CHAPTER I

INTRODUCTION

At the present day, the use of direct bonding brackets and other attachments becomes a common technique in fixed orthodontic treatment. This technique is useful because it can obviate the use of cemented metal bands that frequently injure to periodontal tissue. Bunocore (1968) reported that acid could be used to alter the enamel surface suitable for adhesion. He found that acrylic resin could be bonded to human enamel after being conditioned with 85 % phosphoric acid. In 1969, Newman was the first person who used this technique in fixed orthodontic treatment and named "Direct bonding technique". In most-present-day, enamel etchant contains 30-40 % phosphoric acid and produces shear bond strengths of composite resin to enamel about 20 Mpa (Edward, 1998). Bond strength in this range provides routine successful retention and sealing of resin for a variety of clinical applications. There are many factors that may influence the result on shear bond strength of bracket base on enamel. These include a) concentration of acid, b) etching time, c) type of adhesive and d) type of bracket base. Many investigations have also been carried out regarding to the influence of different enamel structures on bond strength. It was found that prismless enamel might have reduced the retention of resin. Mechanical removal of the prismless layer before etching procedure has been recommended for better retention.

Now the use of fluoridation in community is in vogue. Long-term intake of fluoride during enamel formation results in a continuum of clinical changes of the enamel varying from fine white lines in the enamel to severely chalky, opaque enamel which breaks apart soon after tooth eruption. The severity depends on amount of fluoride intake during the tooth formation.

Rough surface of fluorosis teeth may cause problem in direct bonding process because of their resistance to acid etching following with the poor retention of fixed orthodontic appliance. The treatment will be more complicated and the treatment time will be extended because it is difficult to rebond on the same bracket position. So it takes more visits to correct the malposed teeth. Although some investigators have claimed that no significant differences of mean bond strength between non-fluorosis and fluorosis teeth, but variations in etching time and other factors can effect to bond strength. The conclusion is not clear.

Purposes of the study

1. To investigate the fluoride concentration, shear bond strength of bonded orthodontic brackets in each samples of fluorosis and non-fluorosis teeth.

2. To compare the fluoride concentration in each group of fluorosis and non-fluorosis teeth. Therefore, null hypotheses, H_0, is :

There are no significant differences of fluoride concentration in the three group of samples.

3. To compare the shear bond strength in each group of fluorosis and non-fluorosis teeth. Therefore, null hypotheses, H_0, is :

There are no significant differences of shear bond strength in the three group of samples.

The hypothesis will be rejected if there are significant difference and, then the multiple comparison will be calculated to find out the difference between or within groups.

4. To find out the correlations between the fluoride concentrations and the shear bond strengths of all samples. Therefore, null hypotheses, H_0, is :

There are no correlations between the fluoride concentrations and the shear bond strengths.

The hypothesis will be rejected if there are significant correlations between the fluoride concentrations and the shear bond strengths.

Scope of the study

This study was aimed to investigate the fluoride concentration and the shear bond strength in three sample groups of fluorosis and non-fluorosis premolar teeth. The investigated values would be compared, and the correlations calculated.