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Evaluation of a novel fixed-space maintainer made of light-cured acrylic resin: An *in vitro* study

Yasser R Souror
Al-Azhar University, Egypt

Statement of the Problem: Untimely loss of primary molars may produce teeth movement, leading to loss of space and arch deficiency.1 Following this, space loss could produce or exaggerate existing malocclusions, such as crowding, ectopic eruption, extreme both overjet and overbite, and opposed molar contacts.2 The amount of space loss in the mandible is greater than that lost in the maxilla next to the lost primary tooth.3,4 However, after premature loss of the primary second molar in the early mixed dentition stage, the space loss has been reported to be very large in either maxilla or mandible.

Methodology & Theoretical Orientation: To evaluate a fixed-space maintainer made of light-cure acrylic resin (LCAR) for its flexural and shear bond strength using different bonding systems to the enamel. 45 extracted primary teeth were selected. They were randomly divided into three equal groups (n=15) along with the type of adhesive system (Tetric Flow, Transbond XT, and Fuji Ortho LC) used for bonding (LCAR) to the tooth surface. Surfaces were treated; LCAR was attached to the treated surfaces using a split Teflon mold. For flexural strength testing, ten bars of LCAR were made using another Teflon-split mold. Shear bond strength and mean flexural strength values were evaluated by a universal testing machine.

Conclusion & Significance: The highest values of bond strength were recorded for Transbond XT, followed by Tetric Flow, whilethe lowest values were for Fuji Ortho LC. Various groups had a significant difference as investigated by ANOVA. ARI scores showed no significant difference in debond sites. Mean value and standard deviation of flexural strength for LCAR were 82.83 ± 5.2. LCAR has superior mechanical properties and could be an alternative to currently-in-use space maintainer though *in vivo* and *in vitro* trials are needed to progress the ultimate design of LCAR.

Recent Publication

1. Fawaz Pullishery, Hajer Ayed Alhejoury, Mohammed Turkistani, Yasser Refay SourorIs Zinc Oxide Eugenol Cement Still Impeding the Use of Resin□based Restoration? A Systematic Review, Dentistry and Medical Research, Volume 9, Issue 2, July-December 2021.

2. Ahmed S Waly, Yasser R Souror, Salah A Yousief, Waleed M S Alqahtani , Mohamed I El-Anwar, Pediatric Stainless-Steel Crown Cementation Finite Element Study, European Journal of Dentistry Eur J Dent. 2021 Feb;15(1):77-83.

3. Ahmed Mohamed Elmarakby, Mahmoud Darwish, Yasser R. Souror, Ahmed Waly, Surface Roughness of Bulk Fill Composite after Simulated Toothbrushing with Different Dentifrices Open Access Macedonian Journal of Medical Sciences 8(D):166-172 (2020).

Biography

Yasser R Souror believes that teaching is not only to deliver knowledge and skills to the students but also to teach them a sound scientific way of thinking that enables them to develop independent scientific opinions. He spent more than 13 years helping students to build up their career by providing lectures and developing their clinical skills and professional values, as well as establishing assessments in Pediatric Dentistry. He obtained a B.Sc., a master's degree, and a doctorate from Al-Azhar University from 2004 to 2015. He also hired as a consultant of Pediatric Dentistry in governmental and private hospitals in Egypt.

doctoryaser@gmail.com