Second Molar Germectomy and Third Molar Eruption

11 cases of lower second molar enucleation

Georges Gaumond

Eleven cases followed from enucleation of the unerupted lower second molars through third molar eruption. While results were generally good, three presented third molar malpositions requiring further treatment.

KEY WORDS: • CROWDING • ENUCLEATION • MOLAR, SECOND • MOLAR, THIRD •

Only the third molar lies distal to the second, erupting several years later if at all. The early extraction of second molars usually allows natural and satisfactory closing of the extraction space, as the third molar slowly migrates into position.

Contrarily, if a bicuspid is removed in a case of slight or moderate dental crowding, natural closure of the residual space is usually incomplete and unsatisfactory. Closure requires orthodontic intervention, usually longer and more complex than required for a slight distal movement of the first permanent molar, which often occurs spontaneously.

Early extraction of the first permanent molar would also allow a lengthy period for mesial migration of the second and third permanent molar buds, but in contrast to the second permanent molar, it must be done at a much earlier age. It is much more difficult to predict the degree of future crowding and its significance at such an early age, and the absence of molar occlusion can compromise function for several years.

The special anatomical position of the second molar, and the therapeutic implications arising out of it, have attracted the attention of orthodontists for some time, especially in England (HALDERSON 1959, WILSON 1964, RIX 1966, CRYER 1967, WILSON 1971 AND 1974, RICHARDSON 1975 AND 1977, LIDDLE 1977).

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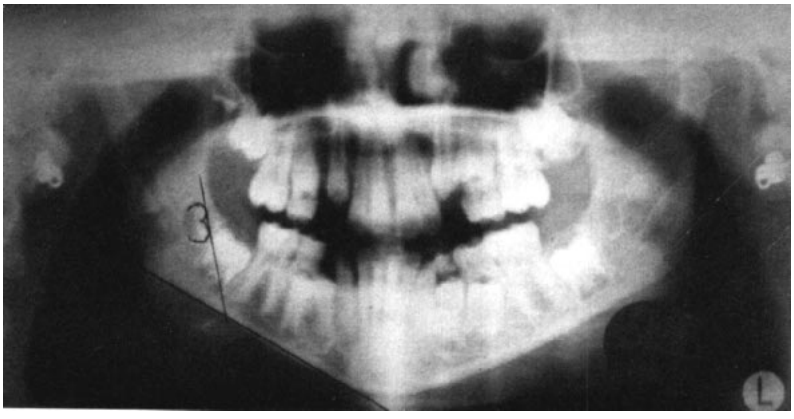

Fig. 1 The angle between the line through the tips of the cusps and the mandibular plane is used to evaluate the inclination of tooth buds.

This study is focussed chiefly on confirming whether the expected migration of the third molar truly occurs satisfactorily.

— Method —

This report is based on the first eleven cases treated by enucleation of the second molar buds which were followed through to complete eruption of the third molars.

Removal of the tooth bud was done as soon as the presence of a non-ectopic and sound third molar germ was confirmable by radiography.

Neither original position nor inclination of the third molar buds was considered in patient selection. Nonetheless, to assess the influence of inclination and possible eventual modifications, the angle formed between a line passing through the points of the lingual cusps of the third molar and the mandibular plane tangent to the pregonial and post-symphyseal convexities on an orthopantogram was measured (Fig 1).

Total space deficiency in the arch, directly measurable or calculated (Moyers analysis plus extrapolation from the widths of erupted cuspids and bicuspids) was between 4mm and 8mm.

Distal movement of the first permanent molars was usually achieved as a result of the associated occlusion and crowding.

In one patient (class III, case A), a headgear was applied to the mandibular first molars.

In the ten remaining patients, all class I or II malocclusions, the distal movement was carried out in the three phases.

Phase I — a lingual arch wire attached to bands on teeth 36 and 46 or 75 and 85, touching the lingual surfaces of the mandibular incisors, was placed in the mixed dentition stage in order to prevent physiological mesial migration of the first molars after exfoliation of the deciduous teeth (SINGER 1974 AND ODOM 1983).

Phase II — removal of the lingual arch wire at the time the germectomy of 37 and 47 was performed.

Phase III — eruption of the bicuspids and cuspids contributed to the distal movement of the first molars. When

mechanical action was necessary to perfect the distal movement of the first molars, it was achieved either by removable appliance or simple fixed appliance.

— Results —

The 22 extractions of lower second molars described above produced —

- 19 satisfactory or very satisfactory positionings of the third molars
- 2 imperfect positionings (Cases D and K)
- 1 mediocre result (A)

Radiographs of these cases are presented in figures 2-12.

— Discussion —

Justification of the technique presented here goes beyond simplifying the treatment. In dental arch crowding, it is typically necessary to extract one tooth in each quadrant. Paradoxically, the less the dysharmony, the greater the difficulty and the more complex and prolonged is the orthodontic closure of the residual spaces.

In this approach, sufficiently early removal effects the closure of space not by mechanical means, but by utilizing the natural phenomenon of mesial migration. Removal of the second molar tooth bud instead of the traditional extraction of a bicuspid achieves this objective. As the third molar migrates slowly forward, the first molar also spontaneously moves distally under the influence of the eruption of the permanent cuspids and bicuspids (Liddle 1977).

These results are similar to those reported by RICHARDSON (1975 AND 1977), who observes that after extractions of lower bicuspids there is a reduction in the number of cases of third molar impactions; but after extractions of second molars there are no impactions. Our results also agree with those of HALDERSON (1959) AND LIDDLE (1977), who report that third molars do erupt into occlusion.

As with WILSON (1964, 1971 AND 1974) however, our results show that positioning of third molars is not absolutely certain.

For this Author, after second molar extraction, 87% of third molars were in positions classified as excellent, very good, or good. Indeed, case A (Fig. 2) shows an aggravation of axial deviation of 48 after extraction of 47. Does this have to do with an "unforeseeable" phenomenon peculiar to the third molar as suggested by BROWN (1974), or has the tooth bud been tilted accidentally during the extraction of 47 ?

This observation, and the possibility of tilting of tooth buds 38 and 48, have caused us in our most recent cases to systematically straighten these tooth buds when they reveal a somewhat severe inclination (over 30° angle between third molar cusps and the mandibular plane). We are not yet able to show cases with complete eruption of third molars after straightening of the tooth buds; however, radiographs one year after this minor surgery show the germs to be developing favorably (Fig. 13).

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Fig. 2 *pages 80 and 81*

Case A, Class III, girl 10 years of age at the time of removal of tooth buds. Lower first molars moved distally with extraoral force. 48 is more severely tipped following extraction, and does not upright adequately. Final radiograph at age 16.

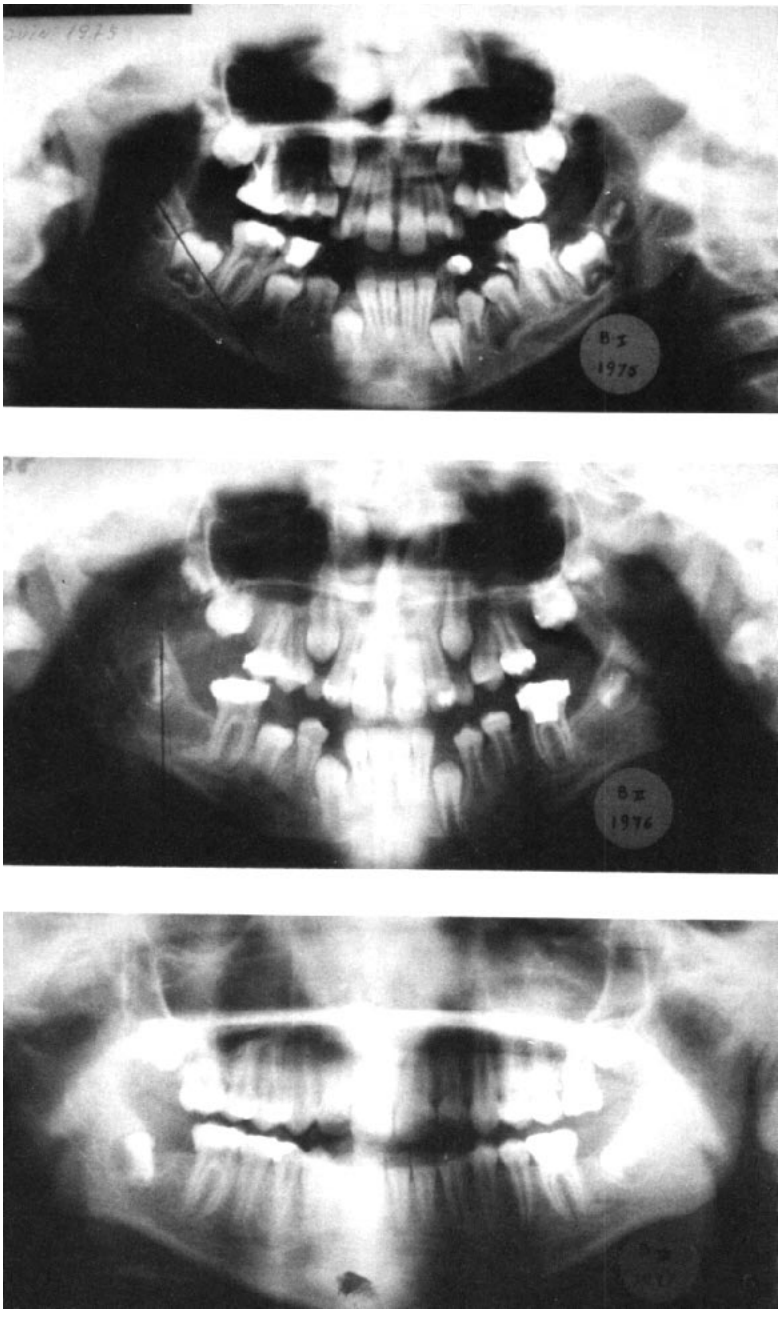
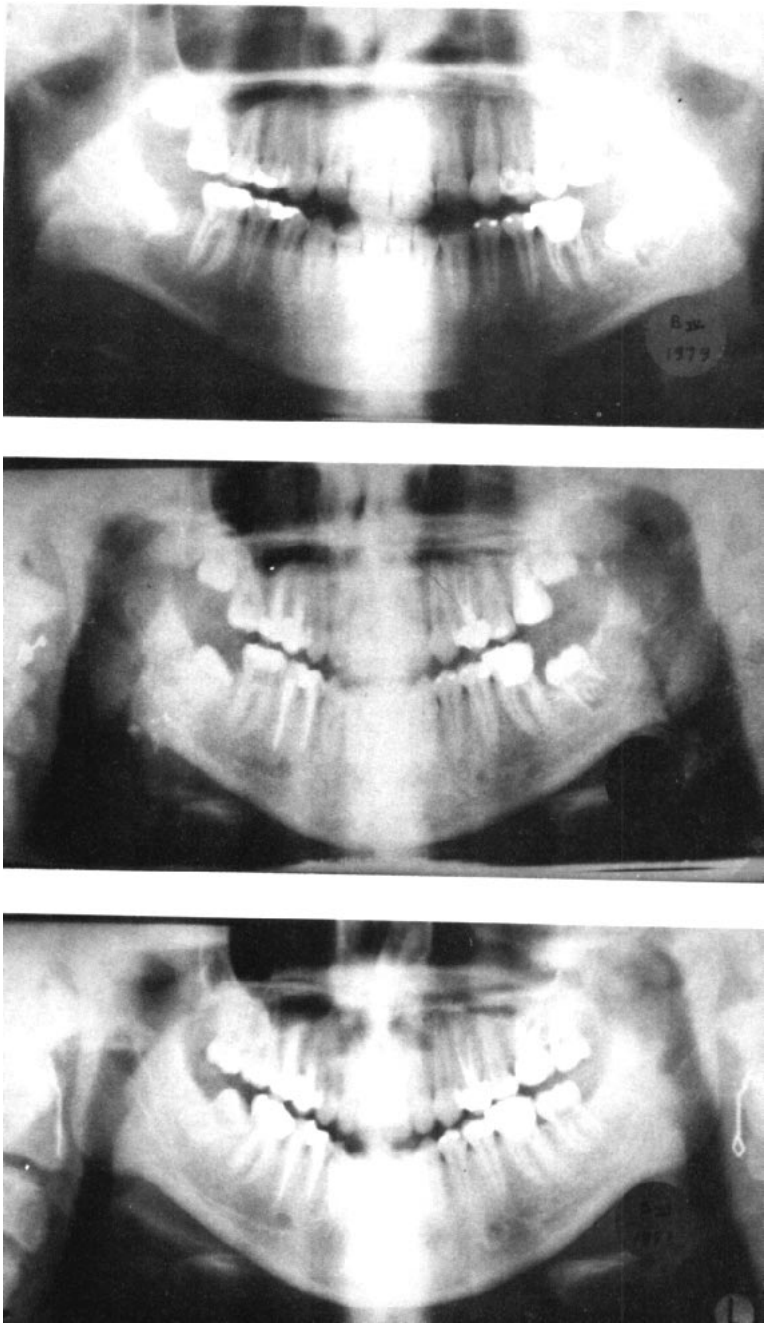


Fig. 2, legend page 79



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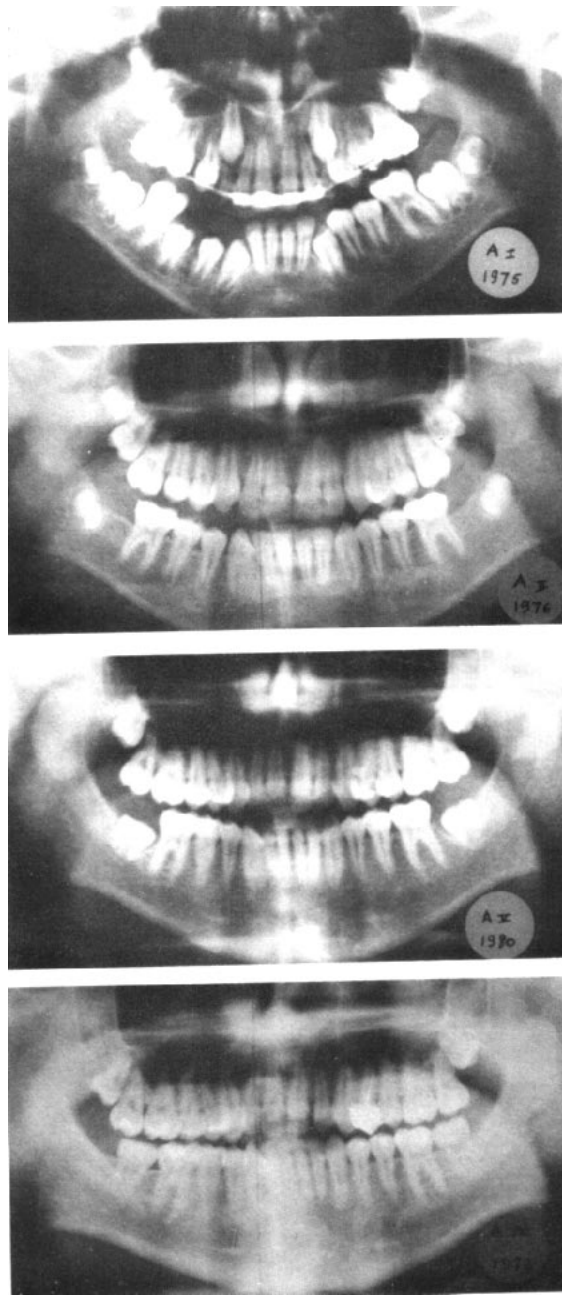

Fig. 3 Case B, Class I, boy 11 years old at the time of second molar removal. Final radiograph, age 18.

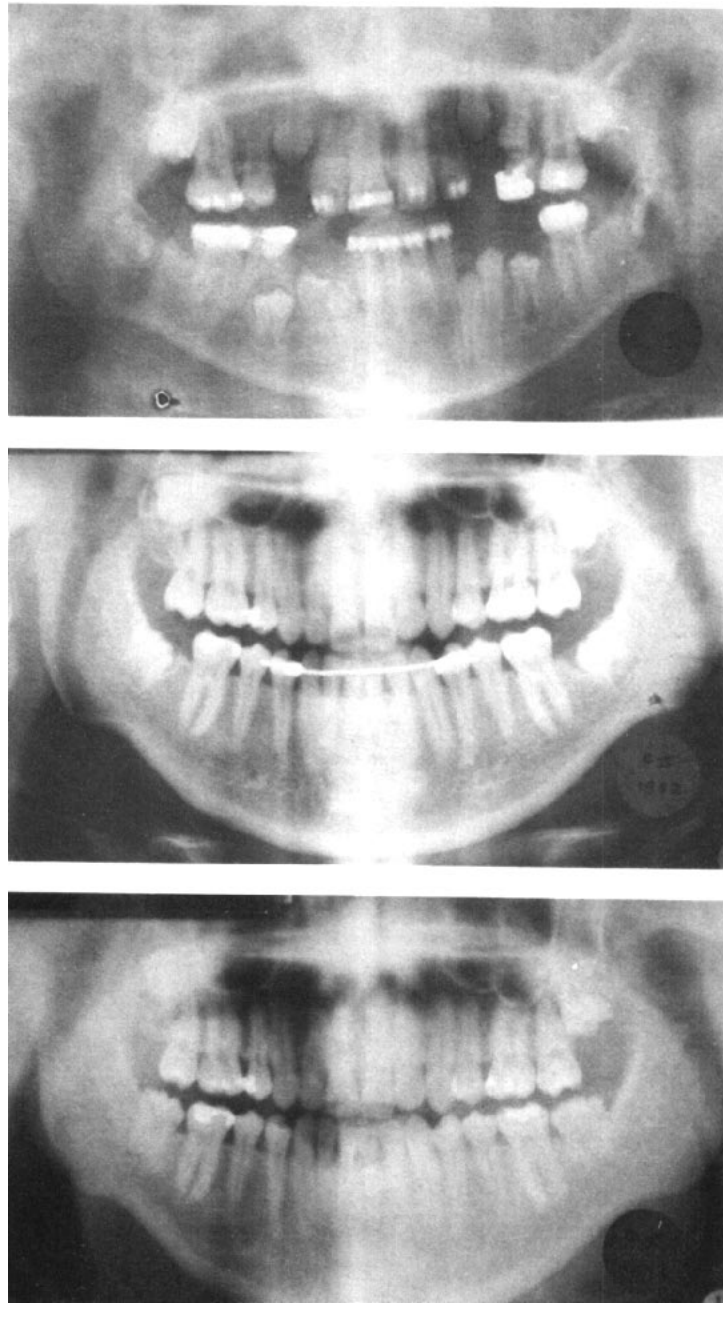

Fig. 4 Case C, Class II, boy 12 years old at time of tooth bud removal. Final radiograph, age 18.

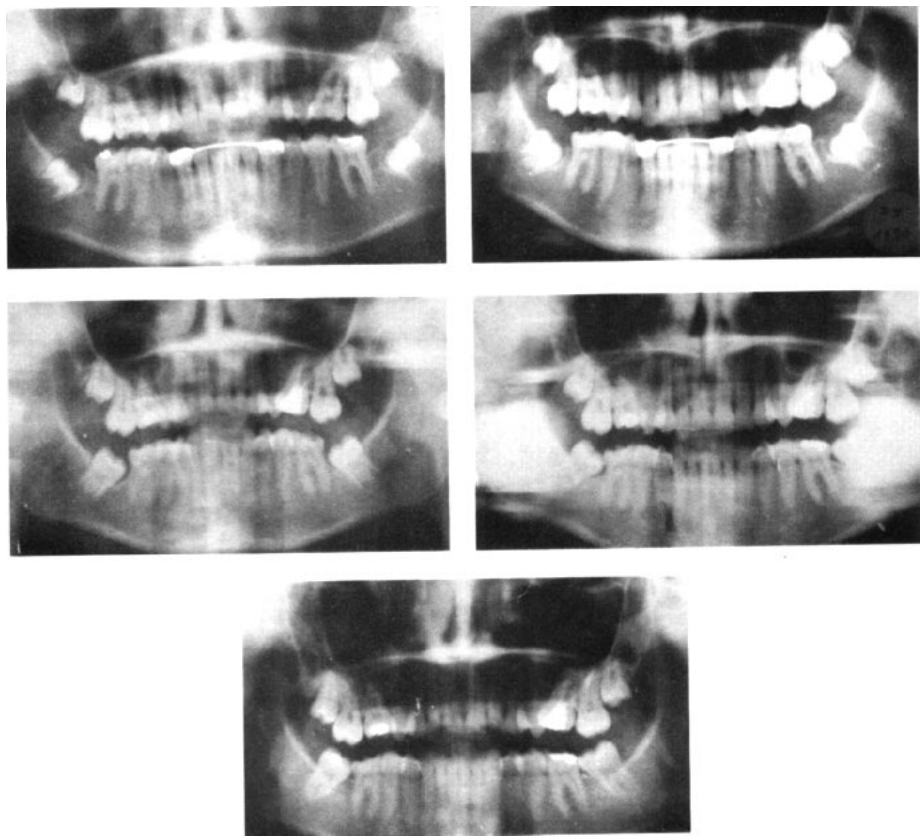

Fig. 5 Case D, Class II, girl 12 years old at time of second molar extraction. Final radiograph, age 19, shows axis of tooth 48 continuing to improve even after closure of the extraction space.

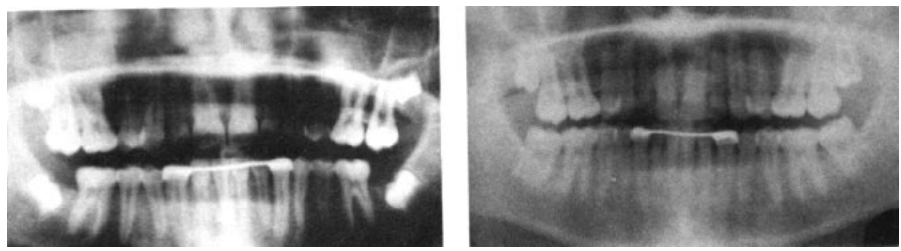

Fig. 6 Case E, Class II, boy 12 years old at the time of tooth bud removal. Final radiograph at age 16.

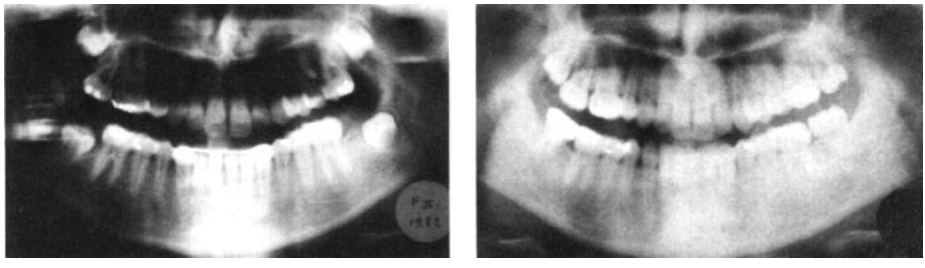

Fig. 7 Case F, Class I, girl 11 years at time of tooth bud removal. Final radiograph, age 18.

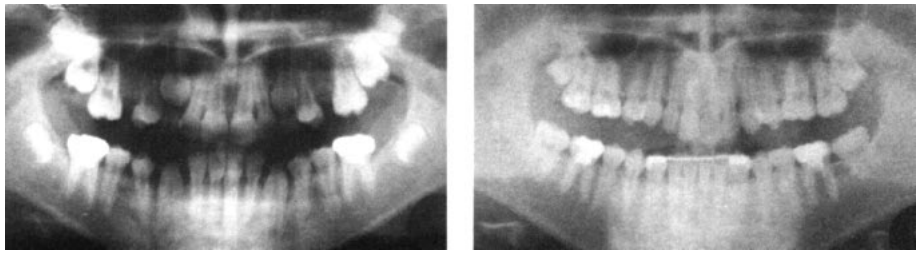

Fig. 8 Case G, Class I, boy 10 years old at the time of tooth bud removal. Final radiograph at age 16.

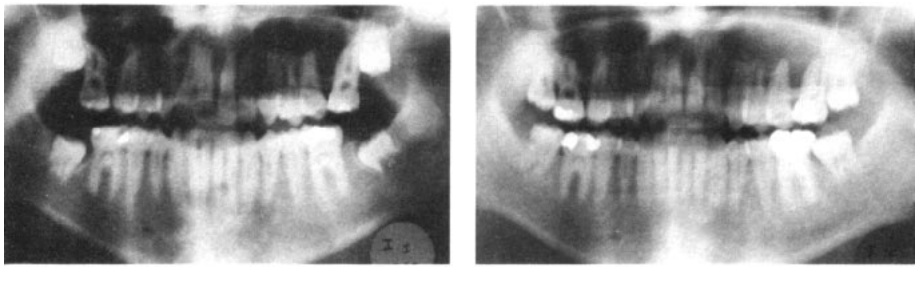

Fig. 9 Case H, Class I, girl 11 years old at time of tooth bud removal. Final radiograph, age 16.

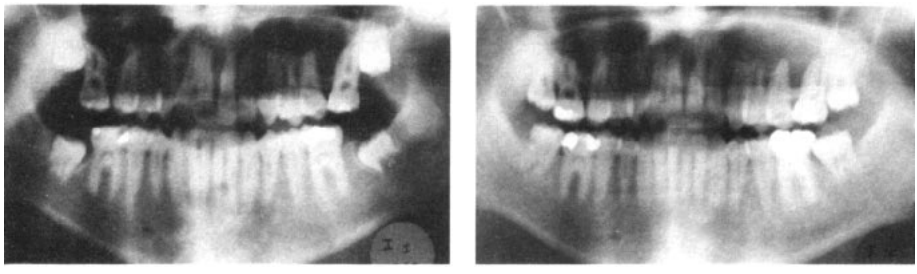

Fig. 10 Case I, Class I, boy 12 years at time of tooth bud removal. Final radiograph, age 17.

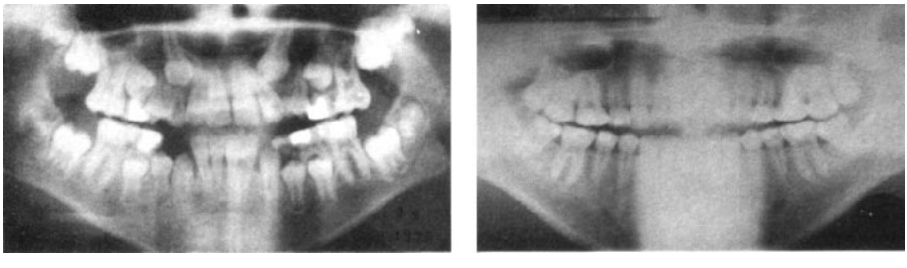

Fig. 11 Case J, Class I, girl 10 years at time of tooth bud removal. Final radiograph, age 18.

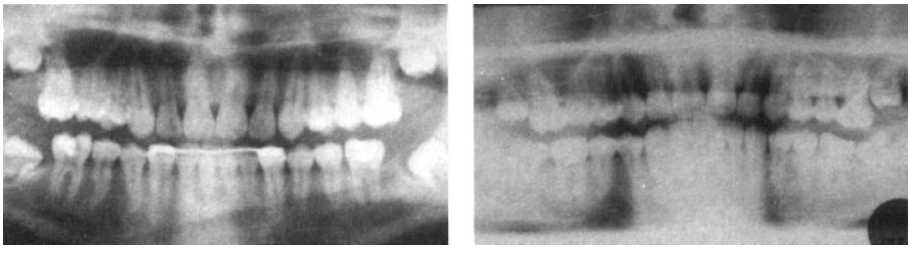

Fig. 12 Case K, Class I, boy 10 years old boy at time of tooth bud removal (upper second molars were also removed). Final radiograph, age 18.

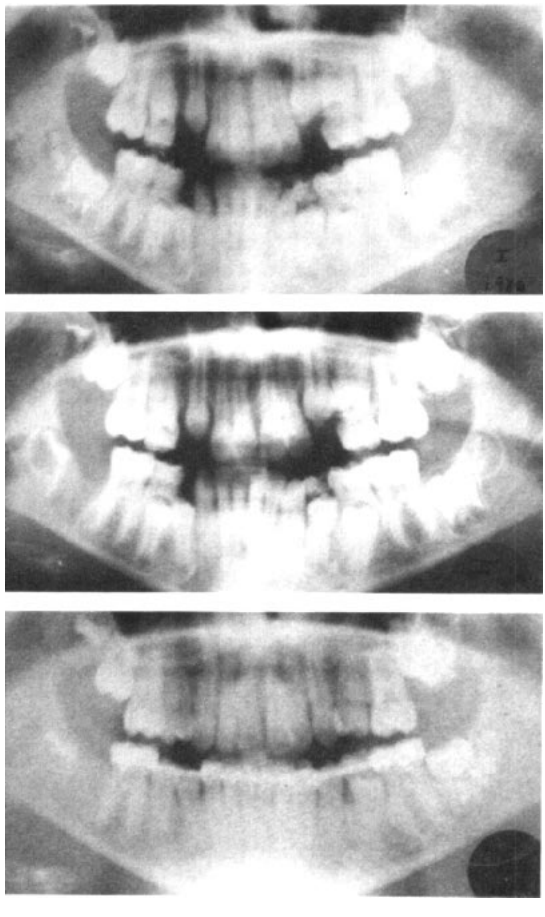

Fig. 13 Surgical intervention to upright the unerupted third molar germ at the time of second molar extraction. Final radiograph one year later.

— Conclusion —

The results of this study indicate that in every case of *light or moderate dental arch crowding*, the correction in the mandibular arch is done more easily by tooth bud removal of the second mandibular molars than by extraction of bicuspids.

This correction is facilitated by early placement of a lingual arch wire to prevent mesial migration of first molars at the time of exfoliation of the deciduous teeth, or due to proximal caries of the deciduous teeth.

The residual space is always closed, to some extent by spontaneous or mechanically assisted distal movement of the mandibular first molars, and to a greater extent by spontaneous mesial migration of the third molars.

The final axial inclination of the third molars is generally good; nevertheless, the possible need for straightening these teeth must be considered.

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