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## Orthodontic resin under water immersion

Ching Liang Meng, DDS, DMSc, FICD; Wei Nan Wang, DDS;<sup>a</sup> Tien Hsiang Tarn, DDS, MD; Young Ching Luo, DDS; Jye Shin Lai, DDS; Michael G Arvystas, DMD

<sup>a</sup>8, Section 3, Ting-Chow Road, Department of Dentistry, Tri-Service General Hospital, Taipei, Taiwan, 100, R.O.C

### ABSTRACT

The absorption and desorption of water by a polymer matrix of composite orthodontic resin could cause debonding of the filler-matrix or hydrolytic degradation of fillers and loss of bond strength. In this study, the bond strength of brackets directly bonded with orthodontic composite to the enamel surface of premolars was measured with an Instron machine; the debonding interface distribution was analyzed by scanning electron microscope and energy dispersive x-ray spectrometry following water immersion for 1, 2, and 3 days, and 1, 2, 4, 8, 16, 24, and 32 weeks, respectively. The results show that, under water immersion, bond strength may gradually weaken over time. The greatest loss occurs initially, followed by a period of relative stabilization, and then a weaker reduction after 24 weeks. The greater the time in water immersion, the less the bond strength and the greater the destruction of the composite resin. The debonding interface occurs between bracket and resin.

Ching Liang. Meng, DDS, DMSc, FICD, Deputy Director, Institute of Preventive Medicine, National Defense Medical Center. Associate Professor, School of Dentistry, National Defense Medical Center

Wei Nan. Wang, DDS, Head, Orthodontic and Pedodontic Section, Department of Dentistry, Tri-Service General Hospital. Associate Professor, School of Dentistry, National Defense Medical Center

Tien Hsiang. Tarn, DDS, MD, Attending Dr., Orthodontic and Pedodontic Section, Department of Dentistry, Tri-Service General Hospital. Instructor, School of Dentistry, National Defense Medical Center

Young Ching. Luo, DDS, Resident, Orthodontic and Pedodontic Section, Department of Dentistry, Tri-Service General Hospital. Assistant, School of Dentistry, National Defense Medical Center

Jye Shin. Lai, DDS, Rotating Resident, Department of Dentistry, Tri-Service General Hospital

Michael G. Arvystas, DMD, Professor of Orthodontics, University of Medicine and Dentistry of New Jersey, New Jersey Dental School, Newark, N. J., Visiting Professor of Dentistry, Albert Einstein College of Medicine, and Orthodontist, Center for Craniofacial Disorders, Montefiore Medical Center, Bronx, NY

**KEY WORDS:** Bond strength, Debonding interface, Orthodontic resin, Water immersion.

