

COMPARISON OF THE RESULTS OF PIT AND FISSURE SEALING IN THE FIRST MOLAR MANDIBLE BY GLASS IONOMER CEMENT AND COMPOSITE IN AGE 6 - 8

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Abstract

Preventing tooth decay by pit and fissure sealing is an important procedure because of the morphology of the pits facilitates the formation of caries. Composite sealant Heliaseal F and GIC Fuji VII are two materials commonly used in pit and fissure sealing. The purpose of this study was to compare the results of pit and fissure sealing in the mandible first molars using Composite and GIC at ages 6-8 years after 3 months, and 6 months.

We collect 30 pediatric patients aged 6-8 years with 60 mandible molars were filled with Composite and GIC at the Pediatric Department of Ho Chi Minh City Dental Hospital. In particular, the teeth 36 is filled by Composite Heliaseal F and the teeth 46 is filled by GIC Fuji VII. Monitoring the retention of fillings and caries condition in the first molar mandible after 3 months and 6 months.

After 3 months, the rate of no caries for the Composite sealant and GIC were 93.3% and 96.7%, respectively; the proportion of cavities for the Composite sealant and GIC were 6.7% and 3.3%, respectively. After 6 months, this rate is not changed.

We conclude that the use of Composite sealant Heliaseal F or GIC Fuji VII material is not clinically different when selecting grooved sealants.

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Key words: pit and fissure sealants, Composite Heliaseal F, GIC Fuji VII.

1. Introduction

Over the decades, tooth decay is still the leading risk of dental diseases. Scientists are always striving to prevent the progression of tooth decay. However, the general rate of tooth decay in primary school age is quite high. Meanwhile, first molar has the role of performing the main chewing function, almost all of the child's chewing force will be put on this tooth. The loss of the first molar will leave many serious consequences for children later on, such as reduced chewing function, jaw dislocation, adversely affecting the temporal mandibular joint.

The methods to prevent tooth decay so far have always paid special attention to the position of the grooves in the chewing surface. In particular, filling in grooves has been safe and effective method in preventing and stopping the progression of caries [3]. Pit and fissure sealing is the filling of the holes and grooves on the chewing surfaces of the posterior permanent teeth with filler material. Pit and fissure sealing is a non-invasive method, filler act as a physical barrier, both helping to protect the tooth structure and preventing cavities.

The method of preventing cavities by sealing fissures is an important procedure because the morphology of the fissure creates favorable conditions for cavities to form, even if the patients have a balanced diet, make oral hygiene daily, use fluoride and regular have oral examination [4]. The concept of *pit and fissure sealing* today is very popular, no longer a new concept.

Among the current sealant materials, the two most commonly used materials are Composite sealant and Glass Ionomer Cement while Composite sealant Heliocel F and Glass Ionomer Cement Fuji VII are two most popular materials. The comparison of the use efficiency of the two above materials has had many studies in the world [2], [9]. However, we still want to conduct this study with the desire to compare the clinical results of these two materials for each group of subjects with different oral environments. Therefore, we carry out the topic: "Comparison the results of pit and fissure sealing in the first molar mandible by Glass Ionomer Cement and Composite in age 6-8" with goal: Comparing the caries condition in the first molar mandible filled by Glass Ionomer Cement and Composite sealant in age 6-8 after 3 months, 6 months.

2. Materials and Methods

2.1. Materials Research subjects

Including 30 children aged 6-8 with 60 first molars mandible receiving pit and fissure sealing treatment with Composite and GIC at the Pediatric Department of Ho Chi Minh City Dental Hospital. In which the teeth 36 were filling by

Composite Helioclear F and the teeth 46 were filling by GIC Fuji VII.

Inclusion criteria

- The first molars mandible had grown, without filling.
- The first molars mandible completely exposed chewing surface, not covered by gum tissue, healthy teeth, no signs of caries according to ICDAS standards (level 0) [8].
- Have the consent of the patient's relatives and patient cooperation well.

Exclusion criteria

- Children with systemic illness.
- Prehistory of severe allergy to fillings.
- The first molars mandible were injured affecting the anatomy of the chewing surface.

2.2. Method

Sampling method

- Choose the sample convenient, random without probability.
- Select 30 pediatric patients with 60 teeth, in which the teeth 36 gets filling by Composite Helioclear F, the teeth 46 gets filling by GIC Fuji VII.

Methods of implementation

- Record pediatric information.
- Conduct filling with Composite Helioclear F in the teeth 36 and GIC Fuji VII in the teeth 46 on the same pediatric patient.
- Periodic re-examination: Evaluating the condition of the cavities with the examination kit, where there is adequate light and meticulousness in the assessment.
- + Evaluate caries condition in teeth with sealants according to the ICDAS system (International Caries Detection and Assessment System) [8]:

0: Sound tooth surface.

1: First visual change in enamel: white or brown lesion (visible only after dry blasting or confined within the groove.

2: Distinct visual change in enamel: The tooth must be viewed wet. 3: Localized enamel breakdown due to caries with no visible dentin or underlying shadow.

4: An underlying dark shadow from dentin with or without localized enamel breakdown.

5: Distinct cavity with visible dentin.

6: Extensive distinct cavity with visible dentin.

Accordingly, no caries are equivalent to score 0, caries are equivalent to the remaining scores.

3. Statistical Analysis

The collected data were entered into a Microsoft Excel worksheet and analyzed using SPSS 20.0 for Windows (Stat. Soft Inc., Tulsa, USA). The difference in caries condition in the first molars mandible after 3 months and 6 months were tested using McNemar test Use the Fisher's Exact test to test the relationship between caries condition in 2 groups.

4. Results

Table 1. Evaluation the caries condition of Composite sealant in the teeth 36 after 3 months, 6 months (n = 30).

Time \ Result	No caries		Caries		p > 0,05
	n	Percent (%)	n	Percent (%)	
After 3 months	28	93,3	2	6,7	
After 6 months	28	93,3	2	6,7	

Table 2. Evaluation the caries condition of GIC sealant in the teeth 46 after 3 months, 6 months (n = 30).

Time \ Result	No caries		Caries		p > 0,05
	n	Percent (%)	n	Percent (%)	
After 3 months	29	96,7	1	3,3	
After 6 months	29	96,7	1	3,3	

Table 3. Comparing the caries condition between Composite sealant and GIC after 3 months, (n = 60).

Monitoring	No caries		Caries		p > 0,05
	n	Percent (%)	n	Percent (%)	
Composite sealant	28	93,3	2	6,7	
GIC	29	96,7	1	3,3	

5. Discussion

5.1. Evaluation the caries condition in 2 groups of materials after 3 months and 6 months Regarding the effectiveness of tooth decay prevention, the results from Table 1 showed that: The rate of no cavities and caries in the teeth 36 after 3 months and after 6 months of filling with Composite sealant was 93.3% and

Table 4. Comparing the caries condition between Composite sealant and GIC after 6 months, (n = 60).

Monitoring	No caries		Caries		p > 0,05
	n	Percent (%)	n	Percent (%)	
Composite sealant	28	93,3	2	6,7	
GIC	29	96,7	1	3,3	

6.7%, respectively. Our results of this study are consistent with the research results of the author Prathibha B. when conducting the filling pit and fissure sealant on the first molars of the lower jaw in 120 children aged 7-9 years: in resin-based fillings, 94.6% of teeth without cavities and 5.4% of teeth with cavities were followed after 12 months [7].

Resin-based filling placed on the surface of permanent molars are effective for preventing cavities in children and teenagers. One review found evidence that a resin furrow sealant reduced tooth decay by 11% to 51% compared with no sealant after 24 months. Similar benefits were seen after 48 months. There is insufficient evidence to rate the effectiveness of GIC fillings or the relative efficacy of other types of sealants. Information on adverse events is limited but no cases have been reported at present [1].

The results from Table 2. show that the rate of no caries and caries for the GIC fillings group was 96.7% and 3.3%, respectively, after both 3 months and 6 months. The results of this study are consistent with the study of Prathibha B. et al.: After 12 months, in the GIC fillings group, 91% of teeth have no caries and 9% of teeth have caries [7].

The results of our research from Table 1. and Table 2. are consistent with the research results of the above authors because these studies are conducted with the same type of filling materials and the same methods evaluation.

5.2. Comparison the caries condition in 2 groups of materials after 3 months and 6 months

The comparison results from table 3. and table 4. show that: the rate of caries when using Composite sealant and GIC is 6.7% and 3.3% after both 3 months and 6 months with $p > 0.05$. That mean, after 3 months and after 6 months, the rate of cavities in the group that was filled with Composite sealant is similar to the group that was filled with GIC. Our results are consistent with some studies of the following authors:

- Research results of author Ulusu T. et al. (2012) when having pit and fissure sealant for 173 children aged 7-15 years showed that: after 3 months, no tooth decay was detected for both groups material. After 6 months, the tooth decay rate for both groups of materials was 0.6%. After 1 year, the tooth decay rate for Fuji VII and Fissurit F was 2.0% and 3.3%, respectively. After 2

years, the rates were 3.4% and 4.8%, respectively. In the teeth with Helioclear F sealant, the ability to prevent tooth decay of the two above materials is not different and of clinical significance [9].

- According to research by the author Xiao xian CHEN and Xing gang LIU (2013) when filling the groove with Fuji VII and Concise for the first molars: after 2 years, the rate of caries in the group Fuji VII (6.3%) was higher in the Composite sealant group (2.1%). Fuji VII sealant exhibits similar cavities prevention effects to Concise in children with high and low risk of cavities, although Fuji VII retention is inferior to Concise for 2 years [10].

- Research by author Oba A.A. et al. (2009) showed that: After 3 years of filling pit and fissure sealant, the number of teeth appearing new deep holes is not much different between the group of GIC and resin sealant, only 6/56 of the teeth in the group filled with GIC and 8/81 of the teeth in the group filled with resin sealant showed signs of cavities [6].

- The research results of 2 authors Mickenautsch S. and Yengopal V. (2011) showed that: the results in general showed no difference between the decay prevention effect of GIC and resin sealant. in the groove filling [5]

The differences in research results are also explained by many reasons such as oral hygiene status or the clinical skills of the study participants. In addition to the factors of race, nutrition and water resources used by the child, the difference in age and sex of the subjects participating in the study also makes the results of the studies different. Different timing of observations and evaluations also contribute to discrepancies in results.

6. Conclusion

The use of Composite sealant Helioclear F or GIC Fuji VII material is not clinically different when selecting grooved sealants.

Conflict of Interest: No potential conflict of interest relevant to this article was reported.

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