Feature Of The Upper Central Incisors In Class II, Division 2

N. R. E. Robertson, M.D.S., D.D.O.
Roy Hilton, D.D.O.
Manchester, England

Introduction

The well known orthodontic complex somewhat loosely described as "Class II, Division 2" is a reasonably common condition and occurs in some five per-cent of cases of malocclusion. From clinical observation the writers had gained the impression that the crowns of the upper incisors in these cases were thinner labiopalatally than those found in other malocclusions. It was therefore decided to follow this up by comparing a number of Class II (2) cases with a similar number of unselected cases.

Classification

The Class II (2) complex has been variously described by many authors. While there is general agreement about its basic features, there exist some differences of opinion as to which, if any, of these many features are essential to the class. Thus Logan (1959) regards the crowding out of laterals by centrals and canines as important, while Ridley (1960) appears to regard retroclined upper centrals as the prime determining factor in the classification. Rix, Tulley and others have described the so-called "tooth apart blunt swallow" said to be found in most of these cases, and Nicol (1954) sees the high lip line as an essential feature.

Any confusion which exists arises from the continued use of Angle terminology coupled with an attempt to fit additional subsequently recognized etiological factors into a classification which was never intended to classify anything other than anteroposterior dental arch relationships.

For the present purpose the basic features of the complex may be summarized as follows. The occlusion is built on a Class I or mild Class II skeletal base relationship with a Frankfort mandibular plane angle often lower than average. The upper buccal segments are usually slightly farther forward than the lower, while anteriorly the upper incisors are closely related to the lowers with a deep incisor overbite. In the typical or classical Class II (2) case the upper central incisors are retroclined and the laterals are proclined and overlap the centrals. In the atypical case the upper incisors are all retroclined, the overbite is, of course, deep and there is lack of space for the upper canines.

Method

Accurate stone models of sixty cases of Class II (2) malocclusion (Group A) were examined. In classifying these cases, more stress was given to the incisor arrangement than to the buccal segment relationship, the essential features being closely related upper and lower incisors with deep overbite.

Using a gauge, measurements were made of the labiopalatal thickness of the upper left central incisor at its thickest point, of its maximum length from incisal edge to gingival margin labially, and of its maximum mesiodistal width. These measurements were repeated on a group of sixty other models with no selection other than that they were not Class II (2) (Group B). The measurements were made independently by both writers with high

TABLE I

Thickness	*Group A* N	*Group B* N
5.5	7	Nil
5.5 - 6.0	15	5
6.0 - 6.5	19	14
6.5 - 7.0	14	18
7.0 - 7.5	4	14
7.5 - 8.0	1	8
8.0	Nil	1

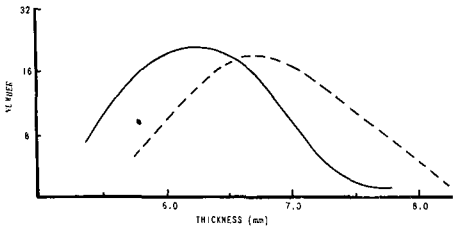

Fig. 1 Graph to show variation in thickness. Unbroken line represents Class II, Division 2; broken line, malocclusions other than Class II, Division 2.

correlation of their individual results. Thereafter, the measurements were made by a third operator, who was unaware of what was being looked for, and whose findings confirmed that the first operators' measurements had not been biased by their preconceived clinical impression.

The data were subsequently analyzed by a member of the Statistical Laboratory of the Department of Mathematics of the University of Manchester.

Findings

Applying the "t" test the figures give conclusive evidence of a difference in mean thickness between the two groups, but no significant evidence of any difference in the mean length or mesiodistal width.

The mean thickness of upper central incisors in Class II (2) cases is 6.33 mm, while in other cases the mean thickness is 6.98 mm. The distribution of variation in thickness (standard deviation) shown in the graph and in Table I is similar in both groups.

Discussion

Considerable interest exists as to why the incisors should take the particular arrangement in Class II (2) and not in other instances where the incisor arrangement is the familiar increased overjet of Angle II (1). Some of the explanations given are:

(1) Soft tissue activity — the high lip line and the greater pressure from the lips than the tongue in the blunt tongue swallow.

(2) In turn, the retroclination and alteration in the angles which upper incisors bear to lowers has been investigated by Backlund who concluded that, for a stable relation to exist between $\underline{/1}$ and $\overline{/1}$, the angle between their long axes should be 135°. An increase in this angle will, he claims, permit the incisors to over-erupt, resulting in a deep overbite.

(3) Logan (1962) believes that the main etiological factor is a genetically determined abnormal axial inclination of the maxillary central incisors.

(4) In a recent symposium on Class II (2) malocclusions, Nicol produced evidence suggesting a difference in the crown/root angulation in Class II (2) cases.

The positions assumed by the teeth in any dentition and their relation to one another, to the soft tissues surrounding them, and to the facial skeleton, are the products of a multiplicity of forces, some active and some passive, some transient and some perpetual, some intermittent and some constant. All the forces vary to a greater or lesser degree from one mouth to the next, both qualitatively and quantita-

tively, and in their orthodontic significance, some occasionally attracting a fashionable but possibly unwarranted proportion of the orthodontist's attention while others, no doubt, remain as yet unrecognized. The assessment of these forces and of their orthodontic significance in any given malocclusion is the essence of orthodontic diagnosis, and in this context the more precise details of tooth form have hitherto received but scant attention.

While no attempt to assign any undue importance to the significance of tooth form is implied here, it is suggested that in some cases it may be sufficient to "tip the balance" for good or evil, and that in selected cases a stable reduction of incisor overbite might be achieved by the artificial adjustment of the palatal contour of upper incisors.

Summary

An investigation is described which confirmed the writers' previous impression obtained from clinical observation, that the crowns of upper central incisors in Class II, Division 2 cases are thinner labiopalatally than those found in other malocclusions.

The etiological significance of their findings is discussed and a possible clinical application is suggested.

Univ. of Manchester

Acknowledgments

Thanks are due to Dr. S. D. Silvey of the Department of Mathematics, University of Manchester, for assistance with the statistical analysis, and to the Department of Medical Illustration, United Manchester Hospitals, for preparation of the graph.

References

Backlund, E. *Europ. Ortho. Soc. Trans.*, p. 277, 1958.

Logan, W. R. *Europ. Ortho. Soc. Trans.*, p. 313, 1959.

Logan, W. R. *Dent. Practit.*, 13: 105, 1962.

Nicol, W. *Trans. Brit. Soc. Ortho.*, p. 25, 1954.

Ridley, D. R. *Dent. Practit.*, 11: 394, 1960.