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Class I malocclusion with crowding and deep bite managed without extraction

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Abstract

Class I malocclusion with crowding is the most common type of malocclusion that can be seen in everyday clinical practice.[1] Dental crowding does not only cause aesthetic impairment but also poses a challenge in maintaining oral hygiene as it is tougher to clean between teeth that are crowded.[2] Crowding indirectly acts as a confounding factor in periodontal diseases such as gingivitis which may lead to tooth mobility and even loss in severe cases.[3] Dental crowding also causes a psychological barrier for people from speaking and smiling openly. This also makes people to be underconfident and lose out on opportunities in personal and professional lives.[4,5] This is a case of management of class I malocclusion with crowding and deep bite without dental extraction or inter proximal reduction (IPR).

Case Report:

A 16-year-old patient had come to the department of Orthodontics and Dentofacial orthopaedics in Subbaiah Institute of Dental Sciences, Shivamogga with a chief complaint of irregularly placed upper and lower front teeth and one forwardly placed upper front tooth. Patient gave past dental history of a filling in his upper left back region one year ago and no significant medical history. Patient was internally motivated with a positive attitude towards orthodontic treatment; he cited aesthetics as the main reason for him taking orthodontic treatment.

Extraoral examination showed that the patient had a mesocephalic head, mesoprosopic facial form with potentially competent lips with no gross facial asymmetry. He had a convex profile with normal mentolabial sulcus. He had no abnormalities irt speech, respiration, deglutition or TMJ function. He also gave no history of any habits.

Fig 1: Pre-treatment Extra oral images

Intraoral examination showed that the patient had good oral hygiene, normal gingiva, mucosal frenal attachment irt maxillary and mandibular labial frenum and no abnormalities in the size and movements of the tongue. There was mild crowding in maxillary arch and moderate crowding in the mandibular arch; with an overjet of 5 mm and overbite of 4 mm with no midline shift to be noted. There was Class 1 molar and canine relationship bilaterally. Model analysis showed a discrepancy of -2 mm in the maxillary arch and -5 mm in the mandibular arch.

Fig 2: Pre-treatment Intra oral photographs

The OPG of the patient showed all third molars were present and were still in root formation stage. The lateral cephalogram showed he was in CVMI stage 4 and the cephalometric analysis revealed that the patient had an SNA of 82°, SNB of 78°, ANB of 4° Go-Gn to SN was 35°, IMPA of 92° giving an inference of Skeletal class I base with orthognathic maxilla and mandible with average inclination of maxillary and mandibular incisors and a reduced LAFH of 53 mm and an average nasolabial angle of 108°. Soft tissue analysis showed protruded maxillary incisors with thin and unstrained upper lip with average soft tissue chin thickness.

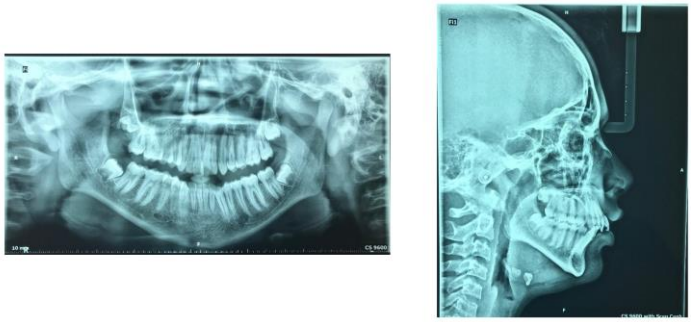

Fig 3: Pre-treatment OPG and Lateral cephalogram

Diagnosis:

Angle's Class I malocclusion with maxillary and mandibular anterior crowding with deep bite and potentially incompetent lips.

Prioritized problem list:

1. Maxillary and mandibular anterior crowding
2. Rotations irt multiple teeth
3. Maxillary and mandibular anterior proclination
4. Increased overbite
5. Potentially incompetent lips

Treatment objectives:

1. To correct maxillary and mandibular anterior crowding
2. To correct rotations
3. To correct maxillary and mandibular anterior proclination
4. To achieve ideal overbite
5. To achieve lip competency

Treatment plan:

Considering all the factors and information gathered using the clinical examination, photographs, radiographs and the study models and also keeping the buccal corridor space that available into consideration we chose to go ahead with non-extraction line of treatment using Selfy plus self-ligation bracket system 0.022" slot followed by fixed lingual retainer.

Treatment progress:

Bonding of brackets and buccal tubes was done irt maxillary and mandibular arches. First and second molars were bonded in all the quadrants. Leveling and alignment was done using 0.013" CuNiTi, 0.014 x 0.025" CuNiTi and 0.018 x 0.025" CuNiTi. After levelling and alignment was achieved 0.019 x 0.025" SS wire was placed for torque expression and stabilizing the corrections. Once all the objectives were

achieved and the patient was satisfied with the treatment the braces were debonded and lingual bonded retainer was placed in the maxillary and mandibular arches. The total treatment duration was 11 months.

Treatment progress:

An informed consent was obtained and case history of the patient was recorded. Oral prophylaxis was done before initiating orthodontic treatment. The treatment was continued by bonding 0.022" slot Selfy plus passive self-ligating appliance. All first and second molars were bonded using 0.022" slot buccal tubes. Initial levelling and aligning were done using 0.013", 0.014x0.025" and 0.018x0.025" CuNiTi wires in both the arches. Then 0.019x0.025" SS wire was placed and left in place passively for almost 4 months to stabilize the corrections. Once all the desired results were achieved the appliance was removed after 11 months of treatment. Fixed lingual retainer was placed from canine to canine in both the arches after debonding.

Discussion:

This case report discussed a case of a 16-year-old male patient with a chief complaint of irregularly placed upper and lower front teeth and wanted to get orthodontic treatment for aesthetics. After keeping intraoral and extraoral findings and also taking cephalometric and model analysis into consideration, non-extraction line of treatment was chosen. The patient had mild to moderate crowding in both the arches which was easily managed without needing any sort of extraction or inter proximal reduction (IPR). The maxillary and mandibular anterior crowding was relieved by arch development[6] and overbite reduced by bite opening caused due to bonding of second molars. Lip competency was also achieved due to reduction in the overjet. Once all the treatment objectives were achieved, the appliance was debonded and scaling and polishing was performed after removing the residual composite from the tooth surface. A fixed lingual retainer was bonded from canine to canine in both the arches. Post treatment cephalogram showed satisfactory results and the patient was also satisfied with the treatment outcome.

Fig 4: Post treatment extraoral images.

Fig 5: Post treatment intraoral images.

Fig 6: Post treatment lateral cephalogram

Conclusion:

This case was treated non-extraction using passive self-ligation appliance. All the treatment objectives were achieved successfully. In patients with Class I malocclusion with mild to moderate crowding with a narrow arch or good buccal corridor space availability it can be treated without extraction by the space obtained by arch development achieved using broader arch wires.

The choice of line of treatment, which appliance to be used and what wires to be used is based on sound clinical knowledge and proper diagnosis and treatment planning by utilizing all the records available at hand during it to achieve all the treatment objectives.

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