

**B.Vascu, C.Mocanu, G.Pancu, Cl.Topoliceanu, T.Hamburda, St.Lacatusu**  
**SEM STUDY: SHEAR BOND STRENGTH AT INTERFACE BETWEEN**  
**FIBERGLASS-REINFORCED SPLINT SYSTEM AND DENTAL**  
**SURFACE FOR PERIODONTALLY COMPROMISED TEETH**

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**Abstract:**

This study assessed, through scanning electron microscopy (SEM), the behaviour of adhesive systems used for bonding fiberglass-reinforced splint system to enamel surfaces of periodontally compromised anterior teeth. Scanning electron microscopy (SEM) observations of the fracture behaviour, shear bond strength and interfacial morphology were performed initially, after 7 days and after 6 months. SEM illustrations revealed various degrees of intermingling between the adhesive material and dental enamel. The best results were performed by Admira Bond system, followed by Scotchbond system. The lowest shear bond strength were assessed for Te Econom system, with high leakage values between dental surface and adhesive resin. Fiber-reinforced splint systems bonded with adhesive and composite resins can be used with good results instead of classical splint systems, especially in frontal areas.

**Key words:**

fiberglass-reinforced splint system, shear bond strength, adhesive systems

**Introduction**

Fiber-reinforced splint systems are used in direct intra-oral applications as periodontal splints by bonding them to etched enamel with resin adhesives and composites. Though there are a few studies (1, 2, 3, 4), the data regarding the effect of adhesives systems on the shear bond strength of fiber-reinforced systems to etched enamel are very limited.

This study assessed, through scanning electron microscopy (SEM), the behaviour of adhesive systems used for bonding fiber-reinforced splint system to enamel surfaces of periodontally compromised anterior teeth.

**Materials and methods**

The fiber-reinforced splint system FIBER SPLINT MULTI-LAYER was applied on 21 freshly extracted anterior mobile teeth. The enamel surfaces were treated with either Te-Econom (Vivadent)- group 1 (7 specimens), Adper (Scotchbond)- group 2 (7 specimens), Admira (Bond-Voco)-group 3 (7 specimens). The splint was covered with Composit flow Charisma, accordingly to producer specifications. The specimens were immersed for 6 months in different pH mediums (Afnor saliva- 8,1 pH; lactic acid solution- 2,56 pH; citric acid solution- 4,03 pH). Scanning electron microscopy (SEM) observations of the fracture behaviour, shear bond strength and interfacial morphology were performed initially, after 7 days and after 6 months.

**Results and discussions**

SEM illustrations revealed various degrees of intermingling between the adhesive material and dental enamel. The conditioned enamel surfaces were morphologically varied according to adhesive system and time interval.

The interfacial morphology on SEM images after 7 days show no modifications of interface between splint and dental surfaces for splints bonded

with Admira Bond and Scotchbond. SEM images show that the highest shear bond strength after 6 months is characteristic for splints bonded with Admira Bond, followed by Scotchbond. Even 7 days splints bonded with Te Econom show marked degradation of interfacial between enamel surface and composite resin,

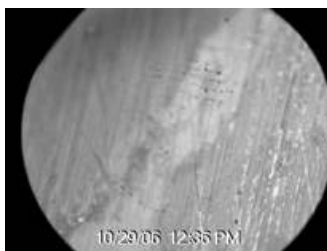


Fig. 1. Specimens initial aspect

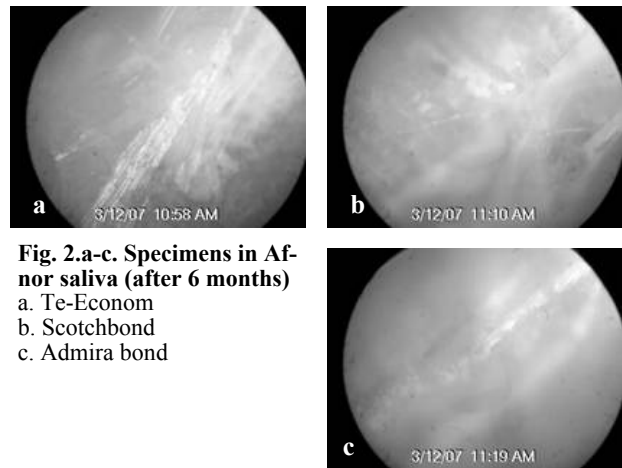
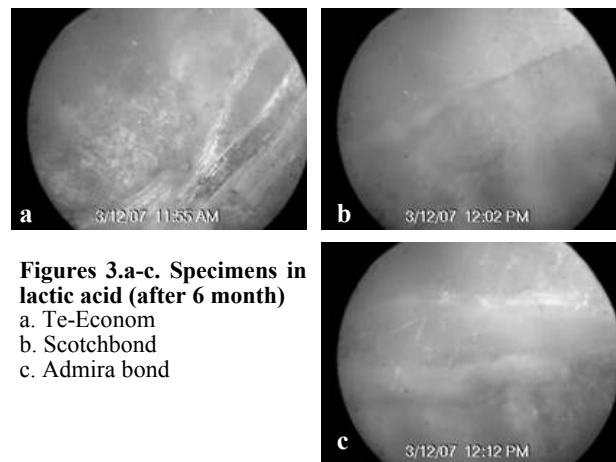


Fig. 2.a-c. Specimens in Afnor saliva (after 6 months)  
 a. Te-Econom  
 b. Scotchbond  
 c. Admira bond

with fibers-splint exposure and high microleakages between dental surface and Te Econom adhesive. After 6 months the lowest shear bond strength were assessed for Te Econom system, with high leakage values between dental surface and adhesive resin. Fiber-reinforced splint systems bonded with adhesive present good stability of the bonding systems in pH acid mediums. The adhesive systems with good results for fiber-reinforced splints contention are Admira Bond and Scotchbond. Fiber-reinforced splint systems bonded with adhesive and composite resins can be used with good results instead of classical splint systems, especially in frontal areas. The development of synthetic dental materials has allowed

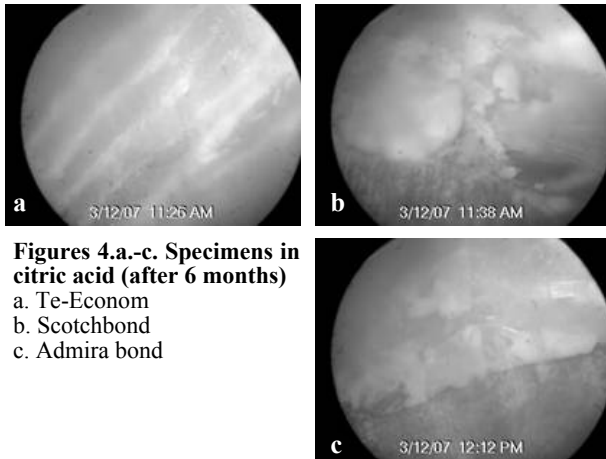


Figures 3.a-c. Specimens in lactic acid (after 6 month)  
 a. Te-Econom  
 b. Scotchbond  
 c. Admira bond

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**Figures 4.a.-c. Specimens in citric acid (after 6 months)**  
 a. Te-Econom  
 b. Scotchbond  
 c. Admira bond

the incorporation of fiber-reinforced materials to replace metal splints. These contemporary materials provide in-

creased flexural strength, as well as improved aesthetic.

#### Conclusions

Internal fiber-reinforced composite splinting being affordable for the patient, easy for the clinician to construct and giving good esthetic and functional results, suggests that the method may be a valuable aid in periodontal treatment.

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**V.Vascu, C.Mocanu, G.Pancu, Cl.Topoliceanu, T.Hamburda, St.Lacatusu**  
**ЭКСПЕРИМЕНТАЛЬНЫЕ ИССЛЕДОВАНИЯ ТРЁХ АДГЕЗИВНЫХ СИСТЕМ ИСПОЛЬЗУЕМЫХ ДЛЯ ИМОБИЛИЗАЦИИ ЗУБОВ ПРИ ПАРОДОНТАЛЬНЫХ ЗАБОЛЕВАНИЯХ**

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#### Аннотация:

*В этой работе исследуются с помощью электронной микроскопии три адгезивные системы для фиксации временных шин из стекло-волокна (fiberglass-reinforced splint system), используемых для имобилизации передних зубов в пародонтальных заболеваниях. Электронно-микроскопические изображения показывают значительные различия в качестве адгезии в зависимости от типа адгезивной системы и от прошедшего времени. Самые лучшие результаты показали система Admira Bond и Scotchbond, а самый слабый Te Eсonom. Результаты работы демонстрируют, что этот метод имобилизации который используется для фиксации композит и адгезивные системы можно использовать с успехом в пародонтологии для имобилизации небольших размеров и при высоких эстетических требованиях.*

#### Ключевые слова:

*имобилизация, стекло-волокно, адгезивные система*

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**M.Vataman, L.Aminov, M.Moscalu, G.Pancu**  
**INVESTIGATIONS REGARDING THE PRESENCE OF PULP MINERALIZATIONS AT DIFFERENT AGES**

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#### Abstract:

*The aim of this study was to make a comparative evaluation regarding the frequency of the pulp stones appearance in two groups of patients : a young group, between 18-35 years old, and a second one, aged between 60-80 years old. The analysis was made considering the action in time of the irritating factors upon some of the teeth, who developed irreversible pulpo-dentinal changes. The results obtained after the clinical , radiographic and histological exams led to a statistic evaluation which allowed the differentiation between the two groups of age, pointing out the characteristics of each one .*

#### Key words:

*pulp tissue, mineralization, pulp stones*

#### Introduction.

It is well known the fact that the dental pulp can be affected by many intern or extern factors that are capable of causing certain injuries, more or less severe, depending on their aggressive internal or external action upon the pulp tissue.

One of the ways pulp reacts to these stimuli can consist in the apparition of mineralization processes under different forms. They can range from the tertiary or reaction dentin, the diffuse calcifications along the blood vessels or connec-

tive fibers, to the formation of the big, voluminous concentrations of minerals that constitute the pulp stones or the denticles. The apparition of such phenomenon takes place slowly, in time, and is not accompanied by obvious symptoms, aspect which makes them difficult to be discovered. The only way they are likely to be detected is the histological exam, or, if they are voluminous enough, the radiological exam.

The ethyology of pulp calcifications is yet unknown [2,7] but there are some theories which claim that the prolonged action of some irritative factors on the pulp tissue would generate obvious mineralization reactions in some fragments of the pulp. For this reason, it is believed that this phenomenon is a specific feature of the old age [12]. This aspect is

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