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Enameloplasty sealant technique- Two case reports

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ABSTRACT

The morphology of pit and fissures of posterior teeth make them vulnerable to dental caries. To prevent occlusal caries we can apply pit and fissure sealant. There is widespread disagreement among professionals between invasively opening the fissure before sealant placement and non-invasive sealant application. One of the invasive techniques is Enameloplasty Sealant Technique(EST) or reshaping the enamel before.

KEY WORDS: Esthetic bonding, Fragment bonding, Fiber reinforced composite bonding.

INTRODUCTION

Ever since Hyatt introduced the concept of Prophylactic odontotomy in 1923, various chemicals and filling materials have been painted into deep pit And fissures of posterior teeth to prevent caries.

A pit and fissure sealant is a resin material which is applied and mechanically bonded to an acid etched enamel surface thereby sealing Existing pit & fissure from oral environment.¹

Nagano (1960)² described 4 types of fissures.

U-Type: self cleansing, some what caries resistant.

V-Type: deep V shaped fissure.

I-Type: narrow slit like opening with large base.

K-Type: narrow short opening with broad base.

For V type fissure non invasive conventional pit and fissure sealant Application is enough. For I and K type fissures, invasive sealant technique is advisable.³ One invasive sealant technique is Enameloplasty Sealant Technique(EST); widening the narrow opening of fissure with a bur to help better penetration of sealant in to deep pit and fissure. Here we describe EST in a case report.

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Case report 1

A 12 year old girl patient reported to Department of pedodontics, J.K.K.Nataraja Dental College and Hospital (JKKNDC), Tamilnadu for regular check up. Her previous history revealed that she had amalgam restorations for left upper 1st and 2nd primary molars 5 years back.She had conventional sealant application on teeth no. 36 and 46, 8 months back. On examination she had lost sealant on both 36 and 46(Fig.1). There was 'l' type fissure on both 36 and 46. There was minimal discoloration and no explorer 'catch'. So it was decided to do EST. The occlusal surface was cleaned and polished with pumice slurry using a prophy brush.⁴ Then the surface was thoroughly rinsed with water and dried with air. Enameloplasty:⁵ Using a specially designed bur, (Fissurotomy NF bur, S.S.White Corp.) (Fig.2). The deep pit and fissures on the occlusal surface of the 1st molars were enlarged slightly with care to keep the preparation in enamel. This was done to open the narrow opening of deep 'l' type fissures⁶. Dry surface is paramount to successful retention of sealant. To avoid salivary contamination and to provide a dry surface the tooth was isolated with cotton rolls and saliva was ejected with a high volume suction device'.

Case reports with clincial techniques

The enamel surface was acid etched with 37% phosphoric acid gel(SS White Corp.) for 20 seconds⁸. The tooth surface was then washed with water for 40 seconds and dried for 15 seconds using oil free compressed air.⁸

Dry enamel surface had a dull, frosty white opaque appearance. Helioseal F sealant (Ivoclar vivadent) was applied to the prepared tooth surface with a fine haired brush. To avoid incorporation of air bubbles, the sealant was gently teased through the fissure. Then waited for 15 seconds. It was light cured for 40 seconds. Occlusion was checked for high points and adjusted. (Fig.3) Patient was recalled after 6 months for review. After 6 months there was good sealant retention.



Case report 2



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A 8 year old girl child came to Department of Pedodontics, JKKNDC, with complaint of food impaction in left lower back region. On examination, there was a proximal caries in tooth no. 74. and deep 'I' type fissures on teeth no. 36 and 46. Tooth no.74 was restored with silver amalgam.

Tooth No.46 (Fig.4) was cleaned, isolated and enameloplasty was done using the fissurotomy bur (Fig.5). Acid etching was done for 20 seconds (Fig.6). Washing and drying was done. Helioseal F sealant was applied(Fig.7). The same procedure was repeated in tooth No.36 (Fig.8). Occlusal adjustment was done to remove high points and patient was recalled after 6 months for review.

Discussion

Ripa(1973)⁹ observed that occlusal surfaces represented only 12.5% of total tooth surface but they accounted for almost 50% of caries in school children.

Occlusal surface decay is seen commonly because of inaccessibility of the area to routine hygiene measures. So ADA in 1983 recommended that pit and fissure sealant should be used as a part of total caries preventive programme that also includes among others optimum fluoride treatment and restricted frequency of refined carbohydrate intake.

Nagano $(1960)^2$ reported that 42% of occlusal fissures had narrow opening and they prevented the entry of explorer tip into the area and diagnosing initial caries in these structures is difficult. Also, application of sealant in to the deep I , K type fissures with out air entrapment is difficult. So in case of deep I , K type fissures that are slightly discolored, EST is better than conventional sealant technique.

Advantages of EST¹⁰:

- 1. Ability to diagnose extent of carious lesion if present and ability to plan the treatment accordingly.
- 2. Higher retention rate for sealant was obtained following mechanical Preparation of fissure area.

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Case report 2

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Risk of micro leakage was also reduced when fissure was enlarged.

3. EST allowed a deeper sealant penetration and superior sealant adaptation than conventional sealant technique.^{11,5}

Following enameloplasty, tooth surface should be acid etched to create microporosities for sealant to enter and form resin tags. Mc Donald suggested that 20 seconds acid etching is enough to create microporosities.

Helioseal F (Ivoclar vivadent) is a light curing, white shaded, fissure sealant featuring fluoride release. It's monomer matrix consists of BISGMA, Urethane Di Methacrylate,TEGDMA. Fillers include silicon di oxide and fluoro silicate glass. Helioseal F shows good retention.¹² Sealants are intended to protect caries susceptible tooth surfaces that are least benefited by fluoride. So with optimum use of pit & fissure sealant , fluoride, diet control, we can achieve caries free generation.

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