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Comparison of the Flexural Strength of Four Core Built up Materials

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Abstract

The aim of this study is to compare the flexural strength of 4 commonly used core build up materials in clinics. Four core built up materials, a cermet cement (ketac silver), a light cure composite, conventional silver amalgam (control group) and zirconomer (zirconia reinforced GIC) were used and were divided into Group A, B and C and D respectively. The root canal of 90 extracted mandibular molars with similar anatomy and morphology were selected. Highest flexural strength was shown by Group A followed by group C, group B and then group D.

Keywords:- Flexural strength, core build up.

INTRODUCTION

Core build up is a restoration that is placed in a grossly destructed tooth so as to restore bulk of the coronal structure. It should have good strength so as to aid in the retention of the definitive restoration.[1]

The flexural strength of core built up material is one of the most important factors for success of prosthesis.

The various core built up materials include

1) Silver amalgam
2) Reinforced G.I.C
3) Light cure composite
4) Zirconomer (zirconia reinforced GIC).

Core built up is generally done in grossly decayed tooth. With the development of new materials like metal modified GIC (miracle mix, zirconia reinforced GIC and bulk composites) the treatment options have considerably improved.

The commercially available reinforced GIC are Ketac Molar, GC 9, zirconomer. The commercially available composites include Kerr, Ivoclar, Densply. All these composites are

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excellent materials for core build up of grossly destructed tooth.

The aim of this study is to compare the flexural strength of 4 commonly used core build up materials in clinics.

MATERIAL AND METHODS

Four core built up materials, a cermet cement (ketac silver), a light cure composite and conventional silver amalgam (taken as control group) and zirconomer were used. The root canal of 90 extracted mandibular molars with similar anatomy and morphology were selected. The teeth were divided in to four groups, Group A restored with Silver amalgam, Group B Restored with light cure composite, Group C restored with reinforced Glass ionomer and Group D restored with zirconomer (zirconia reinforced GIC). The samples were tested using universal testing machine (UTM) to measure flexural strength of all samples.

RESULTS

The Group A filled with conventional Silver amalgam showed average flexural strength of 505mpa, Group B restored with light cure composite material showed average flexural strength of 485mpa. Group C Restored with reinforced GIC showed average flexural strength of 492Mpa and Group D restored with zirconomer showed average flexural strength of 460mpa.

The results showed that conventional silver amalgams has the best flexural strength and is the material of choice for core built up in grossly decayed tooth. Light cure composites also show excellent results and are also the material of choice for core build up.

DISCUSSION

The aim of study was to determine flexural strength of various core build up materials. A core build up is a restoration placed to provide the foundation for a restoration that will endure the masticatory stress that occurs in the oral cavity for prolonged periods and to provide satisfactory strength and resistance to fracture before and after crown preparation.Nowadays with development of new materials like metal modified GIC, zirconia reinforced GIC and advanced

composites the treatment protocol have changed.[2] Metal modified GIC is also an excellent material with strength of over 600 MPA,[3] Generally 2 methods are used to prepare metal modified GIC. One is that silver alloy admixed Spherical amalgam alloy powder is mixed with type II GIC powder (miracle mix).[4]

Second is silver particles are bonded to glass particles which is called as cermet or ketac silver.

The bonding of particles is done at high temperature.[5] Cermet or ketac silver has better mechanical properties as core built up material as compared to admixed.[6]

CONCLUSIONS

Stronger materials provide better resistance to fracture and deformation and hence enhance the probability of clinical success.

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