

# CHAPTER I

## INTRODUCTION

### 1.1 Principles, theory and rationale

Crown inclination is one of six keys to normal occlusion as described by Andrews in 1972 and commonly used for considering of orthodontic treatment success. Crown inclination is important not only for esthetics, but also for proper occlusion. When the upper anterior teeth are too upright, the occlusion is unstable. The canine and incisal guidance are insufficient and the posterior teeth will drift toward the mesial. As a results, this study focused only on the crown inclination.

The previous studies (Andrews, 1972 ; Dellinger, 1978 ; Vardimon and Lambertz, 1986 ; Duangtaweesub, 1997) showed crown inclination variations. Steiner (1960), Tweed (1966), Hasund and Ulstein (1970), Bibby (1980), Casco and Shepherd (1984), Perera (1987), Jotikasthira (1988) and Ross et al. (1990) reported that inclinations were influenced by skeletofacial morphologies.

Although there were numerous researches that investigated the correlations between various skeletofacial variables and inclination, all of them investigated the inclination by using cephalograms. The limitation of cephalograms is, it can only show the inclination of the central incisors, not that of the remaining teeth. From a literature review, it was apparent that the correlations between skeletofacial variables and crown inclination that was measured directly from impression models had never been reported.

Therefore, this study would clarify the correlations between skeletofacial cephalometric variables and crown inclination of each tooth that was measured from impression models of northern Thai adults with good occlusion.

## **I.2 Purposes of the study**

1. To determine crown inclination of each tooth except third molars and some skeletofacial cephalometric values from northern Thai adults with good occlusion.

2. To compare crown inclination of each tooth between the right and the left sides and sexes in northern Thai adults with good occlusion. Therefore, null hypotheses ( $H_0$ ) were :

2.1 There was no significant difference of crown inclination between the right and the left sides.

2.2 There was no significant difference of crown inclination between males and females.

3. To compare some skeletofacial cephalometric values between sexes in northern Thai adults with good occlusion. The null hypothesis was the means of some skeletofacial cephalometric values between males and females were not different.

4. To determine correlations between some skeletofacial cephalometric variables and crown inclination of each tooth in the northern Thai adults with good occlusion.

5. To determine predictable equations for crown inclination of each tooth that are proper for a particular skeletal pattern.

## **I.3 Anticipated benefits**

1. To predict the inclination value of each tooth from the skeletofacial cephalometric variables which are significantly correlated.

2. To provide the certain treatment goals of particular skeletal patterns for the northern Thai population.

#### **I.4 Scope of this study**

The scope of this study was to investigate correlations between some skeletofacial cephalometric variables and crown inclination of each tooth, except third molars, in northern Thai adults with good occlusion.

#### **I.5 Definition**

**ADULT** person who passed adolescent growth spurt which had growth changes less than 0.2% per year ;  $\geq 15$  years for female and  $\geq 17$  years for male (Nabangxang et al., 1978).

**AGE** chronological age

**CROWN INCLINATION** labiolingual or buccolingual inclination of the long axis of crown, not of the long axis of entire tooth

**GOOD OCCLUSION** an occlusion with class I molar, premolar and canine relationships, no or slight incisor crowding, no increased overbite and overjet, no proximal caries or proximal restoration and flat occlusal plane or mandibular curve of Spee should not be deeper than 1.5 millimeter.

**LATERAL CEPHALOGRAM** a two-dimensional image of the skull in lateral view in centric occlusion for morphologic analysis by evaluating the sagittal and vertical relationships of facial skeletal, dental and soft tissue parts

**LONG AXIS** the vertical line passes through the most prominent part in the center of the labial or buccal surface.

**NORTHERN THAI** persons who were born and had stayed in the northern part of Thailand up to the time of the investigation.