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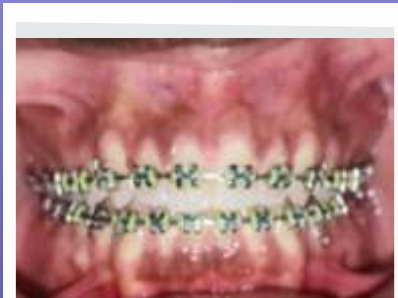
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Management of Severe Upper and Lower Spacing with Proclination Of The Upper Anterior Teeth - A Case Report

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Introduction

Spacing is a form of malocclusion wherein there is a gap between two or more teeth.¹ It can be localised or generalised. Midline diastema is any space seen between the adjacent central incisors that is greater than 0.5mm.^{3, 4} Spacing can be perceived as unaesthetic and can negatively affect people psychosocially, preventing them from smiling in the public and losing their self-confidence.⁵ Orthodontic treatment of spaces improves smile as well as boosts the confidence of patients who seek

orthodontic care for the correction of this malocclusion.^{5,6}

Clinical case

A 19-year-old presented at the Orthodontic clinic of the Lagos University Teaching Hospital with a complaint of “I don't like the spaces between my teeth and my upper teeth are too forward”. There was no contributory medical history.

Orthodontic examination showed no facial asymmetry, straight profile as seen in skeletal pattern 1 with incompetent lips (Jackson score of 2/0). Figure 1



Figure 1: Pre-treatment Extra Oral Photos

Intra-oral examination revealed that all permanent teeth were present, and there were no decayed, missing or filled teeth. Intraoral examination revealed Angle's class I molar relationship bilaterally, the overjet was 3.5mm while the overbite was reduced and incomplete.

There was severe upper anterior spacing of 11mm,

inclusive of midline diastema of 4mm, moderate lower anterior spacing of 5mm, mild lower posterior spacing of 2mm, increased upper incisal angle, and normal lower incisal angle.

Intraoral examination also showed rotation of teeth 12, 13, 22, 32 and 44, normal upper and lower arch widths and lower midline shift to the left by 0.5mm.



Figure 2: Pre-Treatment Intraoral Photos

Panoramic radiograph showed distomolars in the upper right, lower right and lower left quadrant with a mesio-angular impaction of the lower right distomolar. (Figure 3). The cephalometric analysis

showed increased upper and lower incisal angles of 127.5° and 105° respectively, increased Frankfort-mandibular plane angle and lower facial height of 30° and 57% respectively, with reduced inter-incisal angle.

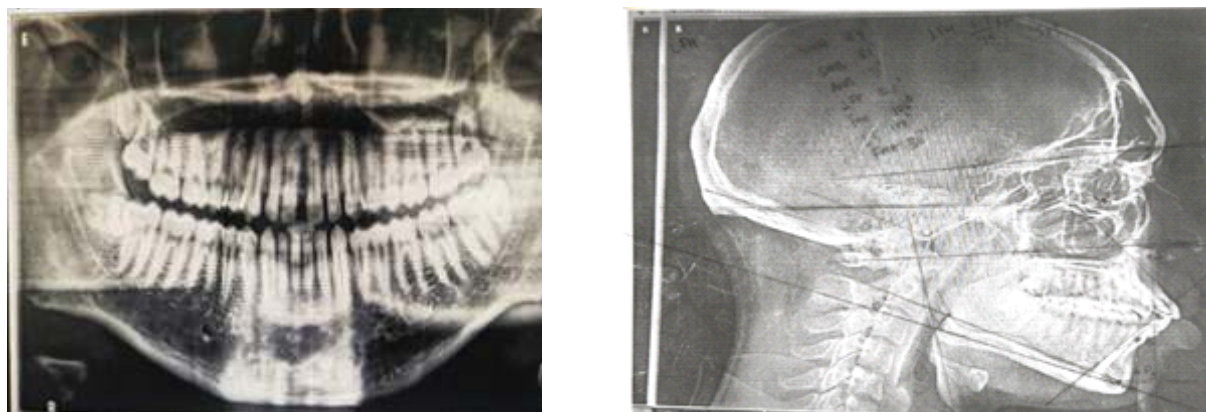


Figure 3: Pre-Treatment Panoramic and Cephalometric Radiographs



Figure 4: Pre-Treatment Study Models

Treatment Objectives

The treatment objectives were to achieve normal and complete overbite, close upper and lower spaces, derotate the rotated teeth, improve lip competence, and surgical extraction of the distomolars.

Treatment Plan

The treatment plan was Comprehensive fixed orthodontic therapy using pre-adjusted edgewise to consider the extraction of the disto-molars. Retention plan was fixed lingual retainers with Hawley's retainer and Vacuum formed thermoplastic retainers in upper and lower arches, respectively, at the end of treatment.

Treatment Progress

Complete upper and lower arch set-up was done using the Roth 0.022 prescription-pre-adjusted edgewise bracket system. Buccal tubes were bonded on 16,17,26,27,36,37,46,47. The arch wire sequence was 0.014, 0.016, 0.018, Nickel Titanium (NiTi) wires in the upper and lower arches. This was followed by 0.018, 0.020, and 0.019X0.025 Stainless steel wires (SSW) in the upper and lower arches. Space closure was done in stages; E-chain was run from 12-22, 13-17 bilaterally in the upper arch.

Simultaneously, space closure was also commenced in the lower arch from 32-42.

Following space closure in the upper and lower anterior segments, figure 8 wiring using soft stainless steel wire was used to keep the spaces in the upper and lower anterior segments closed. Crimpable hooks were placed on the upper 0.019X0.025 SSW for the application of active tie back (ATB) for continued space closure in the upper arch while E-chain was run from 37-47 in the lower arch for space closure. Figure of 8 wiring was applied from 37 – 47 to keep the spaces in the lower arch closed while ATB was continued in the upper arch. The residual spaces in the upper arch were closed using E-chain from 17-27.

Diagonal elastics were placed from 11 and 12 in the upper arch to 31 and 32 in the lower arch to correct the upper midline shift. While the midline correction was achieved, the upper right canine was tending towards class II, so right unilateral class II elastics was worn by the patient. The patient had Kobayashi on 14, 15, 44, 45 for box elastics for posterior settling and was debonded after 19 months. Fixed lingual retainer was bonded in the upper and lower arches, after which, upper and lower impressions were taken for Hawley's and Essix retainers respectively.



Figure 5: Intraoperative Photos



Figure 6: Post Treatment Extra-Oral Photos



Figure 7: Post Treatment Extraoral Photos



Figure 8: Pre-treatment And Post-treatment

Treatment Results

Normal overjet of 2mm, normal and complete overbite, upper and lower spaces closed, and bimaxillary proclination was reduced. The derotation of the rotated teeth, coincident midline, improved lip competence, and the smile and profile remained balanced.

Discussion

Spacing between the teeth is one of the commonest malocclusions seen in adults. This patient was

managed using the preadjusted edgewise bracket system with Roth 0.022 prescription without extraction, despite the presence of the bimaxillary proclination. This decision was made because the patient presented with severe spacing and the existing spaces were enough to correct the upper and lower proclination. In addition, the pretreatment cephalometric radiograph values also showed that the upper and lower teeth proclination were just slightly above the normal range, hence, the need for extraction was precluded. The treatment and closure

of the existing space improved the upper and lower incisal inclination, lip competence, and the patient's smile at the end of the treatment. The choice of retention with fixed upper and lingual retainers was important to prevent relapse following treatment.

Conclusion

This was a case of spacing in Class 1 malocclusion. An appropriate treatment plan was determined. The

treatment objectives were achieved and the treatment outcome was satisfactory. Spacing has a high relapse tendency, so fixed retainers were considered in the plan for retention.

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Conflict of Interest - None to declare

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