Orthodontic and Aesthetic Treatment Integration for Enhancing Facial Profile - A Case Report

Dr. Kalyani Sharma, [1] Dr. Sonali Mahadevia, [2] Dr. Bhavya Trivedi, [3] Dr. Keyur Soni, [4] Dr. Priyanka Shah, [5] Dr. Avni Solanki [6]

1. **Dr. Kalyani Sharma**
   PG Student, Orthodontics and Dentofacial Orthopaedics, Ahmedabad Dental College and Hospital, Near Hare Krishna Mandir, Bhadaj Ranchodpura Road, Ahmedabad, Gujarat - 382115
2. **Dr. Sonali Mahadevia**
   Professor and Head of Department, Orthodontics and Dentofacial Orthopaedics, Ahmedabad Dental College and Hospital, Near Hare Krishna Mandir, Bhadaj Ranchodpura Road, Ahmedabad, Gujarat - 382115
3. **Dr. Bhavya Trivedi**
   Professor, Orthodontics and Dentofacial Orthopaedics, Ahmedabad Dental College and Hospital, Near Hare Krishna Mandir, Bhadaj Ranchodpura Road, Ahmedabad, Gujarat - 382115
4. **Dr. Keyur Soni**
   Professor, Orthodontics and Dentofacial Orthopaedics, Ahmedabad Dental College and Hospital, Near Hare Krishna Mandir, Bhadaj Ranchodpura Road, Ahmedabad, Gujarat – 382115
5. **Dr. Priyanka Shah**
   Professor, Orthodontics and Dentofacial Orthopaedics, Ahmedabad Dental College and Hospital, Near Hare Krishna Mandir, Bhadaj Ranchodpura Road, Ahmedabad Gujarat – 382115
6. **Dr. Avni Solanki**
   Professor, Orthodontics and Dentofacial Orthopaedics, Ahmedabad Dental College and Hospital, Near Hare Krishna Mandir, Bhadaj Ranchodpura Road, Ahmedabad Gujarat – 382115

CORRESPONDING AUTHOR

Dr. Kalyani Sharma

PG Student, Orthodontics and Dentofacial Orthopaedics, Ahmedabad Dental College and Hospital,
Near Hare Krishna Mandir, Bhadaj Ranchodpura Road,
Ahmedabad, Gujarat - 382115
Mobile - +91-8238476082
Email - kalyanisharma290599@gmail.com

Abstract This case report discusses the orthodontic and aesthetic treatment of a 35-year-old female patient with forwardly placed upper front teeth, a prominent overjet, and chin fat. The patient's concerns included the appearance of her upper front teeth and submental fullness, affecting her facial profile. Orthodontic treatment was planned to correct the Class II malocclusion, reduce the overjet and overbite, and align the teeth using the MBT appliance. After initial leveling and alignment, space closure was achieved, and the patient's functional goals were met.

Additionally, non-surgical chin fat removal via deoxycholic acid injections was performed to address the patient's aesthetic concerns. The case demonstrates the effectiveness of combining orthodontics and cosmetic procedures to enhance both functional and aesthetic outcomes. The patient was satisfied with the results, highlighting the importance of a comprehensive approach to treating malocclusions and esthetic issues. However, the case also underscores the need for thorough treatment planning to ensure long-term success.

Keywords: Orthodontic treatment, Aesthetic enhancement, Class II malocclusion, Deoxycholic acid injections, Facial profile improvement

INTRODUCTION

Orthodontic treatment has long been recognized for its ability to correct dental and skeletal malocclusions, but in recent years, the focus has expanded to encompass not only functional improvements but also the enhancement of facial aesthetics. The interaction between dental alignment, skeletal structure, and soft tissue contours plays a significant role in achieving a harmonious facial appearance. This interdisciplinary approach—has proven to be invaluable in cases where patients present with both dental concerns and esthetic desires[1-2].

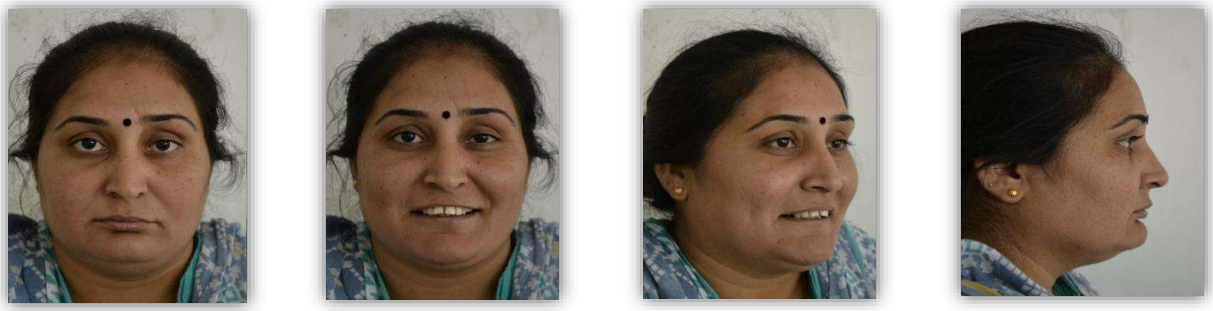
This case report focuses on the orthodontic and esthetic treatment of a 35-year-old female patient who sought intervention for her forwardly placed upper front teeth and a noticeable chin fat. Her primary concern was the appearance of her upper front teeth, which were protruding, contributing to a prominent overjet and overbite. Additionally, the patient expressed dissatisfaction with the aesthetic appearance of her lower chin area, further exacerbating her overall facial appearance achieve a more defined jawline and balanced lower facial aesthetics. She sought a comprehensive approach that would not only correct her dental misalignment but also enhance the overall harmony of her facial features[3-4].

CASE REPORT

Section I: Pre-Treatment Assessment

History and Clinical Assessment

A 35 year 4 months old female came with a chief complaint of forwardly placed upper front teeth region. No significant medical and dental history were present.



FRONTAL | FRONTAL SMILE | OBLIQUE | PROFILE

Fig. 1: Pre-treatment extra oral photographs

Extra-oral examination (Figure 1) revealed mesocephalic shape of the head, mesoprosopic facial pattern, with straight profile and competent lips, acute nasolabial angle and deep mentolabial sulcus. Short upper lip is present. Functional analysis showed a normal temporo- mandibular joint.

INTRAORAL FRONT

RIGHT SIDE

LEFT SIDE

MAXILLARY OCCLUSAL

MANDIBULAR OCCLUSAL

Fig. 2: Pre-treatment intra oral photographs

Intra-oral examination (Figure 2) showed permanent dentition with End-on molar relation on left and right side; and End-on canine relation on right and left side; and incisor relation of Class II div I with overjet of 12 mm and overbite of 6 mm was seen. Upper and lower midline were coinciding. Spacing was present in upper anterior region and crowding was present in lower anterior region.

General Radiographic Examination

Pre-treatment panoramic radiograph (Figure 3) & lateral cephalogram (Figure 4) were recorded and various analysis were done. Panoramic radiograph revealed symmetric dental development on both the sides. All the permanent teeth and developing tooth germs of all the third molars were present. The alveolar bone levels and root morphologies of the teeth were normal. Temporomandibular joint space appeared optimal with normal size, shape, and position of condyle heads.

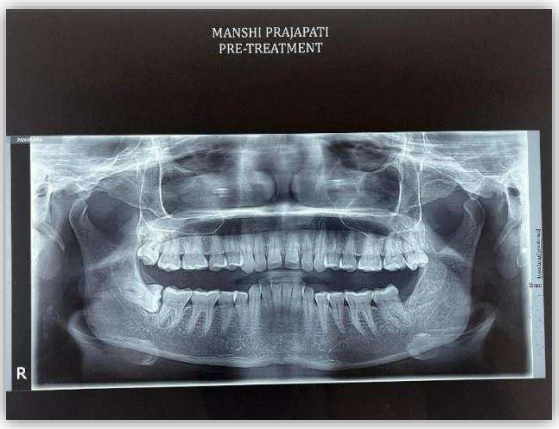


Fig. 3: Pre-treatment panoramic radiograph

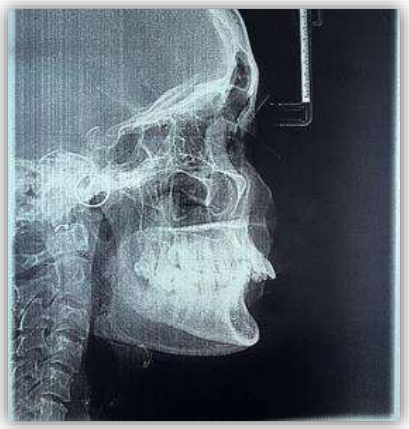


Fig. 4: Pre-treatment lateral cephalogram

Cephalometric analysis (table 1) shows Class I skeletal pattern, with straight profile, proclined upper incisors and Retroclined lower incisors, horizontal growth pattern; increased overjet and overbite. CVMI stages showed completion of growth.

Diagnosis and Etiology

A 35-year-old female patient presented with Class I skeletal jaw bases with End-on molar relation on right and left side with end on canine relation on Right and left side along with Class II div I incisor relation with a horizontal growth pattern, upper incisor proclination and lower incisor retroclination, increased overjet and overbite, spacing in upper arch and crowding in lower arch, straight profile. Additionally, clinical evaluation revealed excess submental fat contributing to a bulky chin appearance, affecting her lower facial aesthetics. Given her concerns, a diagnosis of submental fullness was made, and treatment options for chin fat removal were considered to enhance jawline definition and overall facial harmony.

Treatment Objective

1. To achieve Angle's Class I molar relation on the right & left side.
2. To achieve Class I canine relations on right & left side.
3. To achieve Ideal Overjet and Overbite
4. To achieve Ideal Inclinations of U/L anterior teeth.
5. To resolve crowding of teeth.
6. To correct rotations of individual teeth.
7. To reduce submental fat to enhance chin and jawline definition.

Treatment Plan

The treatment plan for the patient was correction of proclination of upper anteriors, retroclination of lower anteriors and correction of end-on molar and canine relation. Initial leveling and aligning of the teeth were done with 0.022 MBT appliance (3M unitek gemini metal brackets). Alignment was done from 0.012, 0.014, 0.016, 0.016*0.022 Niti, 0.017*0.025 Niti, 0.019*0.025 Niti upto 0.019*0.025 SS wire. Once the aligning was done and 0.019*0.025 SS wire was reached genioplasty was planned for the chin fat removal and deep bite correction. Finishing and detailing was done later on.

Section I: Leveling and Aligning

The bonding of all teeth were done with 3M unitek gemini metal brackets and 1st molars and 2nd molars of upper arch were banded. The wire sequence was progressed according to the MBT from 0.012, 0.014, 0.016, 0.016*0.022 Niti, 0.017*0.025 Niti, 0.019*0.025 Niti upto 0.019*0.025 SS stage.

Section II: Space Closure

After the initial levelling and alignment, space closure was achieved by elastomeric chain (GNH, short).

Section III: Finishing and detailing

Finishing and detailing was done followed by settling elastics which were placed for the correction of molar relation.

Section IV: Post treatment stage

Before finishing and detailing and proper interdigitation, the patient bracket were debonded. Patient was satisfied with result and was willing to remove braces. So, final finishing & detailing stage was not done.

FRONTAL

FRONT SMILE

OBLIQUE

PROFILE

Section V: Non-surgical soft tissue esthetic procedures

After completion of orthodontic treatment, patient went for chin fat removal (figure 8). Firstly in the procedure an ink 'tattoo grid' is applied to the area to be treated to guide the delivery of injections; this is removed with an alcohol-soaked swab following treatment.

INTRAORAL FRONT

MAXILLARY OCCLUSAL

MANDIBULAR OCCLUSAL

Fig. 5: Post-treatment photographs

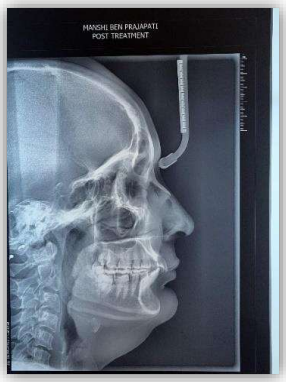


Fig. 6: Post-treatment lateral cephalogram

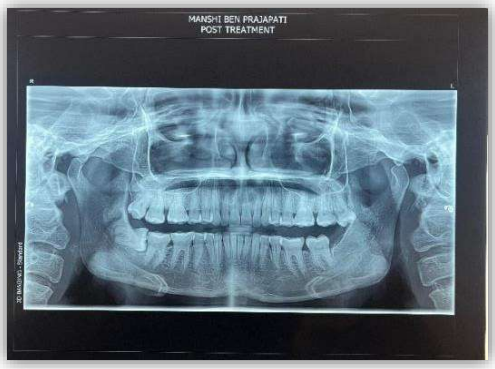


Fig. 7: Post-treatment panoramic cephalogram

Deoxycholic acid is injected subcutaneously as 0.2 mL doses, 1 cm apart, into the submental fat treatment area. The concentration used is 10 mg/mL (2 mg/cm^2). A 30 gauge (or smaller) 0.5-inch long needle is used. Up to 50 individual injections may be injected per treatment session, equivalent to a maximum of 10 mL of deoxycholic acid[5].

Post-treatment bruising and pain was alleviated by compression dressings, cold packs and oral analgesia. Treatment was repeated at 4–8-week intervals for 3 treatments[6-7].

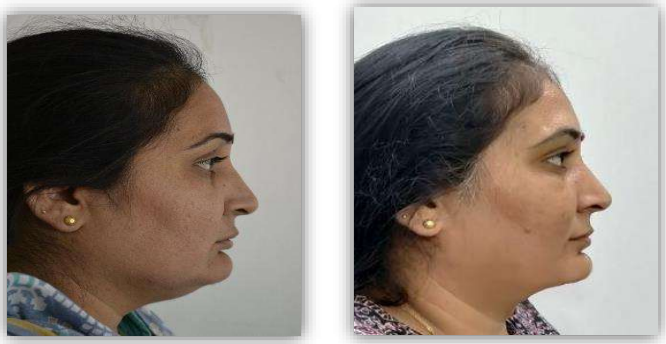


Fig. 8: Pre-treatment & Post-treatment photographs

DISCUSSION

Orthodontic treatment in this case focused on correcting the Class II malocclusion, which involved reducing the overjet and overbite. The alignment was achieved through a series of wire changes based on the MBT system. This careful progression ensured effective alignment and leveling of the teeth[2].

The treatment achieved correction of the upper and lower incisor inclinations addressed both functional and esthetic concerns. Achieving these goals not only improves the patient's bite but also plays a significant role in enhancing the smile and facial harmony. It is important to note that the patient opted to have the braces removed before completing the final detailing and finishing stage. The patient was satisfied with the results, it serves as a reminder of the importance of completing the entire treatment sequence to ensure long-term functional and aesthetic outcomes[3].

A major aspect of this case is the integration of non-surgical aesthetic procedures to enhance facial appearance. After the orthodontic treatment, the patient sought chin fat removal through deoxycholic acid injections. This technique has gained popularity due to its minimally invasive nature and effectiveness in contouring the chin and neck areas, addressing concerns such as submental fullness and nasolabial folds. The decision to perform soft tissue enhancement following orthodontic treatment was driven by the patient's dissatisfaction with her chin profile and the prominence of the nasolabial folds. The use of deoxycholic acid injections was a suitable option, as it effectively reduces submental fat, enhancing the patient's profile without the need for surgical intervention. The procedure's results were gradual, with multiple treatment sessions required to achieve optimal outcomes[7].

CONCLUSION

This case demonstrates the importance of a holistic approach to treating patients with both dental malocclusions and aesthetic concerns. The combination of orthodontic treatment and non-surgical cosmetic procedures enabled the achievement of both functional and aesthetic improvements, enhancing the patient's smile and facial profile. However, this case also emphasizes the need for careful treatment planning, particularly in ensuring that both the orthodontic and aesthetic components are completed to the fullest extent.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given her consent for her images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of Interest

None.

Source of Funding

None.

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