



Effect of Fluoride Varnish with ACP on Caries Progression of Partially Erupted First Permanent Molar in Grade 1 Student at Wat Nawong School

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Abstract

The objective of this study is to determine the effectiveness in the clinical use of 5% fluoride varnish with amorphous calcium phosphate (ACP) as an intervention to decrease dental caries progression on partially erupted first permanent molars among children with high caries risk. Forty-two 1st Grade students with partially erupted first permanent molars have participated in this 6-month clinical trials with split-mouth design. They were randomly divided into a fluoride varnish (Enamel Pro[®]) group and a control group (each group consisted of 42 partially erupted first molars). The Chi-square test was used for statistical analysis, with a 95% level of confidence ($p < 0.05$). Thirty-seven participants (88%) of the study group had no caries progression, while 5 participants (12%) had caries progression. In the control group, 21 participants (50%) had no caries progression, and 21 participants (50%) had caries progression. There was a significant difference in caries progression between the two groups. Fluoride varnish group also resulted in 76% caries reduction in partially erupted first permanent molars at six months. In conclusion, 5% Sodium fluoride varnish with ACP (Enamel Pro[®]) is effective in reducing caries progression in the study group. Fluoride varnish can be used as an alternative intervention for reducing caries progression in partially erupted first permanent molar among high caries risk children.

Keywords: *fluoride varnish, high caries risk, partially erupted first permanent molars, caries prevention*

1. Introduction

Dental caries is a multifactorial disease affecting most people in the developing country all over the world. According to the 7th National oral health survey 2012, it is stated that caries incidence in 5-6 years Thai children were 78.5% (Dental health division, Public health department, Thailand, 2012). The first permanent molar is the most important unit of mastication and essential in the development of desirable occlusion. It plays a vital role in the formation of permanent dentition and a normal bite. Early loss of a first permanent molar in a child can lead to changes in occlusal mechanism (Angle, 1907). The first permanent molars are erupting at an age at which diet habits of the child predispose to caries, and oral hygiene practice is still not well developed, these surrounding conditions contribute to high susceptibility to caries. (Lakhani, Arora, Bhayya, Dogra, & Jain, 2016). Therefore, these particular teeth deserve much attention in dental preventive programs directed towards elementary school children which is the average erupting age (Fukada et al., 1982). However, a high percentage of caries incidence in the first permanent molars during or immediately after an eruption has been reported in many studies. One study reported 59.8% of lower first molars to suffer from caries immediately after eruption while another similar study showed that 40% of occlusal caries occur during eruption even if the crown is still covered by the gingiva. (Miyano, Kawagoe, & Osawa, 1974; Iwakura, Shimada, & Takagi, 1974). Erupting teeth are more susceptible to develop caries due to the favorable condition of plaque accumulation and immature enamel with high organic content structure (Burt, 1984; Carvalho, Ekstrand & Thylstrup, 1989). It takes less than one year for the first permanent molar to have full occlusion from the point they emerge; therefore, preventive strategies of occlusal caries in children should be initiated as soon as possible after the eruption (Carvalho, Ekstrand & Thylstrup, 1991).

It is known that the preventive dental programs to prevent and control occlusal carious lesions on primary and permanent teeth is pit and fissure sealant. However, it is difficult to do effective moisture control on partially erupted molar teeth; therefore, more practical preventive measure should be accomplished in this condition.