Facemask Therapy and Lower Incisor Extraction in Mild Skeletal Class III Malocclusion

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ABSTRACT

Class III malocclusions may be made up of different combinations of skeletal and dentoalveolar components. Consideration of the various components is essential to understanding the underlying causes of the discrepancy which, in turn, is essential in choosing the appropriate treatment. Protraction of facemask therapy has been successful in the early treatment of Class III patients with maxillary deficiencies. However 25 to 33% of the treated patients reverted to an anterior crossbite when they reach their pubertal growth spurt. This case report describes management of mild Class III malocclusion with facemask therapy to address deficient maxilla and lower incisor extraction to relieve lower anterior crowing and proclination. Achieving positive over jet prevents relapse which are high in cases of Class III malocclusions with anterior edge to edge bite.

Keywords: Skeletal Class III, Facemask, Lower incisor extraction, Orthodontics.

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INTRODUCTION

Class III malocclusions may be made up of different combinations of skeletal and dentoalveolar components. Consideration of the various components is essential in understanding the underlying causes of the discrepancy which, in turn, is essential to choosing the appropriate treatment. According to Guyer et al the most frequent Class III pattern is a normal maxilla with prognathic mandible. Approximately 25% Class III patients in their study had a deficiency in the maxilla and 57% patients with either a normal or prognathic mandible had a deficiency in the maxilla. Protraction facemask therapy has been successful in the early treatment of Class III patients with maxillary deficiency. However 25 to 33% of the treated patients reverted to an anterior crossbite when they underwent their pubertal growth spurt. Success in early Class III treatment depends on accurate diagnosis of the underlying skeletal and dentoalveolar components. This case report describes management of 11-year-old pubertal male patient, with mild skeletal Class III malocclusion due to retrognathic maxilla, treated with facemask therapy followed by lower incisor extraction.

CASE REPORT

Eleven year old male presented with skeletal Class III malocclusion. Clinical examination revealed an anterior crossbite with Class III molar, Class I canine relationship with mild malar deficiency and everted lower lip (Figs 1A to J). The cephalometric analysis revealed a retrognathic maxilla with compensated maxillary anterior teeth proclination and orthognathic mandible with proclined mandibular anterior teeth Table 1.

PROBLEM LIST

• Skeletal: Deficient maxilla.
• Soft tissues: Mild concave profile with malar deficiency, everted lower lip.
• Dental: Negative overjet, Anterior crossbite, mild lower anterior crowding and proclination.

TREATMENT PLAN

Phase I orthopedic phase: Bonded RME for 2 weeks to loosen the circum maxillary sutures (Figs 2A and B). Followed by Petit protraction facemask. Positive overjet was achieved after 5 months of facemask treatment.

Phase II treatment: Fixed mechanotherapy started in lower arch alone with extraction of 42 to relieve mild lower anterior crowding and proclination. No fixed treatment done in upper arch as alignment was good in upper arch (Figs 2C and D).
Figs 1A to J: (A) Pretreatment frontal view, (B) pretreatment oblique view, (C) pretreatment right lateral view, (D) pretreatment right buccal view, (E) pretreatment frontal view, (F) pretreatment left buccal view, (G) pretreatment overjet, over bite relation, (H) pretreatment cephalogram, (I) pretreatment OPG and (J) pretreatment occlusal X-ray

Figs 2A to E: (A) Bonded RME in place, (B) postexpansion occlusal X-ray, (C) postexpansion maxillary occlusal view, (D) mandibular occlusal view (before lower right lateral incisor extraction) and (E) 0.014" HANT archwire in lower arch (after lower right lateral incisor extraction)
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Treatment progress: 0.022” slot MBT prescription brackets were bonded in lower arch and first molars were banded. Leveling and alignment were started in lower arch with 0.014” HANT NiTi followed by 0.019 × 0.025” HANT NiTi and 0.019 × 0.025” stainless steel wires (Fig. 2E). Remaining space closure was done with active tie backs on 0.019 × 0.025” stainless steel wire followed by settling with 0.016” super elastic NiTi after changing the bracket position where ever required. Treatment progress: 0.022” slot MBT prescription brackets were bonded in lower arch and first molars were banded. Leveling and alignment were started in lower arch with 0.014” HANT NiTi followed by 0.019 × 0.025” HANT NiTi and 0.019 × 0.025” stainless steel wires (Fig. 2E). Remaining space closure was done with active tie backs on 0.019 × 0.025” stainless steel wire followed by settling with 0.016” super elastic NiTi after changing the bracket position where ever required.

At the end of the treatment Lower midline is compromised. The case was debonded with complete records (Figs 3A to K, Table 1). Postretention records were taken after 2 years of debonding.

DISCUSSION
In the presented case, mild facial concavity and malar deficiency were improved with Petit facemask therapy.
Mild lower arch crowding could be relieved with proximal stripping also. But as the patient had mild crowding, mild lower anterior proclination, reverse overjet and everted lower lip, hence it was decided to remove lower right lateral incisor to address all the problems in the lower arch. Lower right lateral incisor extraction was decided as it was in the zone of crowding and to avoid black triangle which are comparatively more with lower central incisor extraction. Extraction of mandibular incisor always remains a controversial modality in orthodontics. Mild to moderate Class III malocclusions with anterior crossbite or edge to edge relation of the incisors with minimal overbite or tendency toward open bite is one of the indication for mandibular incisor extraction. The resultant decrease of mandibular arch, with extraction of mandibular incisor and retraction of the remaining incisors is beneficial in patients with a mild Class III and reduced overbite.

CONCLUSION

Success in early Class III treatment depends on accurate diagnosis of the underlying skeletal and dentoalveolar components. Extraction of mandibular single incisor can be considered as a compromise treatment in mild to moderate skeletal Class III malocclusions to achieve positive overjet and overbite which in turn reduces relapse which are high in cases of Class III malocclusions with anterior edge to edge bite.

REFERENCES

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