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Radiographic assessment and comparison of GIC and Composite in Restoring Class I cavity in Primary Molars in children of 5-8 years of age: A Retrospective Study

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Abstract
Aim: Radiographic comparison and assessment of GIC and Composite in Restoring Class I cavity in Primary Molars in children.
Materials and Method: Data records of a total of 40 patients within the age group of 5 to 8 years were enrolled in which the primary molars were indicated for class I restoration. All the patients were broadly divided into two study groups as follows: Group A: Glass ionomer was used and Group B: Resin composite was used. As per data record files, complete respiration was done in all the patients. Follow-up visit records of all the patients were obtained. Radiographs were analyzed by skilled oral radiologists. Based on radiographic details, grading of the quality of restoration was done.
Results: On radiographic evaluation, it was seen that success occurred in 70 percent of the cases of Group A and 90 percent of the cases of Group B. On analyzing statistically, significant results were obtained.
Conclusion: Composite resin provided better results in comparison to glass ionomer cement in restoring deciduous molars.

Keywords: *Cavity, Composte, GIC, Resin*

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I. Introduction

The preservation of healthy teeth is one of the key health issues in childhood.[1] Dental Caries in primary dentition is still a challenging problem which requires special attention.[2] As we advanced into middle age or progress towards, the incidence of non carious cervical lesions increases.[3] For the restoration of these lesions, GIC and composite have been proved to be the material of choice.[4] GIC, presented in a variety of formulations designed for particular clinical indications, present unique opportunities to accomplish a variety of clinical objectives simultaneously.[5] These materials are capable to form satisfactory bonds with enamel and dentin, release fluoride over a prolonged period, promote good biological response (biocompatibility) and have a coefficient of thermal expansion close to that of tooth structures.[6] The glass used in glass carbomer contains strontium, and also high amounts of silicon, as well as a small amount of calcium. It is relatively high in silicon compared with the glasses used in the well-established brands of conventional glass-ionomer Fuji IX and Ketac Molar, but it contains comparable amounts of aluminium, phosphorus and fluoride. Resin composite material has become an alternative to amalgam due to its high esthetic property, minimal cavity preparation, and its clinical reliability.[7]

For children, these materials have offered an alternative that has insidiously become a "standard of care" in a variety of clinical indications for children.[8] Several factors alter its clinical performance and longevity; including its technique-sensitivity, polymerization shrinkage, and high coefficient of thermal shrinkage.[7]

Hence, the present study was conducted for radiographic assessment of glass ionomer compared to resin composite in restoring Class I cavity in primary molars.

II. Materials And Methods

The present study was conducted to analyze the radiographs for comparison of glass ionomer with resin composite in restoring Class I cavity primary molars. Data records of a total of 40 patients within the age group of 5 to 8 years were enrolled in which the primary molars were indicated for class I restoration. Complete demographic and clinical details of all the patients were obtained from the record files. Only those patients were included in which complete radiographic data was present. Bitewing radiographic details of all the patients during the selection procedure were recorded separately. All the patients were broadly divided into two study groups as follows:

Group A: Glass ionomer was used
Group B: Resin composite was used

Complete restoration was done in all the patients as per data records. Follow-up visit records of all the patients were obtained. Radiographs were analyzed by skilled oral radiologists. Based on radiographic details, grading of the quality of restoration was done. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test was used for evaluation of level of significance.

III. Results

In the present study, data of a total of 40 patients was enrolled. All the patients were divided into two study groups. In the Group A: Glass ionomer was used and in Group B: Resin composite was used.

Mean age of the patients of group A and group B was 6.9 years and 7.2 years respectively. There were 14 males and 6 females in group A and 12 males and 8 females in group B.

In the present study, on radiographic evaluation, it was seen that success occurred in 70 percent of the cases of Group A and 90 percent of the cases of Group B. On analyzing statistically, significant results were obtained.

IV. Discussion

Glass-ionomer cements belong to the class of materials known as acid-base cements. They are based on the product of reaction of weak polymeric acids with powdered glasses of basic character. Setting occurs in concentrated solutions in water and the final structure contains a substantial amount of unreacted glass which acts as filler to reinforce the set cement.[6,7] The term "glass-ionomer" was applied to them in the earliest publication, but is not strictly correct. The proper name for them, according to the International Organization for Standardization, ISO, is "glass polyalkenoate cement", but the term "glass-ionomer" (including the hyphen) is recognised as an acceptable trivial name, and is widely used within the dental profession.[9,10,11]

Conventional treatment using composite resin is still one of the most common approaches used in paediatric dental clinics. Despite the aesthetic quality, preservation of dental structure and abrasion wear rate similar to that of natural primary teeth, all composite resins suffer polymerisation shrinkage, which can jeopardise marginal integrity and restoration longevity. In addition, to take full advantage of the properties of composite resin, absolute isolation with rubber dam is necessary, making the restoration technique sensitive and time consuming and more traumatic for the paediatric patient.[7,9,10] Hence, the present study was conducted for radiographic assessment of glass ionomer compared to resin composite in restoring Class I cavity in primary molars.

In the present study, data of a total of 40 patients was enrolled. All the patients were divided into two study groups: Group A: Glass ionomer was used and Group B: Resin composite was used. Mean age of the patients of group A and group B was 6.9 years and 7.2 years respectively. There were 14 males and 6 females in group A and 12 males and 8 females in group B.

Hamie S et al compared the clinical performance of glass ionomer (GI) versus resin composite. A total of 40 Class I restorations were placed in 12 patients aged 4-8 year-old. Patients had to have one or more pair of contralateral teeth indicated for Class I restorations. The two materials, GI (ChemFil™ Rock) and resin composite (Z350) were randomly placed in a split mouth design. The restorations were evaluated using foreign direct investment criteria after 3, 6, 9, and 12 months. The result did not reflect any significant differences at the first 6 months evaluation. However, change appeared at 9 and 12 months evaluation regarding; anatomic form, fracture of material and retention, marginal adaptation, wear, proximal anatomical form, contact point, proximal contour, radiographic examination, recurrence of caries and periodontal response. Resin composite Z350 showed better clinical performance than ChemFil™ Rock after 1-year follow-up.[12]

In the present study, on radiographic evaluation, it was seen that success occurred in 70 percent of the cases of Group A and 90 percent of the cases of Group B. On analyzing statistically, significant results were obtained. Fuks AB et al accessed the clinical performance of two esthetic materials (Vitremer and Z100 +

Scotchbond Multipurpose) when used as Class I restorations in primary molars, and compare them to amalgam controls. A total of 102 restorations were placed in primary molars of 29 schoolchildren; 40 were of Vitremer, 38 of Z100 + Scotchbond Multipurpose, and 24 of amalgam (Dispersalloy). The restorations were evaluated clinically at baseline and after 6, 12, 18, 24 months, or until tooth exfoliation or patient drop-out, following the modified Cvar and Ryge criteria. Radiographs were taken at yearly intervals, and the radiograph of the last examination available was assessed and scored. The majority of the restorations examined clinically up to 18 months was good (Alpha according to Cvar and Ryge), and no statistically significant differences between the groups was observed. However, at the 19-24 months evaluation, Z100 rated better than Vitremer for surface appearance and color match. The prevalence of radiolucent defects at the cervical margin for the Z100 (47%) was significantly higher than for amalgam (11%) restorations (P = 0.002) and for Vitremer (13%) restorations (P = 0.008). The three materials evaluated (Vitremer, Z100 and Dispersalloy) presented satisfactory clinical performance during the time evaluated (approximately 2 years).[13]

V. Conclusion

It was concluded that composite resin provided better results in comparison to glass ionomer cement in restoring deciduous molars.

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Parameter		Group A	Group B
Age group (years)	5 to 6	12	10
	7 to 8	8	10
Gender	Males	14	12
	Females	6	8

Table 1: Age wise and Gender wise distribution

Ragiographic evaluation	Group A	Group B	p-value
Success	14	18	0.01 (Significant)
Failure	6	2	

Table 2: Radiographic evaluation

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