Rotation of the Maxillary Central Incisors in Nepalese Inhabitants

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Introduction

Mesiopalatal rotation (winged teeth : WT) of the maxillary central incisors is frequently encountered in some human populations, this is due to the rotated position of this teeth in sockets. The distal part of the crown is turned forward and the mesial part is in a lingual position. Enoki (1958)¹⁾ reported bilateral winging in 9.64% of 1,089 school children in Japan. On the other hand, the reverse position of mesiopalatal rotation, that is mesiolabial rotation (counter-winged teeth : CWT) also occurs in varying frequency, with a higher incidence among groups having narrow palates such as Caucasians. According to Dahlberg (1959)²⁾, 42% of the Caucasian group showed counter-winging, but only 3 % showed the winging trait. This counter-winged position gives the impression of a pointed prominence of the maxillary incisor region. Both condition, WT and CWT, can be seen unilaterally and bilaterally. WT has been described by Rothhammer et al. (1968)³⁾ as a trait characterizing Mongoloid populations due to its relatively high frequency in those groups compared with Caucasian populations. The reasons for these racial difference are not known, but may suggest a genetic cause for WT.

The purposes of this paper are to study the frequencies of the mesiopalatal rotation of the maxillary central incisors among the Nepalese, and to examine its relation to spaciersion of maxillary incisors, the classification established by Dahlberg (1959)²⁾ was adapted. As it was,

Fig. 1 Classification of rotated central incisors by Dahlberg (1959)²⁾.

five types of Position were used in this study. These included all teeth in straightened alignment, bilateral winging, unilateral winging, bilateral counter-winging, and unilateral counter-winging (Fig.1). The existence of central crowding was presumed when so-called "multiple crowding" was observed in upper anterior region, and of spacing when a diastema between maxillary central teeth was greater than 1 mm. In addition, chi-square analysis were applied throughout in statistical comparisons.

Results and Discussion

The distribution of different types of rotated maxillary central incisors is shown in Table 1 with the sex separated. The absence of sexual dimorphism of the trait was revealed by the lack of a statistically significant difference between its incidence in males and females ($\chi^2 = 1.088$ with $df = 4$, $0.90 > P > 0.85$). We, therefore, decided to pool the data and the following descriptions were based on these data (Table 1). The highest frequency of rotational version of the maxillary central incisors was found in Type C (straightened teeth, 55.7%). Of these 5.7% exhibited bilateral and 1.4% unilateral WT. On the other hand, for CWT, 32.9% were bilateral and 4.3% unilateral. The frequencies of rotated maxillary central incisors in several populations are listed in Table 2. All these data were obtained according to the criteria for classification developed by Dahlberg (1959)²⁾. First of all, it is easily recognized that a higher frequency of bilateral CWT (32.9%) is found in the Nepalese than in Mongoloid and Pacific populations, who ranged from 16.6% for the Palauan⁴⁾ to 0.0% for the Melanesian⁵⁾. However, the frequency of CWT in the Nepalese is relatively close to the value for American White²⁾ and Pashtuns⁶⁾ derived from Caucasian racial stock. As opposed to this, the Nepalese frequency of bilateral WT (5.7%) is lower than those observed in Mongoloid and Pacific racial groups. This value is quite similar to that of the Pashtun, of course, all the groups

Table 1 Distribution of rotated maxillary central incisors (individual count)

Type	A	B	C	D	E
Male	2(4.3)	1(2.1)	26(55.3)	2(4.3)	16(34.0)
Female	2(8.7)	0(0.0)	13(56.5)	1(4.3)	7(30.4)
Total	4(5.7)	1(1.4)	39(55.7)	3(4.3)	23(32.9)

Classification is adapted from Dahlberg (1959)²⁾

Numbers in parentheses are percentages.

Table 2 Percentage incidence of rotated maxillary central incisors in several populations

Sample	A	B	C	D	E	Source
Nepalese	5.7	1.4	55.7	4.3	32.9	Present study
American White	3	3	46	8	42	Dahlberg (1959) ²⁾
Pashtun	5.6	2.8	33.3	11.1	47.2	Iizuka (1979) ⁶⁾
Japanese	9.7	15.1	52.1	9.2	13.9	Enoki & Nakamura (1959)
Palauan	7.3	11.5	59.4	5.2	16.6	Sakuma <i>et al.</i> (1987) ⁴⁾
Melanesian	19.6	4.3	76.1	0.0	0.0	Turner & Swindler (1978) ⁵⁾
Easter Islander	11.0	0.9	83.9	0.0	4.2	Turner & Scott (1977) ⁷⁾

Classification is adapted from Dahlberg (1959)²⁾

Table 3 Percentage incidence of the diastema between maxillary central incisors

Sample	N	%	Source
Nepalese	70	4.29	Present study
Japanese	105	3.36	Susami <i>et al.</i> (1971) ⁸⁾
Caucasian	1337	5.61	Mills (1966) ⁹⁾
Chewa	166	20.4	Sakuma (1989) ¹⁰⁾

Diastema greater than 1mm between maxillary central incisors.

Table 4 Percentage incidence of the crowding and spacing at maxillary anterior segment

Sample	Crowding*	Spacing**	Source
Nepalese	5.71	7.14	Present study
Japanese	9.97	5.03	Susami <i>et al.</i> (1971) ⁸⁾
Chewa	5.42	28.31	Sakuma (1980) ¹⁰⁾

* : Multiple crowding

** : Excluded from the midline diastemas

have a large number whose central incisors are aligned straight in the normal arch curves. These range from 33.3% in the Pashtun to 83.9% in the Easter Islander⁷⁾. 55.7% of Nepalese samples exhibited this tooth position. The Nepalese showed an intermediate frequency between Caucasian and Pacific populations. Judging from the above-mentioned facts, it is concluded that the maxillary rotational version of the Nepalese is closely similar to Caucasian populations as a whole, but differ from Mongoloid and Pacific racial groups. With the diastema between maxillary central incisors (Table 3), the frequency of Nepalese (4.29%) is more or less close to the values for Japanese⁸⁾ and for the Caucasian⁹⁾, and remarkably lower than the 20.4% for the Chewa¹⁰⁾ derived from African Negroid racial stock.

Finally, we focused on the relationships between the rotated central incisors and abnormal alignment such as crowding and spacing (Table 4). Crowding of the maxillary anterior region was found in 4 cases (5.71%) out of 70. This version of the crowding among Nepalese is almost similar to that of the Chewa. On the other hand, 5 cases (7.14%) out of 70 showed the lateral spacing in maxillary anterior segment. The percentage incidence of

Nepalese is obviously lower than that of the Chewa. Pearson's correlation coefficients between rotated central incisors and abnormal alignment at maxillary anterior segment were 0.2104 (crowding) and 0.1614 (spacing), respectively. These coefficients are quite low, and no significant relationships are found at the 5 % level in the Nepalese. This evidence suggests that this particular trait is not caused by a surplus of space for the teeth (spacing) or a lack of space (crowding) but by other factors such as morphogenetic elements of the teeth root. To investigate this point in more detail, much additional studies must be acquired.

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ネパール住民における上顎中切歯の捻転について

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下顎中切歯の近心舌側捻転（winged teeth：WT）はモンゴロイド集団に特徴的に認められる形質と考えられている。一方、遠心舌側捻転（counter-winged teeth：CT）はコーカソイド集団に比較的高い頻度で認められる。今回は上記のような上顎中切歯の特徴的な配列について、ネパール国住民 70 名から得られた歯牙石膏模型をもちいて検索した。上顎中切歯が示す捻転状態は Dahlberg（1959）の分類に基づいて判定し、以下のような結果を得た。両側性遠心舌側捻転はモンゴロイドや太平洋集団に比べ、ネパール人では比較的高頻度に見られ、コーカソイド集団にやや類似していた。一方、近心舌側捻転の頻度はネパール人ではモンゴロイドや太平

洋集団より低かった。これらの結果からは、ネパール人における上顎中切歯捻転の様式はコーカソイド集団に比較的類似しておりモンゴロイドや太平洋集団とはやや異なると考えられた。ネパール人における上顎切歯部の歯列異常については、叢生が 70 例中わずかに 4 例見られたにすぎない。一方、側方および正中歯間離開は各々 7.14% および 4.29% に認められた。

また、上顎中切歯における捻転と配列異常の頻度には有意な相関は認められなかった。このことから、上顎中切歯の捻転様式は歯間の離開や狭窄によるものでなく、歯根の形態など、他の要因によるものと考えられた。