CHAPTER I

INTRODUCTION

The most common cause of bond failure is contamination during the bonding process. For successful bonding, the orthodontist must protect the enamel from contamination by dental wax, dust powder from gloves, remaining aluminum oxide after sand blasting, skin oil, moisture, saliva and blood. These unwanted substances are mostly under control; however, it is very difficult to control saliva contamination in some areas, for example, partially erupted teeth, posterior teeth, especially second molars, and surgically exposed impacted teeth. It would be advantageous to reduce the chance of bond failure from saliva contamination. Consequently, the use of hydrophilic orthodontic bonding adhesives, which are capable of maintaining proper bond strength in moisture or saliva-contaminated conditions, has been proposed as the method of choice for orthodontic bonding.

Typically, the conventional orthodontic bonding adhesive contains resin composite, which has hydrophobic properties and requires a completely dry field. Previous studies of a conventional adhesive system under saliva-contaminated conditions demonstrated significantly decreased shear bond strength values, which were not clinically acceptable.[1-5]

Recently, some manufacturers have developed moisture-resistant adhesives systems by introducing novel materials, which fulfill the orthodontist's demands. The materials provide reduced technique sensitivity, increased tolerance to wet conditions,

and acceptable bond strength. Moisture-resistant orthodontic adhesive systems, therefore, have become an alternative for bonding moisture- or saliva-contaminated enamel, as they offer better bond strength under wet conditions.

The purposes of this study were to evaluate and compare the shear bond strength of three moisture-resistant light-cured orthodontic adhesive systems (Transbond™ PLUS Color Change, Beauty Ortho Bond®, and Assure®) and a conventional light-cured orthodontic adhesive system (Transbond™ XT) in bonding stainless steel brackets on enamel surfaces under either under non-contaminated or artificial saliva-contaminated conditions.

Purposes of the study

1. To measure and compare the mean shear bond strength of different adhesive systems used to bond orthodontic stainless steel bracket under non-contaminated and artificial saliva-contaminated conditions.

2. To describe the modes of bond failure after de-bonding the bracket of different adhesive systems.

Null Hypothesis

There is no statistically significant difference in mean shear bond strength between conventional and moisture-resistant adhesive systems used for bond orthodontic stainless steel brackets under under non-contaminated and artificial saliva-contaminated enamel surfaces.

The null hypothesis will be rejected if there is a significant difference in the mean shear bond strength values.

Scope of the study

This experimental study was aimed to compare the mean shear bond strength of three moisture-resistant light-cured orthodontic adhesive systems (Transbond™ PLUS Color Change, Beauty Ortho Bond®, and Assure®) and a conventional light-cured orthodontic adhesive system (Transbond™ XT) under non-contaminated and artificial saliva-contaminated conditions. Thermocycling regimen comprising 2000 cycles at 5-55°C will be performed to allow an artificial aging effect.