin such as 2-hydroxyethylmethacrylate(HEMA). But, By virtue of these modifications, bonding resins absorb a significant amount of water. And there may also be significant stresses placed at the tooth-bonding resin-resin based composite interfaces, which may adversely affect longevity of restorations. So the reinforcement of water stability of resin cement are indispensable in the future study.

This study was conducted to determine the influence of water storage on microleakage of two resin cements to dentin over the period of 6 months.

II.MATERIALS AND METHODS

The 32 extracted human teeth were tested for microleakage of single full veneer crown. Two resin cements with different components and adhesive properties Panavia F (Kuraray Co., Osaka, Japan) and Super-Bond C&B(Sun Medical Co., Kyoto, Japan)- were investigated. The storage environment was the saline solution changed every one week for 1month, 3 months, and 6months. One group was also tested at 1 day as a control.

At the end of storage period, all the specimens of each group were exposed to thermocycling from 5C and to 55C for 500 cycles and to 50000 cycles of chewing simulation, and stained with 50% silver nitrate solution. The linearpenetration of microleakage was measured by use of a metallurgical microscope at x100 magnification and a digital traveling micrometer with and accuracy of 3 ㎛.

Values were analyzed using two-way ANOVA, Duncan's multiple range test (DMRT) and Least significant difference test(LSDT).

III. RESULTS

1. Statistically significant differences in microleakage were shown in 3 months storage group in both systems ($p<0.05$).
2. There were statistically significant differences in microleakage between group C (3months group) and group D(6months group) in both systems ($p<0.05$).
3. In the course of increasing of microleakage for 3months, two systems showed the different tendency. In Panavia F, from the early stage of storage to 3 months, microleakage was increased slowly throughout the periods. In Super-Bond C&B, there was no significant increase of microleakage for 1 month storage, and from 1 month to 3 months, there was statistically significant increase of microleakage.
4. In the comparison of mean microleakage for each period, there were statistically significant differences for group C and group D. In group C, microleakage of Super-Bond C&B was significantly greater than that of Panavia F. Otherwise, in group D, microleakage of Panavia F was significantly greater than that of Super-Bond C&B($p<0.01$).