sciendo DOI: 10.2478/aoj-1994-0023

CASE REPORT No.3

A Class II Malocclusion with Severe Crowding Treated with a "Trial" Non-Extraction Option.

A Long Term Result.

Author:
EDWARD C. CRAWFORD
M.D.Sc. (Melb.) L.D.S. (Vic.)

Fig. 1 (a) Pre-treatment facial photograph.

Fig. 1 (b) Pre-treatment facial photograph.

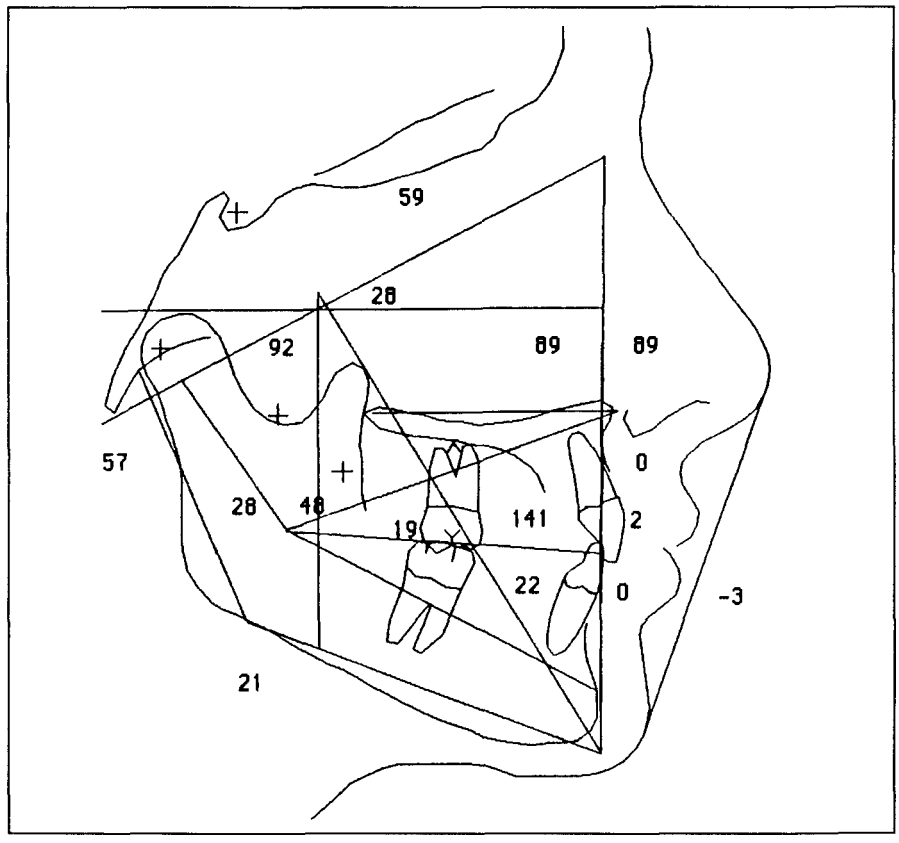

Fig. 2. Pre-treatment cephalometric analysis.

Introduction

This patient's case is of special interest being one of several reviewed many years after treatment ceased.

The degree of upper arch crowding strongly suggested the need for extraction in that arch. Excellent headgear wear obviated that need. The degree of occlusal stability has been remarkable. (Note the long-term A-P position of the upper molars.)

The shape of the lower anterior arch changed significantly during treatment. Interestingly, the new shape has been maintained.

Medical and Dental History

The female patient presented in 1978 as a healthy, but somewhat introverted, 14 year old girl who had no significant medical or dental history.

Facial Features

The patient displayed a well-balanced facial appearance with good position and shape of nose, lips and chin (Fig. 1).

Cephalometric Examination

The cephalometric evaluation revealed a Class I jaw relation with tendency towards a convergent growth pattern (Fig. 2).

Intra Oral Examination

The patient was in the permanent dentition state with all second permanent molars erupted.

The malocclusion was a skeletal Class I although the buccal segments assumed significant Class II relations more severe on the left side (Fig. 3).

The lower dental arch was not crowded but severe crowding existed in the upper anterior segment (Fig. 4). The upper lateral incisors and left cuspid were in crossbite causing a forward mandibular shift (Fig. 5).

Panoramic Radiograph

The panoramic films showed that all teeth were present with no detectable abnormalities.

Diagnosis and Treatment Plan

The main problems centred around the severe crowding of the upper anterior segment.

The upper lateral incisors were crowded lingually into crossbite causing a small forward mandibular shift on full closure. The upper left cuspid was crowded even further to the lingual presenting a significant challenge to alignment.

This crowding was associated with a significant mesial position of the buccal segments, particularly on the left side.

A reasonable treatment plan would have been to extract both upper first premolar teeth to provide room for alignment of the upper anterior segment.

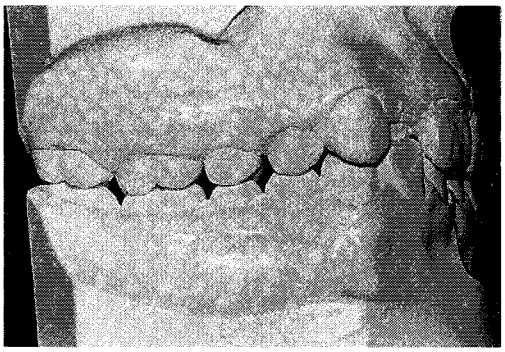

Fig. 3. (a) Pre-treatment buccal occlusion.

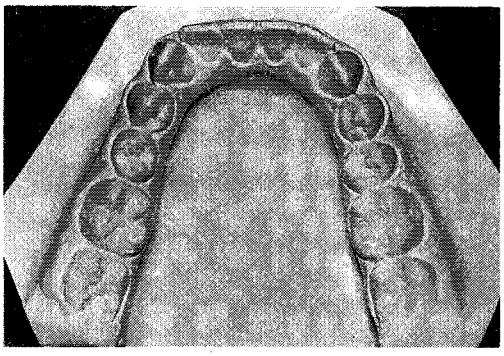

Fig. 4. (b) Pre-treatment occlusal view.

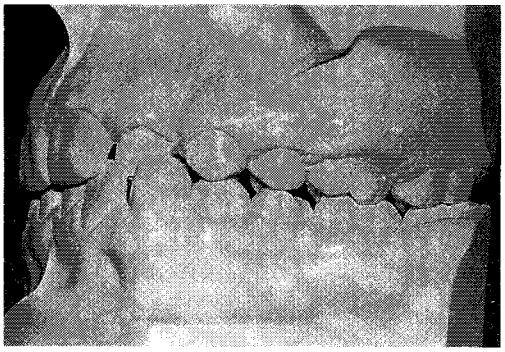

Fig. 3. (b) Pre-treatment buccal occlusion.

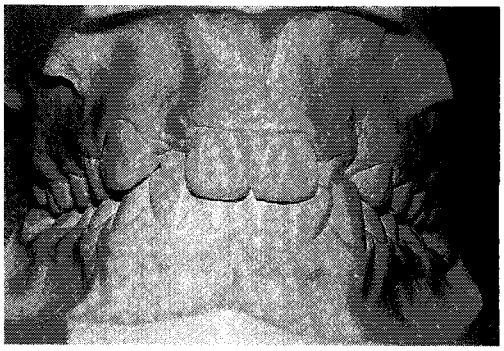

Fig. 5. (a) Pre-treatment crossbite.

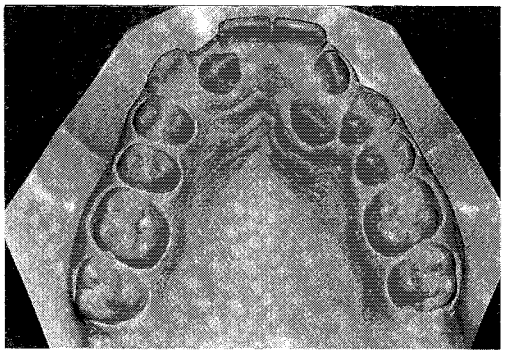

Fig. 4. (a) Pre-treatment occlusal view.

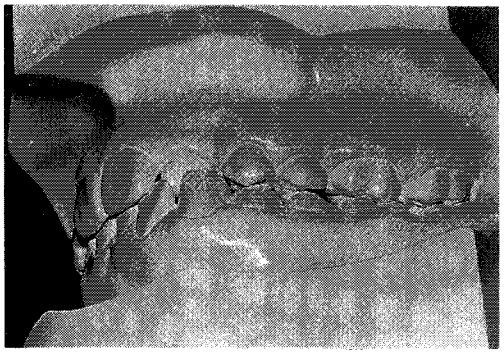

Fig. 5. (b) Pre-treatment crossbite.

An alternative, if tentative, treatment plan was established. This plan was based on a hand and wrist radiograph which indicated that further and significant growth would ensue. This plan included the use of a headgear in order to distally move both upper first permanent molars into their correct positions.

This plan also included possible extraction of the upper left second permanent molar to facilitate more efficient distalization of the adjacent first permanent molar.

The final treatment plan was:

i) no extractions prior to active treatment

ii) headgear (directional) in order to move the upper molars distally

iii) fixed appliances. It was intended to initiate this phase of treatment with appliances in the upper arch only. Lower appliances would be fitted when, and if, the need arose.

The success of this plan was dependent upon the patient's co-operation in wearing headgear.

Fall-back treatment plans included extraction of one or both upper second molars or extraction of both upper first premolars.

Sequence of Appliances

1. Headgear (Combi) to distalize upper first permanent molars - 9 months.
2. Fully banded upper Edgewise appliance (Preadjusted: Andrews' prescription) - 12 months.
3. Lowers added (fixed appliance with full pre-adjusted attachments, Andrews' prescription) - 9 months.

Treatment Commenced

October 1978 (14.7 years).

Treatment Ended

May 1981 (17.1 years).

Active Treatment Time

30 months.

Post-treatment Records

May 1981 (17.1 years).

Retention

1. Maxillary:
   - removable retainer
   - Headgear worn for 6 months after debanding
2. Mandibular:
   - Dohner splint.

Long-Term Records

February 1994 (29.11 years).

Treatment Milestones

October 1978: Start headgear (combined cervical and highpull).

April 1979: Upper first molars have moved into Class I.

July 1979: Band all upper teeth (except the upper right permanent canine) level and align.

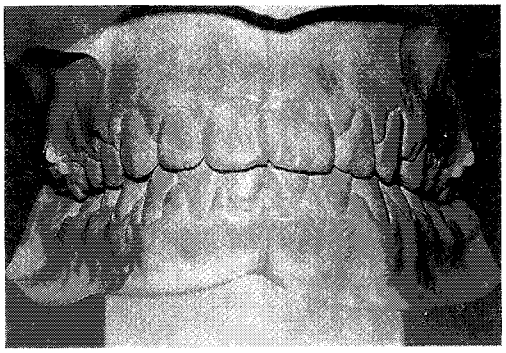

Fig. 6. (a) Post-treatment anterior view.

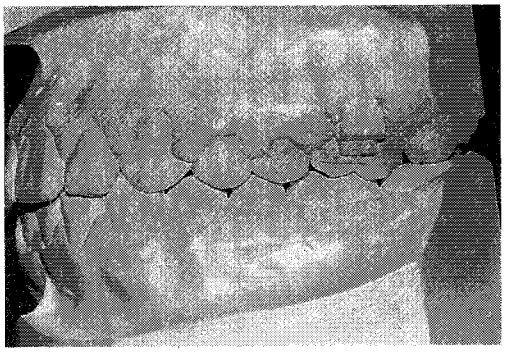

Fig. 7. (b) Post-treatment buccal occlusion.

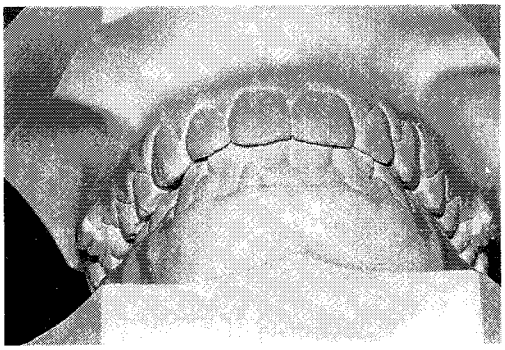

Fig. 6. (b) Post-treatment anterior view.

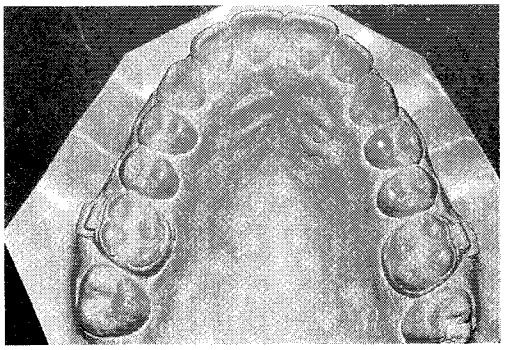

Fig. 8. (a) Post-treatment occlusal view.

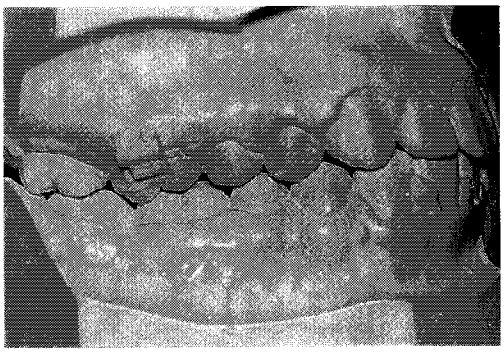

Fig. 7. (a) Post-treatment buccal occlusion.

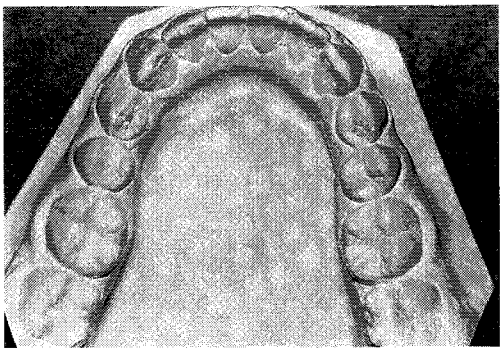

Fig. 8. (b) Post-treatment occlusal view.

September 1979: Retract upper premolars (0.016 round stopped archwire).

November 1979: Complete premolar retraction. Start to move upper anteriors to right.

February 1980: 0.016 x 0.016 square wire, with coil spring to open space for the upper right permanent canine.

March 1980: Start the upper right permanent canine movement (elastic thread).

April 1980: Continue the upper right permanent canine movement (0.016 x 0.016 square looped archwire). Finish headgear.

June 1980: Lower anteriors (on left side) moving forward. Decision made to band lower arch.

August 1980: Band/bond lower arch, level and align.

December 1980: Resume headgear. Interproximal reduction: lower incisors.

February 1981: Class II elastics - right side (1/4 inch, 4 oz).

March 1981: Supervise retention, then phase out; extraction of third molars and post retention observation.

May 1981: Deband and retain.

Treatment Results

Immediate

Dental:

i) good anterior dental relation (Fig. 6)

ii) good buccal occlusion (with slight tendency towards a Class II relation on right side, Fig. 7)

iii) severe distal root tipping of upper first molars (effect of headgear and Andrews' Prescription)

iv) good alignment of dental arches (Fig. 8).

v) note change in lower anterior archform.

Facial

i) maintenance of good facial proportions and good lip fullness/ balance (Fig. 9).

Radiographs

Orthopantomogram

i) good root alignment except the upper first permanent molars (distal root tip)

ii) negligible root resorption (except the upper right permanent lateral incisor and the lower left permanent canine)

iii) good bone height and quality

iv) third molars heading towards impaction.

Cephalogram (Fig. 10)

i) forward growth

ii) no mandibular plane opening

iii) slight proclination of lower incisors

Fig. 9 (a) Post-treatment facial photograph.

Fig. 9 (b) Post-treatment facial photograph.

Fig. 9 (c) Post-treatment facial photograph.

iv) establishment of good inter-incisal angle

v) maintenance of good profile

vi) upper molars moved significantly distally.

Long-term (13 years post-treatment)

Retention ceased May 1986. Last records taken February 1994.

Dental:

i) occlusion maintained close to end of treatment position (Fig. 11)

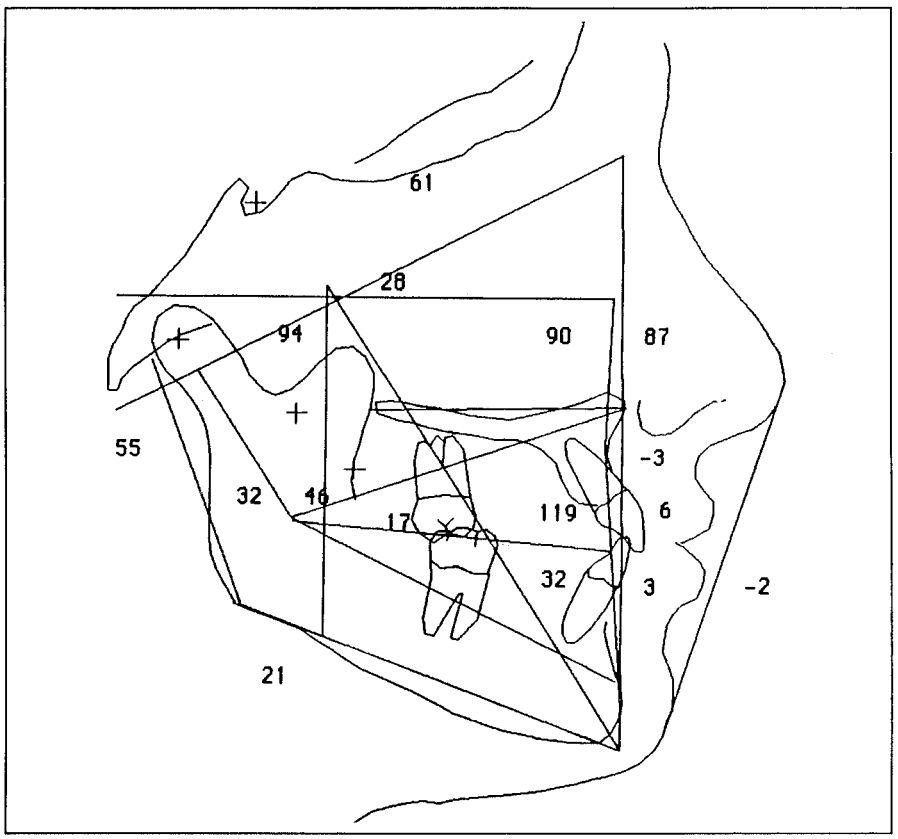

Fig. 10. Post-treatment cephalometric analysis.

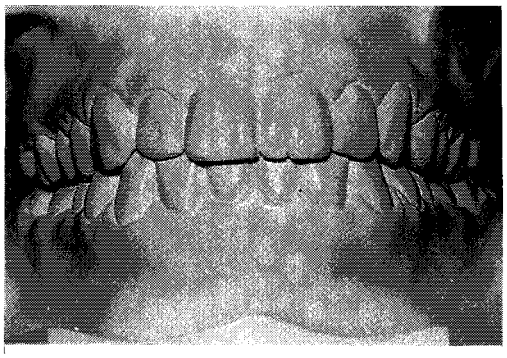

Fig. 11. (a). Long term anterior view.

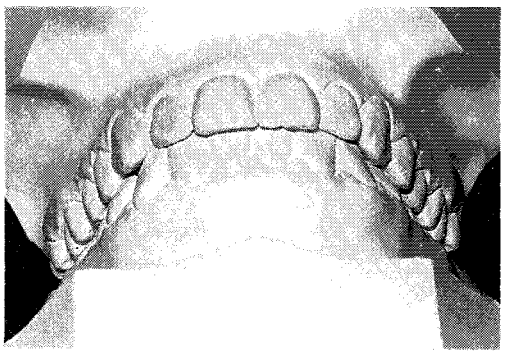

Fig. 11. (b). Long term anterior view.

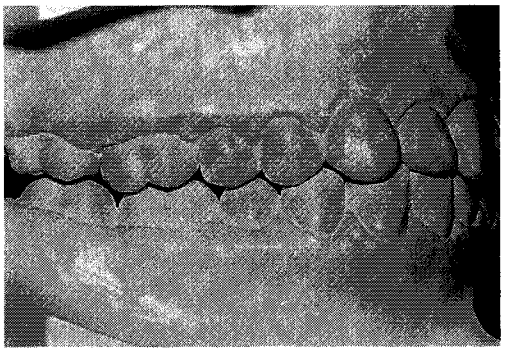

Fig. 12. (a). Long term buccal occlusion.

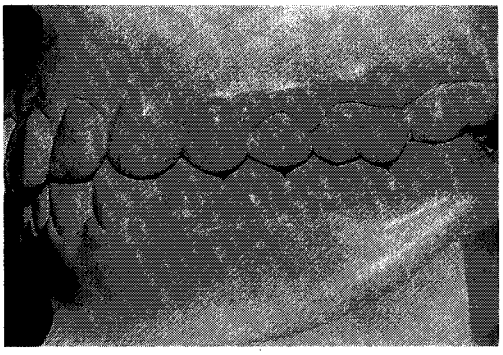

Fig. 12. (b). Long term buccal occlusion.

Fig. 13. (a). Long term facial photograph.

Fig. 13. (c). Long term facial photograph.

Fig. 13. (b). Long term facial photograph.

ii) buccal segments slightly improved (Fig. 12)

iii) alignment of both arches maintained.

Facial:

i) good facial proportions, balance and profile (slightly less lip fullness) (Fig. 13).

Radiographs:

Orthopantomogram

i) root alignment has remained good

ii) the upper right first permanent molar and the upper left first permanent molar root alignment has improved but it is still not ideal

iii) Note some angular bone loss in the lower right lateral incisor area.

Cephalogram (Fig. 14)

i) further growth (expressed vertically)

ii) mandibular plane: opened slightly

iii) upper molars maintained position

iv) upper and lower incisors have erupted and move slightly lingually

v) lips retracted somewhat.

Comment

Significant molar movement was achieved through excellent headgear wear by the patient. This facilitated decrowding and alignment of the upper anterior segment without recourse to extraction of permanent teeth; except for the third molars removed during the retention phase.

The long-term stability of the upper molar teeth was excellent as was the stability of the occlusal correction overall.

The patient's excellent co-operation with the removable retention plates also contributed to the success of the case.

The change in lower dental arch shape and its long-term stability can be attributed to the elimination of the anterior cross bite and the establishment of a new environment.

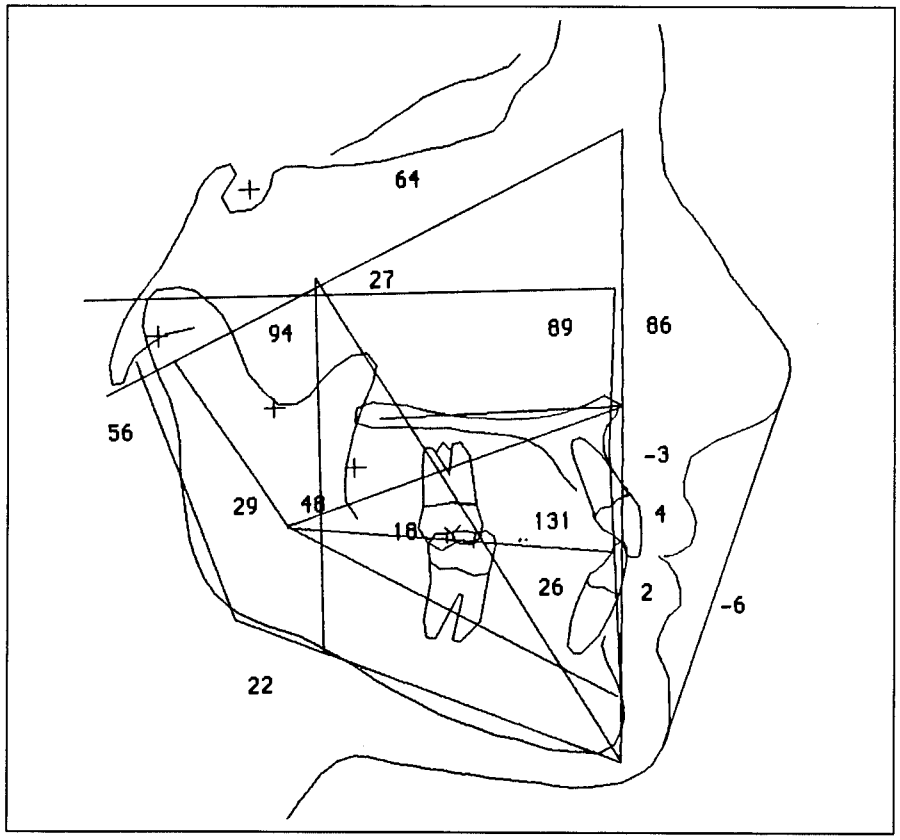

Fig. 14. Long term cephalometric analysis.

Addresses for Correspondence and Reprints:

Dr G. J. Moore
28 Kensington Road
Rose Park, South Australia 5067

Dr R.J. Pedley
202 Northpoint Plaza
Chandler Street, Belconnen ACT 2617

Dr E.C. Crawford
15 Collins Street
Melbourne, Victoria 3000