

ORIGINAL ARTICLE

Comparison In vitro of Compressive Strength and Tensile two Luting Cements and Resin Xeno Cem-Plus and Glass Ionomer Fujil

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ABSTRACT

The importance of the constant replacement of lost tooth structure has long been considered and why the study of how different factors in the success of this treatment seems necessary. Compressive strength of the study is too experimentally, as a useful tool for evaluation of laboratory studies before clinical use is Luting. And the tensile strength is In vitro. Because in vitro studies are appropriate for this assessment. The compressive strength of the study, samples of cement made according to the standard and for strength, full metal crowns on teeth extracted human maxillary premolars were carved for this purpose. The number of samples in the compressive strength and tensile strength is 14 samples, 20 samples. Data by nonparametric Mann-Whitney test were evaluated. Variables studied cement GI, cement Xeno cem-plus, compressive strength and tensile strength. The mean compressive strength of samples of different groups is based on non-parametric Mann-Whitney test in Table 1 below. TOP 208.77 MPa is compressive strength measured and related to GI and the lowest is 14.91 MPa Xeno cem-plus groups. The compressive strength of cement Xeno cem-plus test was significantly higher than the GI cements ($0.05 > p$). The mean tensile strength of samples of different groups based on non-parametric Mann-Whitney test is given in Table 2. The highest tensile strength of 21.1 MPa measured and related to the Group Xeno cem-plus and low GI group is 2.82 MPa. Statistical analysis was performed according to the tensile strength of cement Xeno cem-plus significantly higher than the GI cements ($0.05 > p$).

Keywords: *In vitro, Resin Xeno Cem-Plus and Glass Ionomer Fujil*

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INTRODUCTION

The importance of the constant replacement of lost tooth structure has long been considered and why the study of how different factors in the success of this treatment seems necessary. However, proper preparation is primarily important for the retention of sufficient strength but we can say. Tabs prosthesis success depends heavily on the cementation although dental cements and this has limited the use of quantitative the main component of dental materials, are in clinical use. Because nowadays a wide range of different products to choose different commercial companies are required considering the advantages and disadvantages of each idea Altrin dentist to achieve the desired goal of choices.

Among the commonly used cement, Aynur ionomer (GI) with good adhesion and the release of fluoride is widely used clinically [1] but undesirable features such as hardening of the slow, fragile, sensitive to moisture and to establish the sensitivity of the pulp, has felt the need to achieve better products. [2] The resin cements with features such as high fracture strength, good bond with the dentin and dental alloys,

lack of solubility in oral Mayat marginal leakage of interest were low [3] Xeno cem-plus cement in recent years claiming to be a desirable feature of the dual cured, fluoride release, high physical strength, sealing higher in the absence of oxygen (for example, under the cover) no need for etching and bonding, easy to use and affordable to the consumer market are presented. With respect to the claims listed can be considered a step in introducing more desirable for clinical applications in this study, we found that the tensile strength and thrust both cements luting GI Fuji 1 Xeno cem-plus and compared with each other.

Dental cement for indirect restorations paste is applied to the teeth, luting the name. The main role of bridging the gap dental cements Luting and restoration are divided into two categories: permanent and temporary [4] Luting factors into three categories based on the structure of aqueous (water based), with base oil (oil based) and the base resin (resin based) are divided water-based cements with a hard gel process and their acidic environment, the band did not stick to the teeth or very weak connection with their but it is easy to use, some free fluoride and usually a relatively low layer thickness. When adhesives and leveling cements, firmly attached to the tooth structure is established. Some products in this group are monomers or primers that bind to the metal alloys and ceramics are possible. This group is generally better mechanical properties than the other two groups, but the high sensitivity of the technique. Oil-based cements are used primarily for temporary restorations, most of which contain eugenol, but some do not. The cement layer thicknesses and higher mechanical properties are lower than permanent cement [5].

HISTORY

study was to evaluate the tensile strength of coatings prepared by three different degrees of convergence and cemented with four cements did. The conventional cement ZP (Flecas) and GI (Ketack-Cem) and C & B Metaband Love resin and Panavia F were examined in this study. 120 freshly extracted human molars were divided into 12 groups. All samples were flat occlusal surface and 6 degrees of convergence (as a control), 12 and 24 in the preparation of the samples was studied. The crowns were made of high noble alloy. Samples were cemented according to the manufacturer's instructions. £ 28.10 recorded during the cementing force to sit for 10 minutes Raksh was better. C37 samples were stored in distilled water for seven days and then by Universal testing machine speed mm / min 0.5 were under tensile force. The results showed that the degree of convergence 6 and 24 Panavia F resin and resin C & B Metaband the degree of convergence of 12 have the highest tensile strength. Overall, the results indicate that the tensile strength of resin cements considerably higher than the other groups studied [1] In 2008 AL-Makramani BMA et al study to evaluate the effect on the compressive strength of all-ceramic crowns cemented Luting Turkom Cera did. Luting ZP (Elite), GI (Fuji 1) and dual-cured composite resin (panavia F) were examined in this study. Base metal alloy metal die Asandard maxillary first premolar under standard preparation had been made. The thickness of 6.0 mm to 30 all-ceramic copings were prepared and divided into three groups. Each group studied by the cement manufacturers' instructions was cemented. While cementing constant force of 5 kg was applied to the samples for 10 minutes. After 24 hrs, C 37 in water samples by Universal testing machine (Zwisk, Germany), speed mm / min 1 were loaded in compression.

The results showed significant differences in the compressive strength of the three groups and the group were cemented with Panavia F highest and Cement with Fuji I showed the lowest compressive strength. The results suggest that cement can be effective on the compressive strength of all-ceramic crowns [6]

MATERIALS AND METHOD

Compressive strength of the study is too experimentally, as a useful tool for evaluation of laboratory studies before clinical use is Luting. And the tensile strength is In vitro. Because in vitro studies are appropriate for this assessment. The compressive strength of the study, samples of cement made according to the standard and for strength, full metal crowns on teeth extracted human maxillary premolars were carved for this purpose. The number of samples in the compressive strength and tensile strength is 14 samples, 20 samples. Data by nonparametric Mann-Whitney test were evaluated. Variables studied cement GI, cement Xeno cem-plus, compressive strength and tensile strength.

RESULTS AND DISCUSSION

Compressive strength

The mean compressive strength of samples of different groups is based on non-parametric Mann-Whitney test in Table 1 below. TOP 208.77 MPa is compressive strength measured and related to GI and the lowest is 14.91 MPa Xeno cem-plus groups. The compressive strength of cement Xeno cem-plus test was significantly higher than the GI cements ($0.05 > p$).

Table 1 Compressive strength of the cements studied

Group	Number of samples	Average(Mpa)	Standard deviation	p-value	Significant level
GI	7	40/3814	18/12351	0/000	S*
Xeno Cem-plus	7	154/1929	41/4163		

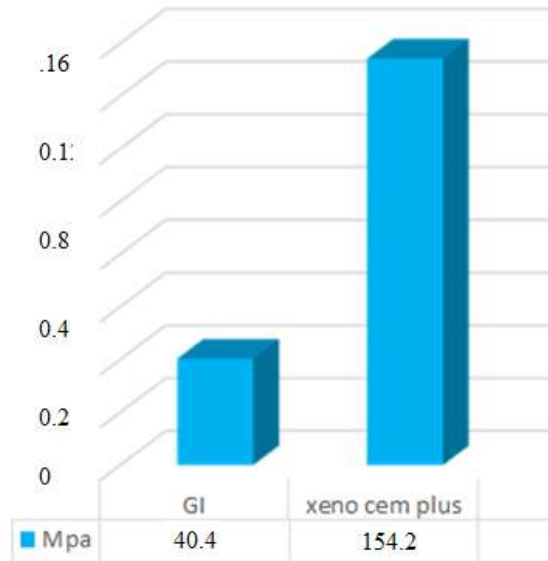


Fig. The mean compressive strength of the cement case

Tensile strength

The mean tensile strength of samples of different groups based on non-parametric Mann-Whitney test is given in Table 2. The highest tensile strength of 21.1 MPa measured and related to the Group Xeno cem-plus and low GI group is 2.82 MPa. Statistical analysis was performed according to the tensile strength of cement Xeno cem-plus significantly higher than the GI cements (0.05> p).

Table 2 Tensile strength of the cements studied

Group	Number of samples	Average(Mpa)	Standard deviation	p-value	Significant level
GI	10	6/8950	2/37432	0/000	S*
Xeno Cem-plus	10	17/4480	3/26661		

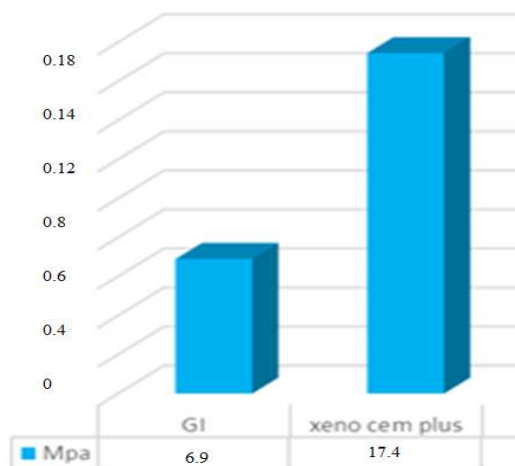


Fig Comparison of tensile strength cement types studied

CONCLUSION

In the absence of previous studies and the absence of appropriate criteria to evaluate the compressive strength of the crowns on natural teeth as the teeth of different age, different structures or different storage time after extraction, to compare the compressive strength of dental cements according to standard ADA96 for productive detachable (split mold) is made of stainless steel with height 0/1mm ±

6mm diameter 0/1mm \pm 4mm was built the only variable is studied cements. The results of the compressive strength of cement Xeno cem-plus GI cement is almost 4 times. In clinical conditions when the restoration is subjected to compressive forces, the cementum that has a high compressive strength is important. Under pressure forces the cemented restorations may lose their integrity and subsequent risk of marginal leakage, corrosion of the cladding and separation Restoration even. Due to the substantially higher compressive strength resin Xeno Cem-plus constant use can increase the success of treatment. To measure the tensile strength of the reality of the samples prepared under identical conditions to simulate In vivo, the samples were placed under thermocycling. After cementation by Universal testing machine samples were subjected to tensile force. The analysis results showed that the tensile strength of cement Golden Xeno Cem-plus nearly 3 times the GI cement. Golden cement production through hybrid layer is bonded to the structure. The hybrid layer is a layer of mediocrity by entering, publishing and Polymerize cement foundation created in ivory. Consani stating that the higher the strength of resin cements can draw the connection mechanism is different.

REFERENCES

1. Zidan O, Ferguson GC. The retention of complete crowns prepared with three different tapers and luted with four different cements. *J Prosthet Dent* 2003; 89(6): 565-571.
2. Wang Y, Darvell BW. Failure behavior of glass ionomer cement under Hertzian indentation. *Dental Materials* 2008; 24: 1223-1229.
3. Fonseca RG, Dos santos CA. Comparison of tensile bond strengths of cast metal crowns luted with resin cements. *J oral Rehabil* 2004; 31(11): 1080-1084.
4. Hill EE. Dental cements for Definitive Luting: A Review and Practical Clinical Consideration. *J Dent Clin N Am* 2007, 51:643-658.
5. Powers M.J, Sakaguchi R.L: Crag's Restorative dental materials. 12th ed chapter 20 p:480-500, USA, 2006, Mosby.
6. Al-Makramani BMA, Razak AA, Abu-Hassan MI. Effect of luting cements on the compressive strength of Turkom-Cera all ceramic copings. *J Contemp Dent Prac* 2008; 9(2): 33-40.