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Case Report

Early treatment of a Class II Division 1 retruded mandible: Long-term stability

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ABSTRACT

This case report describes the orthopedic/orthodontic treatment of a skeletal Class II retruded mandible in a 10-year-old girl. A two-phase treatment was started with a Kloehn cervical headgear in the late mixed dentition for 1 year followed by fixed appliance for 2 years. Remarkable profile changes and smile aesthetics were achieved. The 10-mm overjet was mostly reduced by growth modification leading to an excellent functional occlusion. Long-term stability at 11 years 5 months posttreatment is reported. Controversial issues such as early versus late Class II treatment, headgear versus functional appliance, and variability in treatment responses are discussed.

1. Introduction

Class II malocclusions are the most common problems treated in orthodontic practices. Despite long experience and excessive published findings, treatment timing in patients who are still growing and the optimal orthopedic appliance for the various Class II malocclusions remain controversial. This case report illustrates a patient who underwent early management of a severe skeletal Class II retruded mandible with a headgear followed by fixed appliance.

2. Diagnosis and etiology

The patient was a girl, age 10 years 3 months, with a chief complaint of protruded upper teeth and unpleasant smile. Her medical history was non-contributory. Dental history included routine dental evaluations and her oral hygiene was good. The probable cause of her malocclusion was a combination of genetic and developmental factors.

The patient had a convex profile with mandibular retrusion and everted lower lip. The nasolabial angle was normal, but the throat length was short. From a frontal view, the face appeared well balanced and symmetrical. Lips were incompetent with an excessive vertical exposure of the maxillary central incisors at rest. The philtrum height was shorter than the commissure heights resulting in a reverse upper lip line. Upon smiling, lip elevation and vertical display were normal, but the central incisors appeared to protrude outward (Fig. 1).

Intraorally, she was in the late mixed dentition stage of development with presence of second primary molars and the upper right first primary molar. She had a Class II Division 1, edge-to-edge molar relationship. The overjet was 10 mm and the overbite 50%. The maxillary arch form was V-shaped with a high palatal vault. The transpalatal width of the first molars was 30 mm, which is smaller than the normal width of 33.7 mm [1]. The mandibular arch form was ovoid. There was no arch length deficiency in both arches. A 1 mm maxillary midline diastema was present. Dental midlines were aligned and coincident with the facial midline (Figs. 2 and 3).

The panoramic radiograph showed normal development and a full complement of teeth, including third molars. Upper canines had erupted ahead of upper second premolars and lower second molars were close to eruption ahead of lower second premolars (Fig. 4).

Cephalometric analysis revealed a severe skeletal Class II anteroposterior relationship evidenced by an ANB (point A, nasion, point B) angle of 8° and a Wits appraisal of 5 mm. The mandibular plane angle was normal with a Frankfort mandibular plane angle (FMA) of 26°. The increased sella nasion–mandibular plane (SN-MP) angle of 46° was mainly due to a canted SN plane. The mandibular incisors were normally inclined whereas maxillary incisors were slightly proclined. Soft tissue analysis confirmed lower lip and chin retrusion with a decreased value of the Holdaway line to the tip of the nose (Figs. 5 and 6, Table 1). The skeletal age as assessed from the lateral cephalometric radiograph was 12 years 2 months (Fig. 5). This was evaluated

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Fig. 1. (A–C) Pretreatment facial photographs.

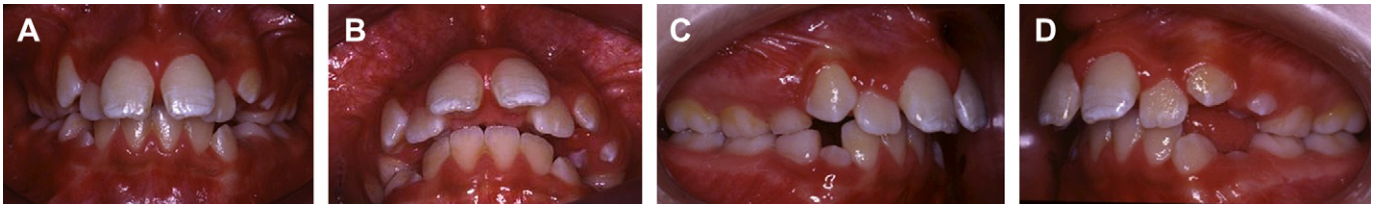

Fig. 2. (A–D) Pretreatment intraoral photographs.

according to the method of Hassel and Forman combining the observations of the changes in the hand-wrist (Fishman method) and the changes in the cervical vertebrae during skeletal maturation [2].

3. Treatment objectives

The main objective in the treatment of this malocclusion was to align the teeth and correct the upper incisor protrusion, which was the patient's chief complaint. The retruded mandible had to be addressed to improve facial aesthetics and help achieve an ideal overbite and overjet relationship. This would also help reduce lip incompetence and enhance smile aesthetics.

4. Treatment alternatives

Two treatment alternatives were considered. The first required waiting until full eruption of the permanent dentition (excluding

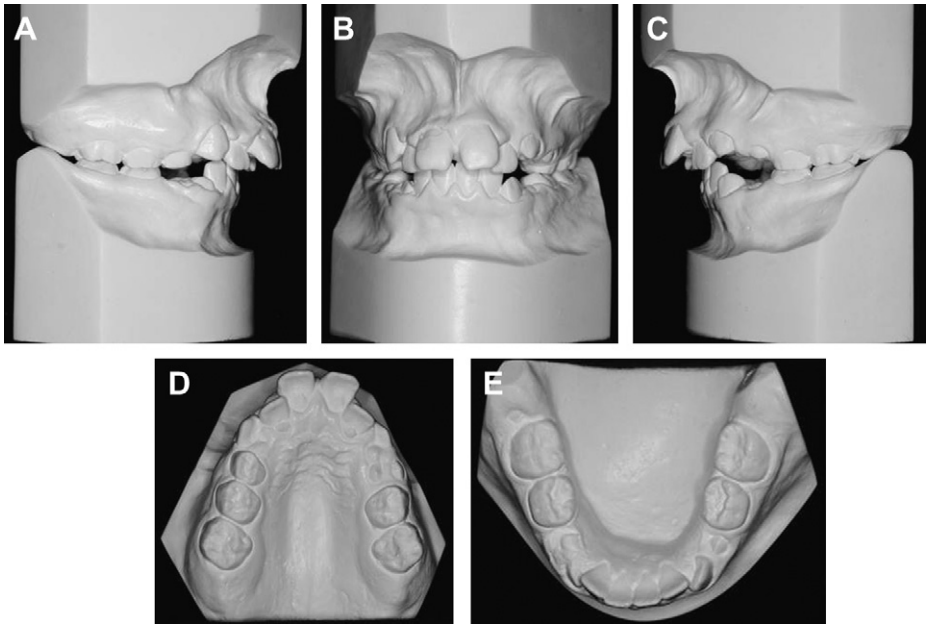

Fig. 3. (A–E) Pretreatment dental casts.