

Direct and indirect bonding of wire retainers to bovine enamel using three resin systems: shear bond strength comparisons

Tae-Yub Kwon, DDS, MSD, PhD,^a Hu Meina, DDS, MSD,^b Joana Antoszewska, DDS, PhD, MDS^c,
Hyo-Sang Park, DDS, MSD, PhD^d

Objective: We compared the shear bond strength (SBS) of lingual retainers bonded to bovine enamel with three different resins using direct and indirect methods. **Methods:** Both ends of pre-fabricated twisted ligature wires were bonded to bovine enamel surfaces using Light-Core, Tetric N-Flow, or Transbond XT. Phosphoric acid-etched enamel surfaces were primed with One-Step prior to bonding with Light-Core or Tetric N-Flow. Transbond XT primer was used prior to bonding with Transbond XT. After 24 hours in water at 37°C, we performed SBS tests on the samples. We also assigned adhesive remnant index (ARI) scores after debonding and predicted the clinical performance of materials and bonding techniques from Weibull analyses. **Results:** Direct bonding produced significantly higher SBS values than indirect bonding for all materials. The SBS for Light-Core was significantly higher than that for Tetric N-Flow, and there was no significant difference between the direct bonding SBS of Transbond XT and that of Light-Core. Weibull analysis indicated Light-Core performed better than other indirectly bonded resins. **Conclusions:** When the SBS of a wire retainer is of primary concern, direct bonding methods are superior to indirect bonding methods. Light-Core may perform better than Transbond XT or Tetric N-Flow when bonded indirectly. (Korean J Orthod 2011;41(6):447-453)

Key words: Lingual bonded retainer, Shear bond strength, Direct and indirect bonding

INTRODUCTION

Relapses following orthodontic treatment are unpredictable.^{1,2} Research into these relapses has frequently centered on the lower anterior teeth segment, where re-

lapses most often occur.³ While lingual bonded retainers are considered to be the most suitable method of retention, the effectiveness of this method is still controversial.⁴ Recent research suggests that long-term retention of the lower anterior segment may be necessary in order to prevent or reduce unwanted post-treatment changes.⁵

Fixed lingual multistrand retainers have long been available as a method of orthodontic retention⁶ and a number of different designs and techniques for bonding having been suggested.^{7,8} This type of retainer allows physiologic tooth movement while maintaining tooth alignment.⁶

There are two primary approaches to bonding fixed lingual retainers: direct bonding and indirect bonding. Compared with direct bonding, indirect bonding of these retainers requires less chair time, etched surfaces

^aAssociate Professor, Department of Dental Biomaterials, School of Dentistry, Kyungpook National University.

^bPostgraduate Student, ^cProfessor and Clinical Director, Department of Orthodontics, School of Dentistry, Kyungpook National University.

^dProfessor, Department of Dentofacial Orthopedics and Orthodontics, Wrocław Medical University.

Corresponding author: **Hyo-Sang Park.**

Department of Orthodontics, School of Dentistry, Kyungpook National University, 50 Samdeok-dong 2-ga, Jung-gu, Daegu 700-412, Korea.

+82 53 600 7373; e-mail, parkhs@knu.ac.kr.

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