FLEXURAL STRENGTH OF PREIMPREGNATED FIBER REINFORCED COMPOSITE BARS SIMULATING FIXED PARITAL DENTURES

Mohamed Abdelmageed Awad, * and Abdulhamaid Abdullah Maghrabi**

ABSTRACT

The fiber-reinforced composite (FRC) systems produced for constructing fixed restorations which are available in the market are Sculpture Plus / FiberKor (Jeneric / Pentron) and Targis / Vectris (Ivoclar).

Objectives: To determine the flexural strength of preimpregnated FRC bars simulating fixed restorations in vitro using different thickness and different span. lengths and examine them under the scanning electron microscope (SEM).

Method: In this study rectangular bars with different thickness were constructed from these two systems according to the manufacturer's· instructions. Flexural load of these bars was obtained by subjecting them to 3-point loading. Tests were performed in different experimental designs using special jigs and flexural strength was then calculated. Data was statistically analyzed using one way analysis of variance (ANOY A). Some fractured bars were examined under SEM.

Results & Conclusions: It was found that increase the amount of fibers does not increase the flexural strength; however in some cases the flexural strength was reduced. When the bars had the same amount of fibers, increasing the distance between the supports would increase the flexutal strength which the bars can withstand before fracture in most cases. The SEM evaluation of the bars after flexural strength testing, showed that, for the Sculpture plus / Fiberkor specimens there was effective wetting and coupling of the fiber bundles by the resin confirmed by absence of gaps between them. The failure occurred usually away from the fiber-matrix interface. However for Targis / Vectris rods, there were gaps between the fiber bundles and the resin indicating poor wetting.

* Associate Professor, Restorative Department, Faculty of Dentistry, Tanta University, Tanta, Egypt and Fixed Prosthodontic Divi sion, Faculty of Dentistry, King Abdulaziz University, Jeddah, Saudi Arabria.

**Assistant Professor, Oral & Maxillofacial Rehabilitation Department, Faculty of Dentistry, King Abdulaziz University, Jeddah, Saudi Arabria.