

Original Research

Assessment of pit and fissure sealants retention using two different techniques

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ABSTRACT:

Background: The present study evaluated the retention of pit and fissure sealants using different techniques. **Materials & Methods:** We made 2 groups of 30 teeth each. In group I, mandibular permanent first molar of both sides were treated by acid etching alone and in group II, pretreated by with air abrasion was done followed by acid etching. All patients were clinically evaluated after 3 and 6 months of sealant placement and assessed as completely retained, partially retained and missing. **Results:** Out of 60 patients, males were 35 and females were 25. After 3 months, completely retained sealants was observed in 20 in group I and 16 in group II, partially in 8 in group I and 10 in group II and missing in 2 in group I and 4 in group II. The difference was non- significant ($P > 0.05$). After 6 months, sealants were completely present in 16 in group I and 13 in group II, partially in 10 in group I and 11 in group II and missing in 4 in group I and 6 in group II. The difference was non- significant ($P > 0.05$). **Conclusion:** Pit and fissure sealants are helpful in preventing dental caries, however, no difference in retention of pit and fissure sealants in either of technique was observed.

Key words: Acid etching, Pit and fissure sealants

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Introduction

Pit and fissure sealants are a safe and effective preventive treatment for caries. They help control caries by forming a physical barrier that prevents the metabolic exchange between fissure microorganisms and the oral environment. Therefore, the clinical success of fissure sealants is related to their retention rates and integrity.¹

According to National center for health statistics in USA the prevalence of dental caries increases with age, from 21% to 67% in adolescents with 90% of carious lesions found in occlusal surfaces of molars in children and young adults.²

Retention still remains the main determinant factor for success, where this is defined in terms of long lasting protection, absence of open margins, and sound enamel

of the occlusal surface.³ In other words, effectiveness and preventive ability is related to the complete retention of the material on the occlusal surfaces. Failure, on the other hand, is marked by an early loss, usually during the first year after application, mainly due to inadequate adhesion or by gradual failure of the sealant when exposed to wear. The statistics in the literature reveal a loss of 5-10% of sealant per year.⁴ Fissure sealing has been shown to be an evidence-based caries preventive method for protecting the occlusal surfaces against caries. Non- sealed teeth need to be restored approximately 50% more frequently compared to their sealed counterpart.⁵ The present study was conducted to assess the retention of pit and fissure sealants using different techniques.

Materials & Methods

The present study was conducted on 60 patients of both genders in the department of Endodontics. All patients were informed regarding the study and written consent was obtained. Ethical clearance was obtained from institutional ethical committee.

Data such as name, age, gender was recorded. We made 2 groups of 30 teeth each. In group I, mandibular

permanent first molar of both sides were treated by acid etching alone and in group II, pretreated by with air abrasion was done followed by acid etching. All patients were clinically evaluated after 3 and 6 months of sealant placement and assessed as completely retained, partially retained and missing. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 60		
Gender	Males	Females
Number	35	25

Table I shows that out of 60 patients, males were 35 and females were 25.

Table II Assessment of Sealant retention after 3 months

Sealant retention	Group I	Group II	P value
Completely	20	16	0.08
Partially	8	10	0.12
Missing	2	4	0.09

Table II, graph I shows that after 3 months, completely retained sealants was observed in 20 in group I and 16 in group II, partially in 8 in group I and 10 in group II and missing in 2 in group I and 4 in group II. The difference was non- significant (P> 0.05).

Graph I Assessment of sealant retention after 3 months

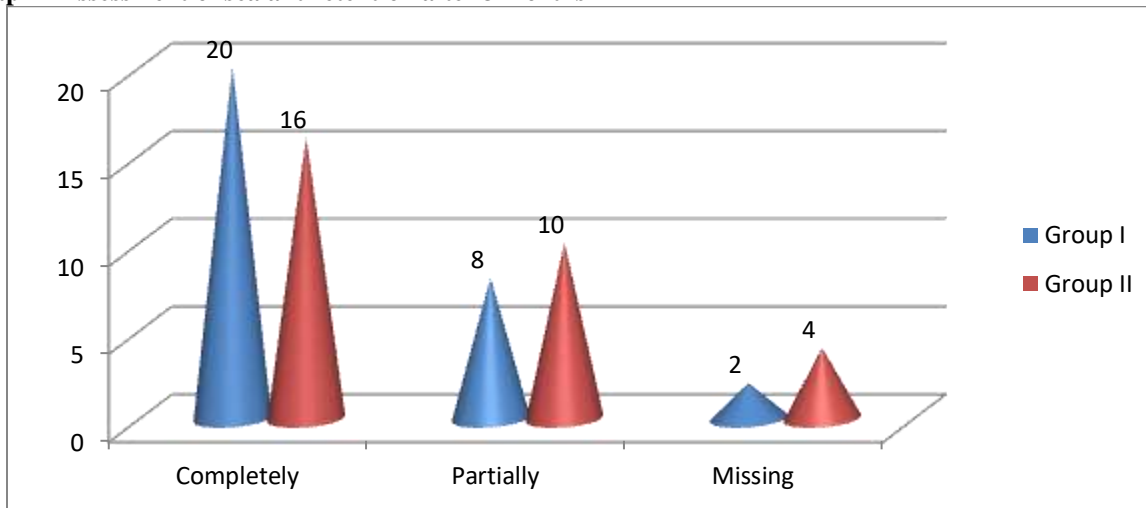
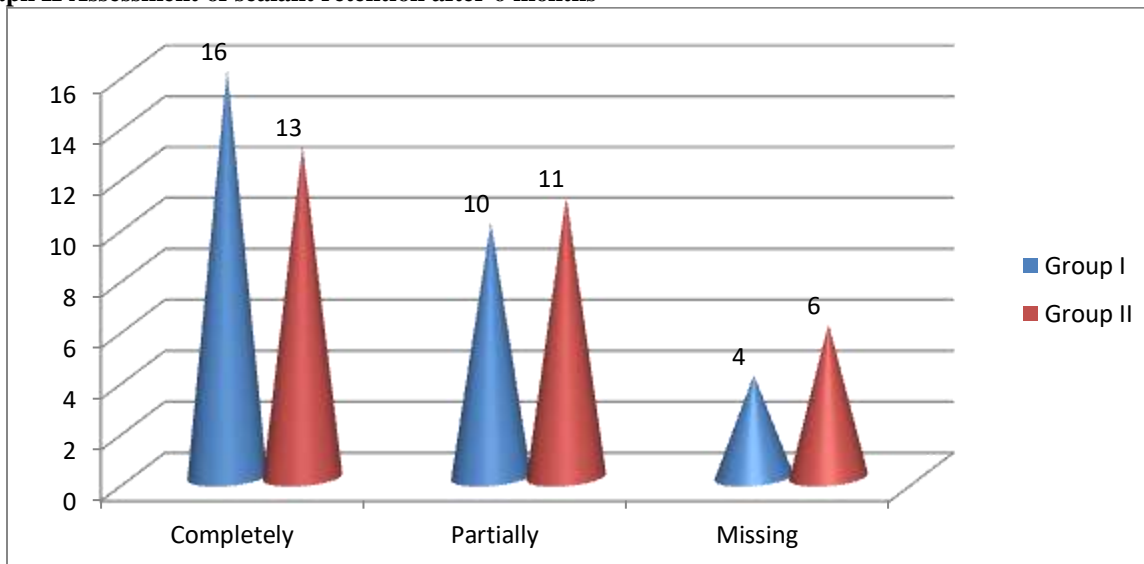


Table III Assessment of sealant retention after 6 months

Sealant retention	Group I	Group II	P value
Completely	16	13	0.91
Partially	10	11	0.89
Missing	4	6	0.05

Table III, graph II shows that after 6 months, sealants were completely present in 16 in group I and 13 in group II, partially in 10 in group I and 11 in group II and missing in 4 in group I and 6 in group II. The difference was non-significant (P> 0.05).

Graph II Assessment of sealant retention after 6 months

Discussion

Sealants are effective caries preventive agents as long as they remain bonded to teeth. The different methods recommended to improve sealant retention include cleaning of the occlusal surface prior to sealant placement with hydrogen peroxide, pumice prophylaxis, air polishing, mechanical preparation of fissures and air abrasion. Acid etching is the evidence-based method for enamel preparation before fissure sealing. However, concern has been expressed that the traditional acid etch technique for sealant placement does not allow for complete cleaning of the pits and fissures prior to sealant placement.⁶ The present study was conducted to assess the retention of pit and fissure sealants using different techniques.

In present study, out of 60 patients, males were 35 and females were 25. We found that after 3 months, completely retained sealants was observed in 20 in group I and 16 in group II, partially in 8 in group I and 10 in group II and missing in 2 in group I and 4 in group II. Doyle et al⁷ found no significant difference in retention of sealants in Group A and Group B ($p>0.05$) after three and six months follow up. The difference in sealant retention in primary and permanent molars was not significant ($p>0.05$). Maxillary molars showed superior retention compared to mandibular molars, which was statistically significant at both three and six months ($p<0.05$). The limitation of the study is small sample size. Moreover, the follow up period used in the study was very less. Long term follow up could lead to different results.

We found that after 6 months, sealants were completely present in 16 in group I and 13 in group II, partially in 10 in group I and 11 in group II and missing in 4 in group I and 6 in group II. The different methods

recommended to improve sealant retention include cleaning of the occlusal surface prior to sealant placement with hydrogen peroxide, pumice prophylaxis, air polishing, mechanical preparation of fissures and air abrasion. In present study, we assessed the retention of pit and fissure sealants placed using acid etch alone and a combination of air abrasion and acid etch techniques.⁸

Feigal et al⁹ found that structured fissure sealing programme is of great benefit to oral health of subjects since those who had no sealants had significantly poorer dental health than those who had all four first permanent molars sealed. Yazici et al¹⁰ compared acid etch and acid etch with air abrasion pretreatment techniques and found no significant difference in sealant retention in the two techniques at six months but found the difference to be statistically significant after nine and twelve months. Reddy et al¹¹ compared acid etching versus air abrasion and obtained similar sealant retention rates on occlusal surfaces evaluated after six months. They suggested use of air abrasion prior to acid etching may result in increased sealant retention.

Knobloch et al¹² compared the effect of air abrasion, acid etching and the combination of both procedures on shear bond strength of sealant to primary enamel and found the combination of air abrasion and acid etching resulted in superior bond strength.

Conclusion

Pit and fissure sealants are helpful in preventing dental caries, however, no difference in retention of pit and fissure sealants in either of technique was observed.

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