Correction of a Class I Skeletal Open-Bite Malocclusion

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A female patient 14.5 years of age presented for orthodontic consultation. Clinical examination revealed a Class I open bite with no interarch tooth contact from left first premolars to right first premolars, inadequate lower arch length and upper incisor procumbency (Fig. 1).

Soft-tissue evaluation revealed a strained lip closure (Fig. 2) and an active tongue thrust during a swallowing habit. Hard tissue cephalometric evaluation may be interpreted as "skeleton open bite." (Fig 3). The treatment plan of choice included the removal of the four first premolar teeth. This decision was not dictated by the open bite, but rather by the requirements for improved facial esthetics (convex profile with poorly defined chin), improved breathing pattern (lip closure), and posttreatment stability (lower arch form).

The treatment began not with mechanotherapy, but with muscle therapy. Patient motivation was high and tongue exercises resulted in a diminution of the open bite. Mechanotherapy followed this positive sign of patient cooperation. Total treatment time including tongue retraining before treatment, mechanotherapy, and a "testing for relapse" period toward the end of treatment was 27 months. Retention consisted of a maxillary Hawley worn for a period of 6 months. No lower retention was utilized.

A decided improvement in occlusal contact relations and facial esthetics has been achieved. Posttreatment headplate shows that the skeleton has remained

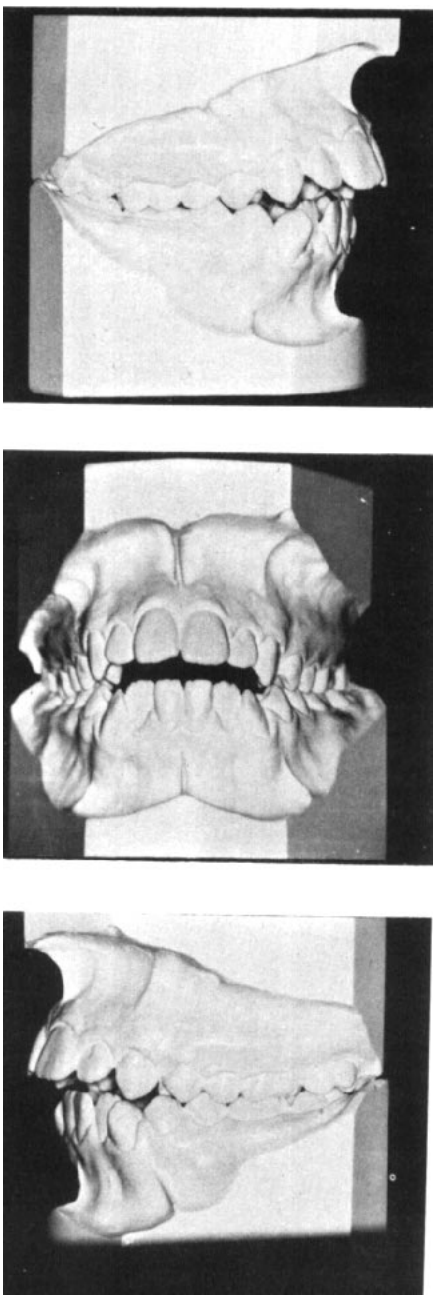

Fig. 1 Pretreatment casts.

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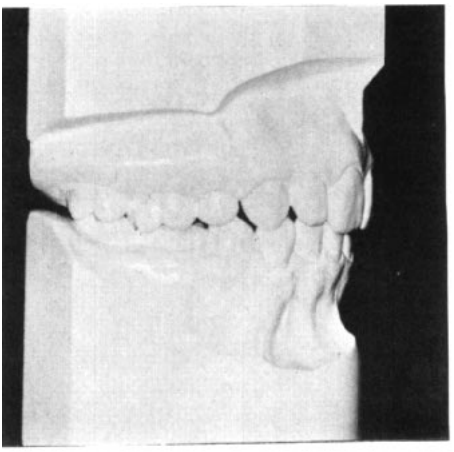
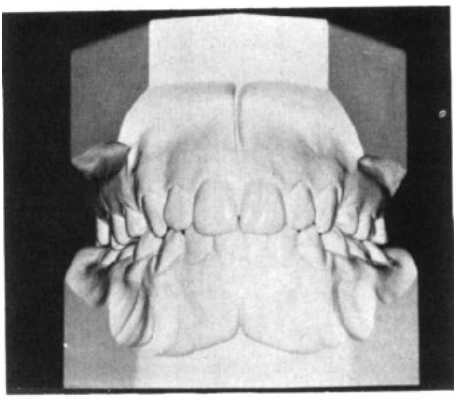
Fig. 2 Pretreatment photographs. Note poor chin definition.

Fig. 3 Pretreatment headplate.

Fig. 4 Postretention headplate.

Fig. 5 Postretention photographs. Note improved chin definition.





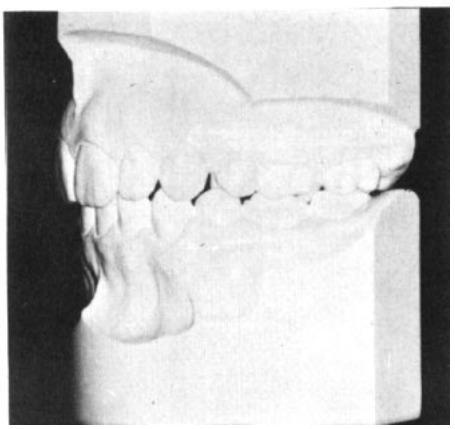


Fig. 6 Postretention casts.

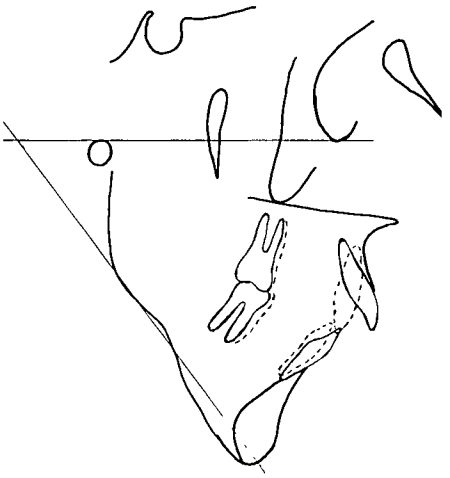


Fig. 7 Before and after headplate tracing superposed on SN, registered at S.

unchanged, but the open bite is gone (Figs. 4 and 5). Posttreatment records represent the corrected malocclusion 18 months postretention (Figs. 6 and 7).

Discussion

The term "skeletal open bite" was coined by Subtelny[1] in 1964. He, as well as White[2] in 1957, demonstrated a positive relationship between skeletal patterns and open bite for some patients. This concept has grown in popularity over the years,[3-5] perhaps to lighten the burden of treatment failures.

The second factor in open-bite problems, but by no means second in importance, is the behavior of soft tissue, principally the tongue. Whether the tongue plays an active or passive role in the etiology of open bite has been an unresolved subject of controversy for many years. There is no need to rehash the arguments regarding the relative success or failure of tongue retraining, either by muscular or mechanical means. Each side is capable of providing evidence to support its particular point of view.[6-9]

It is our opinion that the combined influence of form (skeletal pattern) and

function (tongue, finger, lips) contributes to the "degree" of open bite. We do not, however, support the contention that open bite is created by "jaws growing apart." It has not been our experience to observe normal tongue size, position and/or function in open-bite cases, but we have observed that open bites come in a variety of skeletal patterns. The nature of this skeletal pattern, as reflected in the relationships between gonial angle, mandibular plane, palatal plane, etc., influences only the "degree" of final postretention vertical correction, once *soft-tissue* factors are no longer acting in a detrimental way.

With regard to the growing popularity of surgical intervention, we are in full agreement that in those cases where orthodontic correction will not satisfy the esthetic requirements, or where the open bite is associated with gross craniofacial malformations, surgical orthodontics is the treatment of choice.

The case report presented in this paper will serve, we hope, as a reminder that old-fashioned orthodontics is still applicable to solve moderate open-bite problems.

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