Case Report

Nonsurgical Orthodontic Management of an Adult UCLP Patient with Canted Smile and Scissors Bite: A Case Report

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ABSTRACT

Orofacial clefts are the most common craniofacial birth defects with the necessity of orthodontic treatment so as to improve aesthetics, function and growth. This case report presents the successful orthodontic management of an adult female with operated unilateral cleft lip and palate with severely canted smile and vertical growth pattern categorized as Goslon 4. The main feature of the case is correction of canted smile without orthognathic surgery.

Key words: UCLP, Canted smile, Nonsurgical, Scissors bite, cleft

INTRODUCTION

Cleft of lip and palate diverge considerably by ethnic, racial and socioeconomic disparity documenting an incidence of 1 in 500 births in Asians.[1]

Majority of UCLP patients illustrate soft tissues paucity, deficient bone support, malformation, insufficient maxillary growth and abnormalities in dentition with higher frequency on the cleft side.[2]

Therefore the orthodontic treatment plan for such patients has to be build up encompassing the anatomic, functional, and developmental requisite of the patient.

The present case report describes the non surgical orthodontic management of a 21-year-old UCLP patient multifaceted with the canted smile due to mandibular incisor canting, complete crossbite, scissors bite of second molars and vertical growth pattern further intricating the impediment.

CASE REPORT

A 21 year female patient with operated UCLP reported in the orthodontic clinic with the chief complaints of crooked teeth, unesthetic canted smile, difficulty in chewing food and low self-esteem. Patient revealed a negative family history. Lip repair was performed at 2 years and palatoplasty at 3 years 8 months of age followed by lip revision at 8 years.

Patient had an asymmetric leptoprosopic, deviated chin towards left side, a relatively straight profile, scar tissue of the repaired lip, deformed alar dome and canted smile.Collapsed asymmetrical maxillary arch with complete crossbite was present except in second molars, which displayed scissors bite **(Table 1)**. Molar relation was end-on on right side and class II on left side.

The patient displayed an openbite tendency with negative overjet of –1 mm and classified as Goslon 4. In maxillary arch left lateral incisor was congenitally missing along with malformed left central incisor and palatally placed right lateral incisor and left canine **(Figure 1)**. Slight hypernasality was present though speech articulation and resonance were normal.

Radiographic findings revealed that there was an alveolar bony defect in maxilla with vertical growth tendency and chin deviation towards left side **(Table 2)**.

On photographic analysis significant mandibular incisor plane canting amounting to 12 degrees was evident when measured in reference to the interpupillary line **(Figure 1)**.

Table 1
Pre- and post-treatment maxillary arch width measurement

Parameter (mm)	*Pre-treatment*	*Post-treatment*
Maxillary inter canine width	13 mm	22 mm
Maxillary inter molar width	42 mm	44 cm

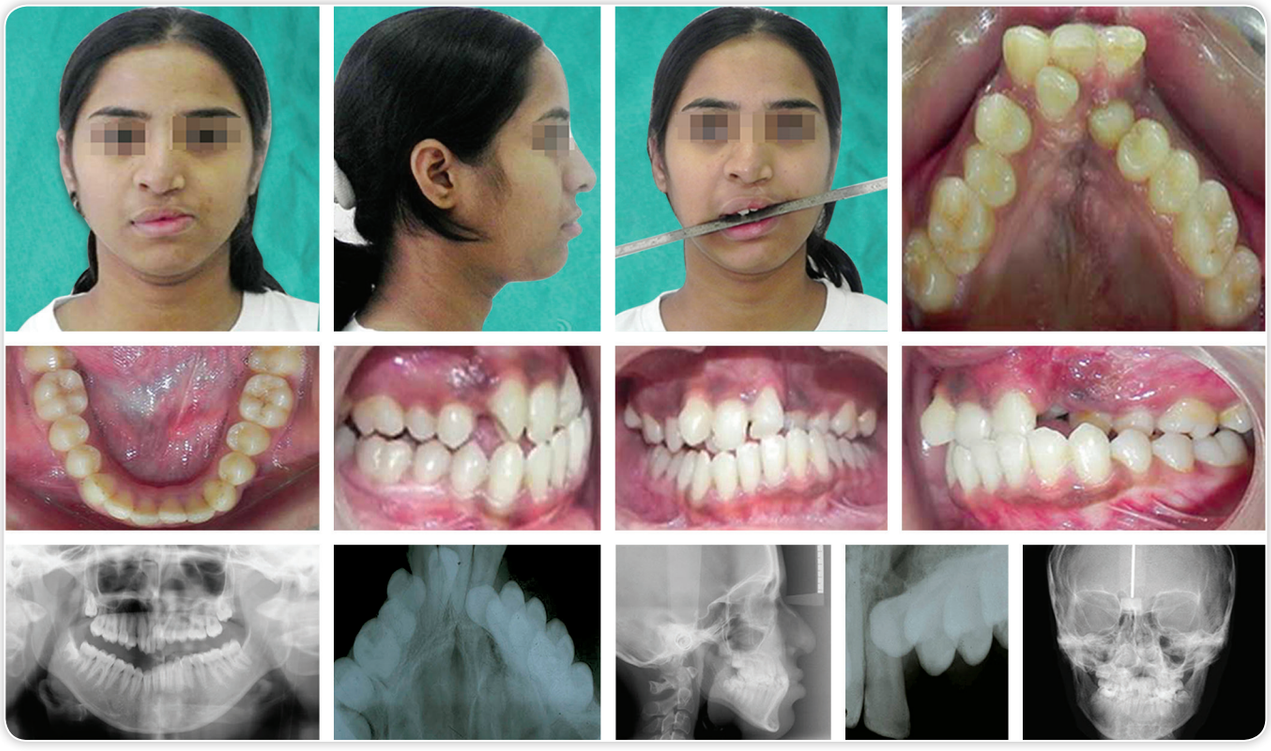

Figure 1 Pretreatment photographs and radiographs.

Table 2
Pre- and post-treatment cephalometric analysis

Parameter	*Pre-treatment*	*Post-treatment*
SNA (°)	72.7	72.7
SNB (°)	72.8	71.1
ANB (°)	–0.1	1.6
Wits (mm)	–1.5	–0.4
IMPA (°)	88.9	85.8
U1-SN (°)	90.9	102.8
FMA (°)	36.4	38.6
SN-GoGn (°)	44.4	46.7
Occlusal Plane Tilt (°)	6	4
A-Me-MSR (°)	2.3	1.6

Treatment Objectives

- To expand maxillary arch and correct complete crossbite
- To correct canting of mandibular incisors and hence improve smile
- To correct scissor bite in second molar region
- To align maxillary anterior region and achieve functional occlusion

Treatment Approach

Though the ideal treatment for such patient was ortho-surgical management due to skeletal asymmetry and severe vertical growth pattern, the patient was reluctant to undergo orthognathic surgery. Therefore, orthodontic treatment plan was charted. The maxillary arch was expanded with quadhelix and positive buccal overjet was achieved in 6 months. Initial alignment was done with 0.014 and 0.016 inch NiTi wire in maxillary and mandibular arch respectively using 0.022″ × 0.028″ slot standard edgewise appliance.

The main challenge in treating this case was correction of severe mandibular incisor canting.[3] This was corrected by incorporating sequentially accentuated long second order bends in 0.016 inch stainless steel (S.S.) wire for 2 months **(Figure 2)**.

Palatally placed maxillary right lateral incisor was extracted and space created for left maxillary canine. A piggy back 0.014 NiTi wire was ligated in palatally placed left maxillary canine over a base wire of 0.019 × 0.025 inch S.S. for alignment along with a mandibular posterior bite plate.

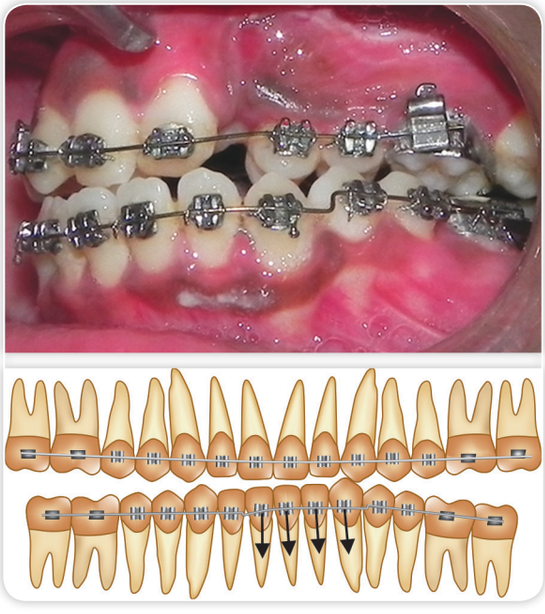

Figure 2 Mechanics for correction of canted smile

The scissor bite was corrected by 3/16 inch 2 ounces light cross elastics from buccal of maxillary second molar and lingual button on mandibular second molar along with posterior bite plane for 3 months followed by 0.019 × 0.025 inch S.S.in maxillary arch with buccal root torque in the posterior segment.

To achieve positive overjet and to correct dental midline, lower right first premolar was extracted and mandibular right canine retraction done with NiTi closed coil spring (150 gm, 9 mm) in 0.019 × 0.028 inch S.S wire followed by incisor retraction with bull loops in 0.019 × 0.025 inch TMA wire. Finally, composite build-up was done for maxillary central incisors and maxillary canines were reshaped so as to impersonate them for lateral incisors. For retention of maxillary arch expansion a modified rigid fixed retainer was cemented in maxillary arch along with bonding of maxillary and mandibular fixed spiral retainer **(Figures 3 and 4)**.

DISCUSSION

The simultaneous correction of crossbite and scissors bite was challenging in this case. A careful sequence for the expansion of maxillary arch via quadhelix till first molar to correct buccal crossbite followed by scissor bite correction in second molar region was planned. Several treatment procedures have been proposed to treat scissors-bite in the molar region.[4] In the present case light intermaxillary cross-elastics along with posterior bite plate to provide clearance for crossover tooth movement and to minimize extrusion side effects was used to correct the scissors bite.

The severely canted smile due to asymmetric deep bite as a result of supraeruption of lower incisors into the cleft space. This problem was dealt by intrusion of extruded teeth via conventional orthodontic appliances, which therefore avoided a more aggressive surgical approach. Differential second order bends accentuated sequentially along with posterior bite plate were used enabling a controlled biomechanics for intrusion of mandibular incisors apart from being simple, efficient, convenient and time conserving solution of such a difficult orthodontic problem. Alternatively the skeletal anchorage system can also be used to correct the incisal plane cant.[5] The incisal plane cant was reduced from 12° to 5° which is within proposed acceptable limit of 2° to 5° of incisal plane canting.[6-8]

In this case the maxillary left lateral incisor was missing and the cuspids of both sides were moved in position of lateral incisor. Reshaping of canines to simulate lateral incisors was done and the premolars were moved to the cuspid position.[9] Extraction of right second premolar was done to bring class I functional occlusion, to correct dental midline and to achieve

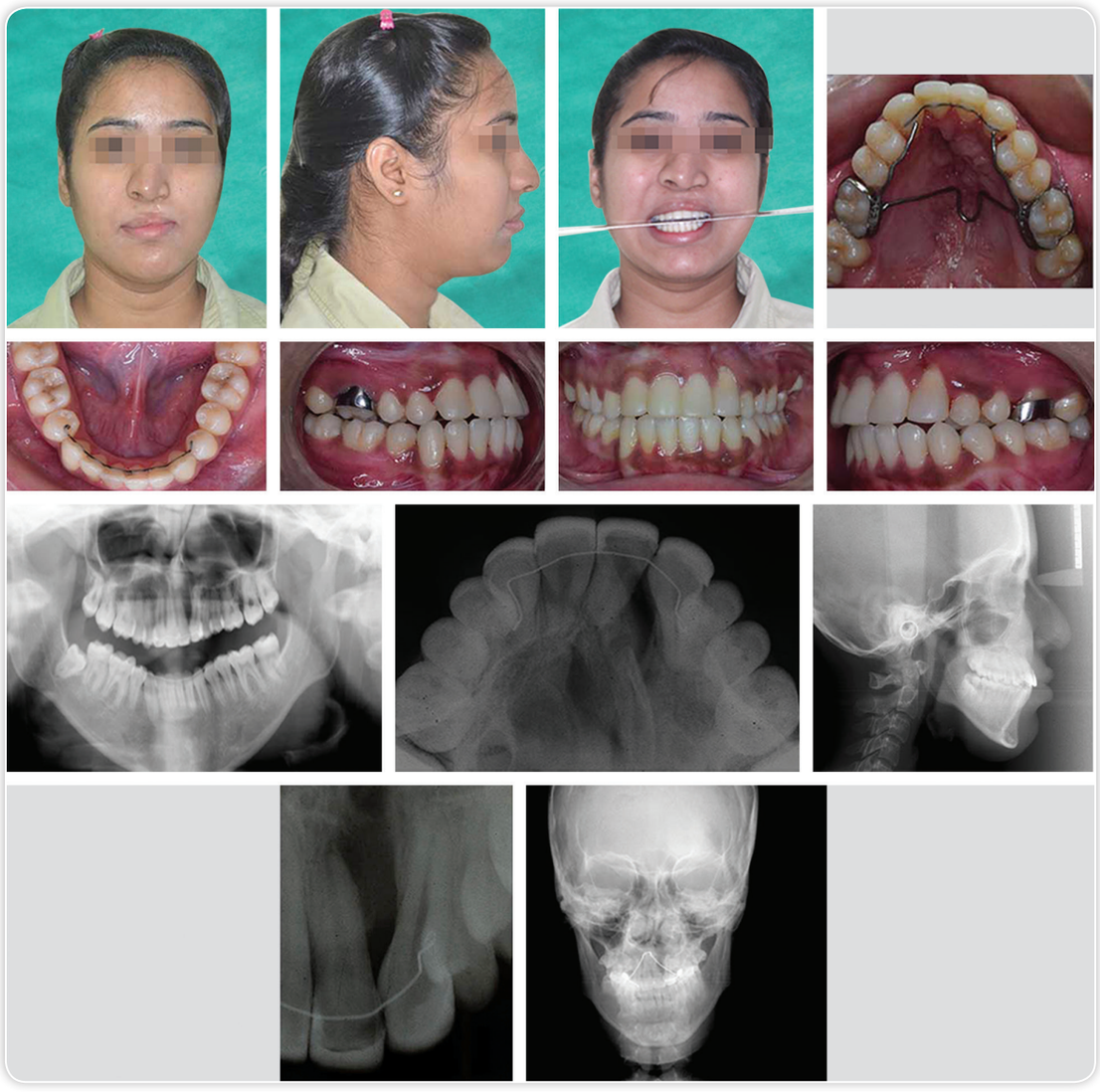

Figure 3 Post treatment photographs and radiographs

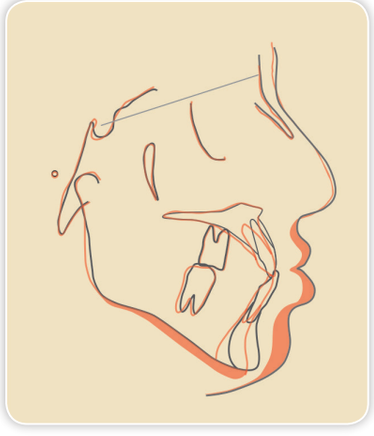

Figure 4 Pre and Post treatment radiograph superimposed on SN plane and registered at S.

positive overjet. Extraction of right lateral incisor was done since it was palatally placed and to correct dental midline which was shifted to the left side.

Although in this case there was a need for late secondary bone grafting procedure[10] and nose and lip revision, the patient was reluctant to undergo both the surgeries.

To maintain the results achieved by maxillary expansion, dental correction and to maintain intercanine width, a modified rigid fixed retainer was banded on the maxillary first molars and fixed spiral retainer was bonded on mandibular anteriors to provide permanent retention.

CONCLUSION

The present case report depicts successful nonsurgical orthodontic management of a case with UCLP of left side cat-

egorized as Goslon 4 of severity with canted smile, complete crossbite with scissors' bite of second molars and vertical growth pattern.

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