

ABSTRACT

Aim:

To compare and evaluate clinical failure rates of metal brackets bonded with two different light cure composite resin materials activated using LED light cure unit. The two adhesives compared in this study are Transbond XT and Bracepaste.

Materials and Methods:

- All participants included in the study were informed in prior about the study and were eligible for undergoing fixed orthodontic treatment.
- Using a rotary instrument with a rubber cup or bristle, the surfaces to be bonded were cleaned using slurry of pumice for 10 seconds, rinsed thoroughly with water for 20 seconds and air dried completely using an airway syringe.
- The teeth were isolated using cheek retractors, tongue away and cotton rolls.
- Bonding was done between second premolar to second premolar on both arches. The molars were banded with preformed bands.
- The teeth to be bonded were acid etched using 37% phosphoric acid for 30 seconds. After thorough washing, the teeth were completely air dried. A frosty appearance of enamel is noticeably seen evenly on the tooth surface.

- A bonding agent was applied using a micro brush and light cured using a 3M Elipar light cure unit for 20 seconds.
- With a split mouth design being used, each of the participating patient's dentition is divided into four quadrants. The quadrants were switched opposite each other with different combinations in all patients to avoid any operator bias. The operator was not informed of the different composite used in the quadrants.
- The brackets were bonded in appropriate positions and the excessive adhesive material were removed using a straight probe and the brackets were light cured using 3M ELIPAR light cure unit for 10 seconds in all directions mesial, distal, gingival, occlusal or incisal aspects of the bracket

After bonding of brackets, a minimum of 10 minutes is provided before placement of the initial arch wire.

Results:

Transbond XT adhesive exhibited higher failures than Bracepaste adhesive material, however, the number of failures were statistically insignificant (p value > 0.05). The posterior region displayed statistically significant higher number of failures than anterior region. Similarly, males and NiTi wires displayed statistically significant higher failure of brackets (p value < 0.05) than their corresponding counterparts. In this study, the mandibular

arch, patients above 18 years and the left quadrant, though displaying higher rate of failures than their counterparts did not show a statistical significance.

Transbond XT displayed a statistically significant, higher number of failures in mandible while Bracepaste, though insignificant, displayed higher failure rates in maxilla. Transbond XT displayed higher failure rates in patients above 18 years and on the right quadrant, while Bracepaste displayed vice versa of the same. The ARI scores depicted a predominance of 5 according to Bishara and Truelove classification denoting higher failures at the enamel adhesive interface.

Conclusion:

It can be safely assumed in this study, that the efficiency of the two adhesive materials is optimal to be used in practice. Necessary care should be taken into consideration to follow ideal protocols in allied procedures and techniques such as isolation, etching, curing etc.

Key words: *Bracket Failure, Failure Rates, Transbond XT, ARI Index,*

In-Vivo Study, Bonding.