

INTRUSION OF OVERERUPTED UPPER FIRST MOLAR AND LOWER MOLAR PROTRACTION USING ORTHODONTIC MINISCREWS

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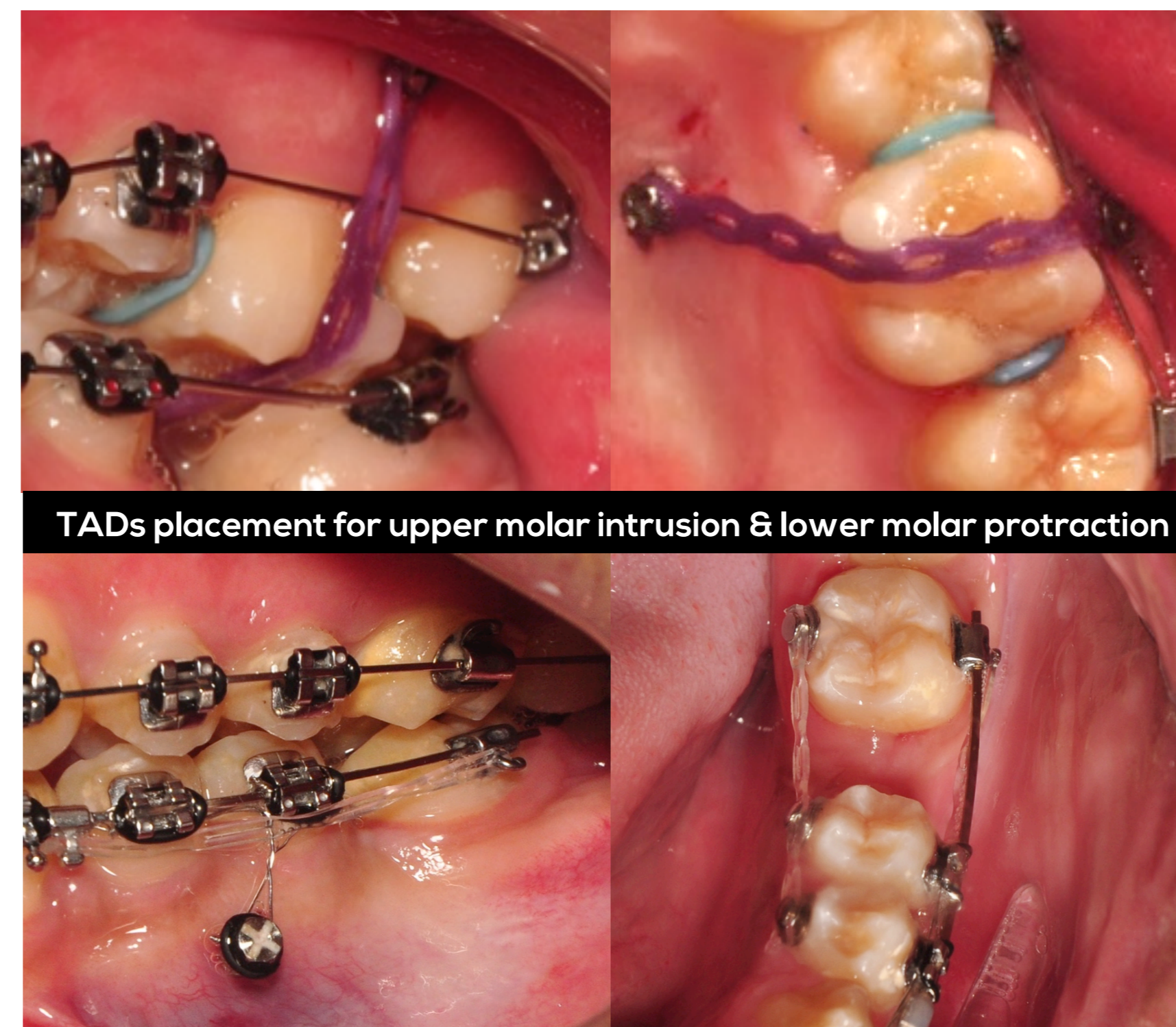
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INTRODUCTION

Early loss of the lower first molar due to caries leads to overerupted opposing upper first molar and tipping of the neighboring teeth, resulting in occlusal changes. The use of miniscrew as temporary anchorage devices (TADs) in orthodontic treatment may provide a minimally invasive approach to re-establish a functional posterior occlusion.

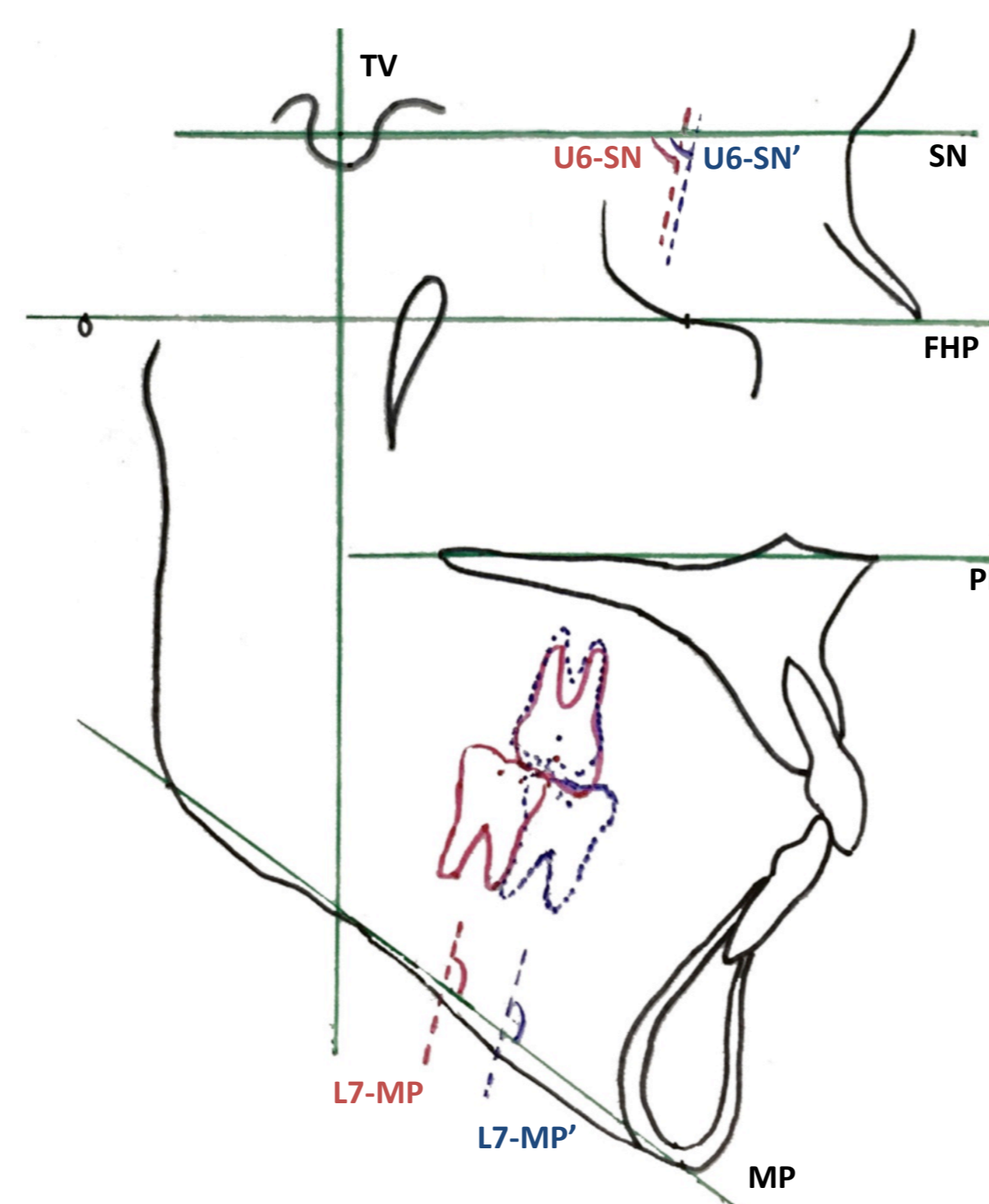
DIAGNOSIS

A 22-years-old male presented with a chief complaint of missing lower left molar and he refused to have prosthodontic rehabilitation of the edentulous space. Intraoral examination showed mild crowding on both arches, also extrusion of upper left first molar and mesial tipping of lower left second molar to edentulous space.



DISCUSSION

Upper left first molar intrusion was achieved with method as described by Kravitz et al (2007).¹ Elastic separator were placed prior to intrusion in order to prevent *door-wedge effect* while intruding the molar.² Molar protraction was done on .019 x .025 stainless steel archwire with double traction method as described by Jacobs et al (2011) and Brierley & Sandler (2016).^{3,4} Miniscrew served as indirect anchorage to minimize side effects resulting from molar protraction process. Cephalometric measurements show intruded and protracted molar in relatively upright position, while vertical dimension is maintained in the end of the treatment.



Pre and post treatment cephalometric tracing superimposition, marked by red and blue line respectively, to evaluate molar intrusion and protraction.^{5,6} Note the changes on U6 and L7 position.

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AIMS OF TREATMENT

The main objectives of the treatment were to intrude the overerupted molar and close the edentulous space by means of molar protraction utilizing orthodontic miniscrews.

TREATMENT PROGRESS

A pre-adjusted edgewise fixed appliance system with MBT prescription was used to treat this case. TADs location was selected based on favourable cortical bone density and treatment mechanics. Two orthodontic miniscrews were placed in buccal and palatal dentoalveolar of upper left posterior region, with elastic chain pass diagonally across occlusal table of overerupted molar. One miniscrew was then removed and placed in buccal dentoalveolar of lower left posterior region after achieving molar intrusion. It then provided an indirect anchorage for molar protraction. A total of ± 2.75 mm upper molar intrusion and ± 8 mm lower molar protraction were achieved resulting from 22 months of treatment.

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CONCLUSION

The use of miniscrew as TADs has allowed the orthodontist to perform difficult tooth movements, including molar intrusion and protraction, predictably and with less patient compliance.

Cephalometric measurements				
Measurement	Mean	SD	Pre-treatment	Post-treatment
Horizontal Skeletal				
SNA (°)	82	2	86	86
SNB (°)	80	2	82	82
ANB (°)	3	2	4	4
The Wits (mm)	1	2	2.5	2
Angle of convexity (°)	0	10	7.5	7
Vertical Skeletal				
FMPA (°)	28	4	33	33
MMPA (°)	27	4	32	32
LAFH (%)	55	2	58.57	58.72
Dental				
Interincisal angle (°)	135	10	128	127
U1-palatal plane (°)	109	6	108	109
L1-mandibular plane (°)	93	6	89	89
U6-PP difference (mm)	-	-	-	2.75
U6-TV difference (mm)	-	-	-	0.5 to mesial
U6-SN difference (°)	-	-	-	1 to distal
L7-TV difference (mm)	-	-	-	8 to mesial
L7-MP difference (°)	-	-	-	1.5 to mesial
Soft Tissue				
Upper lip - E Line (mm)	1	2	-1.5	-1.5
Lower lip - E Line (mm)	0	2	3	2.5