

CHAPTER V

DISCUSSION

5.1 METHODOLOGICAL CONSIDERATIONS

The purpose of this study were to evaluate the effects of the brass neck-coils having upon the facial and dental characteristics. Ninety-three subjects were divided into two groups; the subjects wearing brass neck-coils (n=61), and the subjects not wearing brass neck-coils (n=32). Each group was divided into two age groups; age group 1 (5-15 years) and age group 2 (over 15 years).

To study the effect of the brass neck-coils on Padaung women who wore the brass neck-coils, the best type of compared group for this study would be Padaung women who did not wear brass neck-coils. Obviously, such a group is not feasible because almost all Padaung women wear brass neck-coils from the age of five years. Since Padaung are a subgroup of Red Karen (Lacharaj, 1993), therefore a group of Red Karen who lived in the same villages would appear to be the next best compared group. However, this investigation found five Padaung women who refused to wear the brass neck-coils. They were included in the compared group.

The sample was selected from 5 years old, thus some of them were in the deciduous dentition stage which we excluded in the model analysis. The beginning age for this study should be delay to 8 years old to assure that the first permanent molars were fully erupted. In addition, there are two different stages of dentition during 8-15 years, this period should be divided into mixed dentition and permanent dentition in order to be more informative in the results.

In facial analysis, the Frankfort horizontal plane was used as the horizontal reference line. This line connects the uppermost point of the tragus to the soft tissue Orbitale. The soft tissue Orbitale point was located by careful palpation and marking its place on the face of each subject with a black pen. Unfortunately, this point was not visible on the lateral facial photographs of eight subjects. Therefore, in these eight

subjects we decided to use the line from the outer canthus of the eye to the superior attachment of the ear (C-SA line) instead (Figure 17).



Figure 17 The C-SA line

The C-SA line, which parallels the Frankfort horizontal, is a consistent, practical, clinical anatomic reference (Davidson 1979).

Another way to solve this problem in these cases is to construct a reference line using such material as soft brass wire. The wire will connect the soft tissue Orbitale point to the uppermost point of the tragus and then fix to the side of the face before the photographs are taken.

The brass neck-coils seem to produce pressure on the mandible. This pressure is intermittent, since the subjects wearing brass neck-coils can move their head within the brass neck-coils. The amount of pressure exerted on the mandible should depend upon the posture of them.

ต้นฉบับไม่มีหน้านี้



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

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5.2 FACIAL VARIABLES

5.2.1 Transverse relationship

The eye and mouth widths were not significantly different between neck-coil wearing women and those without. The nose width was wider in the subjects wearing brass neck-coils than in the subjects not wearing brass neck-coils. Since eyes were the anatomical structure located farther from the brass neck-coils' pressure than the nose, this pressure had less affect to the eyes. Mouth width was not significantly wider in the subjects wearing brass neck-coils than in the subjects not wearing brass neck-coils but there was tendency in this direction.

The upper and the lower face widths did not show significant differences between the subjects wearing brass neck-coils and the subjects not wearing brass neck-coils, presumably as there are no parts of the brass neck-coils supporting the lateral side of the face. Thus it had no effect on the width of the face.

5.2.2 Sagittal relationship

The sagittal relationship of maxilla and mandible was approximately described by the horizontal distance between Subnasale to soft tissue Pogonion (Sn-Pg'). The Sn-Pg' was greater distance in the subjects wearing brass neck-coils than in the subjects not wearing brass neck-coils. This meant that the subjects wearing brass neck-coils had more Class II facial pattern than the subjects not wearing brass neck-coils.

5.2.3 Vertical relationship

The total face height and the lower face height of the subjects wearing brass neck-coils were significantly shorter than the subjects not wearing brass neck-coils. This result was similar as the effect of the Milwaukee brace (Glass, 1961; Logan, 1962; Thors, 1964; Alexander, 1966; Eastham, 1971). Broadbent (1955) stated that the normally developing face continues to grow downward, forward, and outward, with greatest amount of increase taking place along the lower border of the mandible. The reason for this is that the lower border of the body of the mandible is the area in which pressure of

the brass neck-coils occurs. This pressure, resulting in a directional change of the normal growth pattern, affects the vertical growth. Additionally a definite absorptive type of remodeling along the inferior border of the mandible was found in patients who had worn the Milwaukee brace (Ernst, 1969).

The upper lip length and the lower lip length were affected too. They were significantly shorter in the subjects wearing brass neck-coils than in the subjects not wearing brass neck-coils. However there were no significant differences in upper and lower lips proportion between the subjects wearing brass neck-coils and the subjects not wearing brass neck-coils. This means that the effect of brass neck-coils on the upper and lower lips lengths were not different.

The maximum mouth opening was significantly different between the subjects wearing brass neck-coils and the subjects not wearing brass neck-coils. The subjects wearing brass neck-coils had less maximum mouth opening than the subjects not wearing brass neck-coils. The brass neck-coils, which contact the inferior border of the mandible, seemed to limit vertical movement of the mandible. Therefore, the limitation of vertical movement of the mandible may cause TMD problems and this suggestion should be addressed in further studies.

In our observations, by inspection and palpation, we also found marked local resorption of lower border of the mandible at the position which brass neck-coils are attached in most subjects wearing brass neck-coils. The amount of resorption increased in relation to the ages of the subjects. Unfortunately this variable cannot be measured from photographic analysis. Radiographic analysis is the way to do so.

5.3 DENTAL VARIABLES

The upper and lower incisor inclinations were significantly more proclined in the subjects wearing brass neck-coils in age group 2 than in the subjects not wearing brass neck-coils at the same age group. These results agree with the reports of the effects of the Milwaukee brace in many studies (Blont, 1958; Logan, 1962; Alexander, 1966; Northway *et al.*, 1974). The pressure from brass neck-coils leads the lower incisor and

lower canines to press superiorly upon the lingual inclined surfaces of the maxillary anterior teeth, causing these teeth to tip labially. Palatal height was significantly flatter in the subjects wearing brass neck-coils than in the subjects not wearing brass neck-coils. This result is corroborated by the study of the effect of the Milwaukee brace by Alexander (1966). The brass neck-coils are worn over longer periods of time, causing definite directional change in vertical growth of the maxilla.

There was no significant difference in overbite between the subjects wearing brass neck-coils and the subjects not wearing brass neck-coils. This contrasts to the finding of Logan (1962), who found a deepening of the bite in subjects treated with the Milwaukee brace. However, the overjet was significantly greater in the subjects wearing brass neck-coils than the subjects not wearing brass neck-coils. This would be due to the protrusion of the upper incisor. Although the lower incisor was proclined too, it was usually placed at the lingual inclined of the upper incisor which made the upper incisor have a more forward position than the lower incisor, which increased the overjet.

For the arch widths, the results of this study showed that the upper and the lower anterior arch widths and also the upper and lower posterior arch widths show no significant differences in both subjects wearing brass neck-coils and subjects not wearing brass neck-coils. In contrast, Logan (1962) reported the widened maxillary arch in the molar and premolar region due to buccal tipping of the crowns and slightly increased lower arch width in patients with the Milwaukee brace therapy.

The upper intercanine width was not significantly different in both subjects wearing brass neck-coils and subjects not wearing brass neck-coils but lower intercanine width was significantly narrower in the subjects wearing brass neck-coils.

The upper and lower anterior arch lengths were significantly greater in the subjects wearing brass neck-coils than in the subjects not wearing brass neck-coils. That might be due to more proclined of upper and lower incisors.

In the upper arch, there was no statistically significant associations between V-shaped arch form and neck-coil wearing. However, there was statistically significant associations between V-shaped arch form and neck-coil wearing in the lower arch. This associations might be due to the narrower of the lower intercanine width, and additionally

to the proclined of the lower incisor. The subjects wearing brass neck-coils seemed to avoid the pressure from brass neck-coils by raised their head up. This can alter the muscle function and affected the form of lower arch.

5.4 CLINICAL IMPLICATIONS

In this study, the pressure from brass neck-coils seems to affect growth by induced a directional change in the normal growth pattern.

In relating this possibility to clinical orthodontics, the use of an appliance which produce pressure to the lower border of the mandible seems feasible in certain cases in which vertical growth is predominant.

5.5 LIMITATIONS

- 1) Radiographic analysis is a better way to describe the effect of brass neck-coils to the craniofacial morphology. This could not perform in our study because of the ethic considerations.
- 2) The cross-sectional nature of sample is a limitation of the study. This makes it difficult to assess actual changes that take place.
- 3) The changes of brass neck-coils among Padaung were not exactly at the same age. Thus, the amount of pressure from the brass neck-coils varies across individual.
- 4) Few of Padaung women were selected as the compared group because most of them wore brass neck-coils. Then, most of the compared group were Red Karen women.

5.6 SUGGESTIONS

- 1) Further study with radiographic analysis should be useful to describe more effect of the brass neck-coils.
- 2) The longitudinal and prospective study in this sample can be clearly indicated actual age change that takes place.