

# Effect Observation of Fluor Protector on Secondary Caries of Sjogren Syndrome Patients

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**Abstract:** Purpose: to observe the occurrence rate of secondary caries on sjogren syndrome patients by filling carious cavities with simply using resin materials and fluor protector added resin materials. Method: 20 cases of sjogren syndrome patients, who were filled the decayed teeth in the Stomatology Department of our hospital from September 2015 to September 2016, and 155 carious cavities were selected to be involved in the experiment, and secondary caries would be determined in 3 months, 6 months and 12 months after filling of carious cavities. Result: the occurrence rates of secondary caries in the experimental group after treatment in 3 months, 6 months, 12 months were 1.37%, 2.74%, 5.48% respectively; while the rates in the control group were 4.87%, 7.32%, 13.41% respectively. There was statistical significance between differences of the occurrence rates of secondary caries in two groups. Conclusion: the occurrence of intraoral secondary caries of sjogren syndrome patients can be effectively reduced by using fluor protector after filling decayed teeth.

**Keywords:** Fluor protector; Secondary caries; Sjogren syndrome

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## 1. Introduction

Caries is a common intraoral disease of sjogren syndrome patients, which is often caused by weakened teeth remineralization ability and changed micro-ecological environment resulted from reduction of saliva flow rate of sjogren syndrome patients and cariogenic bacteria grow in large amount. Secondary caries refers to the recurrence of caries caused by various causes after the treatment of primary caries, happened at the junction of the filling body and the tooth, which is the most common cause of filling replacement and failure in clinical so far.<sup>[1-3]</sup>

## 2. Information and Methods

### 2.1 Subjects and Groups

20 sjogren syndrome patients who would be filled the decayed teeth in the Stomatology Department in our hospital hospitalized from September 2015 to September

2016 were selected in the experiment in accordance with inclusion criteria: 1) all the patients with carious cavities had to be filled; 2) the patients had been informed and had agreed with it. Exclusion criteria: 1) pregnant women; 2) those was diagnosed as pulpitis or periapical periodontitis, and teeth filled in large areas. They were divided into experimental group and control group, with 10 cases in each group. In the experimental group, there were 48 decayed teeth and 73 carious cavities, one male case and 9 female cases, aged 33-74, with the average age of (53.48 ± 5.22). In the control group, there were 55 decayed teeth and 82 carious cavities, one male case and 9 female cases, aged 29 - 76, with the average age of (52.55±5.67).

### 2.2 Main Materials and Equipment

Filtek TMZ350 XT Flowable, Filtek TMZ350 XT Resin, Singal bond Universal adhesive agent, 5% Sodium Fluoride fluor protector (3M, America); gluma acid etchant

(Germany); LED blue ray curing light (Beyond, America)

### 2.3 Research Method

Oral health knowledge was publicized first, and followed by scaling and treatment. Control group: bad tissue was removed without preventive expansion, and cavity margin enamel was made beveled. After isolating from moisture and disinfecting the cavity, and pulp was indirectly covered with Dycal self-solidifying calcium hydroxide near the place; then color comparison, and placement of matrix band and wedge were performed. 3M Singal bond Universal self-etching adhesive agent was painted on the cavity wall and light-cured for 20 seconds. Then flowing resin Filtek TM Z350 Flowable was injected into the wall and at the foot of the wire with 0.5 - 1mm thick, and light-cured for 20 seconds; the cavity was filled with Filtek TMZ350 XT resin (<2mm/layer, 20s light-cured/layer) by layers, the shape was trimmed, followed by bite adjustment and polishing. Besides the above operation, the experimental group applied 5% Sodium Fluoride fluor protector to the whole dentition. No water or gargle was given within 30 minutes after the operation, and within 4 hours, only soft food could be eaten. No brushing or drinking in the evening. The fluor protector was applied to the whole dentition every 6 months. All the operation was performed by the same one doctor.

### 2.4 Therapeutic Evaluation and Observation Index

All patients were carried out secondary caries determination in 3 months, 6 months, and 12 months after treatment. The diagnostic criteria of secondary caries were: 1) discoloration of dental tissue at the edge of restorations; 2) gap appearing between restorations and teeth, which could be detected to the softening dental issue; 3) caries appearing on the other dental surface.[4] Adopted visual examination, probing and x-rays to examine the gaps of the filling body.

### 2.5 Statistical Methods

We used SPSS11.0 statistical software, and X2 test for comparison between groups. The difference was statistically significant at  $p < 0.05$ .

## 3. Results

3 months after treatment, the occurrence rate of secondary caries in the experimental group was 1.37% (1 ÷ 73), which was lower than that in control group: 4.87% (4 ÷ 82); 6 months after treatment, the occurrence rate of secondary caries in the experimental group was 2.74% (2 ÷ 73), which was lower than that in control group: 7.32% (6 ÷ 82); 12 months after treatment, the occurrence rate of secondary caries in the experimental group was 5.48% (4

÷ 73), which was lower than that in control group: 13.41% (11 ÷ 82); There was statistical significance between differences of the occurrence rates of secondary caries in two groups.

## 4. Discussion

Composite resin has excellent aesthetic effects, relatively low thermal conductivity, and can retain more dental tissue in the cavity preparation, thus being widely used in clinical practice. However, the composite resin will shrink during the solidification, and in oral environment, it will have edge dyeing, breakage, falling off, secondary caries, etc.<sup>[5-6]</sup> Stratified filling can reduce the shrinkage rate of the filling body, ensure sufficient polymerization and increase adhesion. Besides, fluid resin, as the backing material for the cavity bottom, has a good adaptability to the wetting of gap, which can permeate through the enamel surface where ordinary composite resin can hardly penetrate into. So it will increase the bonding force of the dental tissue and composite resin, reduce micro leakage, and lower down the appearance of secondary caries.

Patients with sjogren syndrome has impaired salivary gland and reduced secretion of saliva, so the original buffering and mechanical oral cleaning function have also been weakened, but since the restorations cannot change the activity level of caries activity, therefore, the possibility of secondary caries in these patients is higher.<sup>[7]</sup> In order to improve the teeth anti-caries ability, fluoride can be adopted. Fluor protector is efficient, safe and easy to be used, being the most effective and widely used fluoride anti-caries material in the world.<sup>[8]</sup> The common application methods are applying the protector on the tooth surface where the filling body is placed and applying it on the whole teeth. Sjogren syndrome patients who have been filled with restorations belong to high-risk group of decayed teeth, and using fluor protector only on the filled tooth surface is not enough, so they need entire-teeth method. Fluoride can inhibit the formation of acquired membrane, decrease the acid production capacity of bacteria and control the demineralization ability of enamel, and thereby reduce the possibility of secondary caries.<sup>[9]</sup>

Meanwhile, in order to avoid the occurrence of secondary caries, prevention awareness of dental doctor during the operation process is essentially important. It is necessary to eliminate the conditions for the appearance in every part of dental restoration. At the same time, the doctor should pay attention to the controlling of micro-fissures appearance, the teeth cleaning, the treatment of systemic-related diseases, and regular follow-up, and thereby reduce the happen of secondary caries.<sup>[10]</sup>

## 5. Conclusion

This experiment determined the occurrence rate of secondary caries on patients with sjogren syndrome by comparing the treatment with simply filling and fluor protector used after filling, and the result was that the rate of the control group was significantly higher than that of the experimental group. It shows that the occurrence of secondary caries of sjogren syndrome patients can be effectively reduced by using fluor protector after filling decayed teeth.

## References

- [1] Mjor IA, Toffenetti F. Secondary caries: A Literature Review with Case Repots[J]. Quintessence Int, 2000, 31(3): 165 - 179. (in Chinese)
- [2] Guangyun Lai, Mingyu Li, Research Progress of Secondary Caries[J]. International Journal of Stomatology, 2010, 37(1): 113 - 115. (in Chinese)
- [3] FitzgeraldRJ, AdamsBO, DavisME. A Microbiological Study of Recurrent Dentinal Caries[J]. CariesRes, 1994, 28(6): 409 - 415. (in Chinese)
- [4] Mingwen Fan, Cariology, Endodontology and Operative Dentistry[M]. Version 4 Beijing: People's Medical Publishing House. 2012: 86. (in Chinese)
- [5] Khan TN, Ali Abidi SY, Nawaz Khan KB, et al. Micromechanical Intervention in Sandwich Restoration[J]. J Coll Physicians Surg Pak, 2015, 25(11): 781-784. (in Chinese)
- [6] Yousaf A, Aman N, Manzoor MA, et al. Postoperative Sensitivity of Self Etch versus Total Etch Adhesive[J]. J Coll Physicians Surg Pak, 2014, 24(6): 383 - 386. (in Chinese)
- [7] Hui Ren, Tao Wang. One Case of Elderly Fully Teeth Neck Ring Caries Caused by Sjogren Syndrome. Chinese Journal of Geriatric Dentistry. 2014.7, 12(4) 211. (in Chinese)
- [8] Ronglie Lin, Xiang Li, Zian Liu. The Caries Preventive Effects of Duraphat with Pit and Fissure Sealant[J]. Journal of Guangdong Medical University, 2016, 34(3): 316 - 317. (in Chinese)
- [9] Chen H, Liu X, DaiJ, et al. Effect of Remineralizing Agents on White Spot Lesions after Orthodontic Treatment: A Systematic Review[J]. Am J Orthod Dentofacial Orthop, 2013, 143(3): 376 - 382. (in Chinese)
- [10] Xiping Feng, Occurrence and Prevention of Secondary Caries after Teeth Filled, West China Journal of Stomatology, 2014.4,32 (2). (in Chinese)