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Multidisciplinary Rehabilitation Of Mutilated Malocclusion – A Case Report

Dr Jiwanasha Agrawal[1], Dr Snehal Jagtap[2], Dr Manish Suresh Agrawal3, Dr Pinki Kumari[4], Dr Rutvij Mangesh Mohile[5], Dr Sangmesh Fulari[6]*

[1*]Professor and Head of Department, Department of Orthodontics and Dentofacial orthopedics.Bharati Vidyapeeth(Deemed to be) University Pune, Dental college and Hospital, Sangli. Phone number: +91 84838 78008 E-mail address: drjiwanashaagrawal@gmail.com

[2]Assistant Professor Department of Orthodontics and Dentofacial Orthopedics Dr. D.Y.Patil Dental College and Hospital, Dr. D.Y.Patil Vidyapeeth, Pimpri, Pune, Maharashtra, India

[3]Professor, Department of Orthodontics and Dentofacial Orthopaedics. Bharati Vidyapeeth (deemed to be) University Pune, Dental College and Hospital, Sangli.

[4]Post Graduate student Department of Orthodontics and Dentofacial Orthopaedics. Bharati Vidyapeeth (deemed to be) University Pune, Dental College and Hospital, Sangli.

[5]Post Graduate student Department of Orthodontics and Dentofacial Orthopaedics. Bharati Vidyapeeth (deemed to be) University Pune, Dental College and Hospital, Sangli.

[6]Associate Professor, Department of Orthodontics and Dentofacial Orthopaedics. Bharati Vidyapeeth (deemed to be) University Pune, Dental College and Hospital, Sangli.

***Corresponding author: –** Dr Jiwanasha Agrawal

*Professor and Head of Department, Department of Orthodontics and Dentofacial Orthopedics. Bharati Vidyapeeth (Deemed to be) University Pune, Dental College and Hospital, Sangli. Phone number: +91 8483878008.

E-mail: drjiwanashaagrawal@gmail.com

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Abstract

Introduction: Multidisciplinary management of case presenting with compromised dentition is challenging to treat because of the absence of anchor teeth with extraction spaces, extruded posterior teeth etc. A problem focussed approach is often the preferred method to assist in the treatment process.

Description: Within this report, a case is examined that presents various orthodontic issues, notably a class II div1 malocclusion, deep bite, gummy smile, proclined maxillary incisors, missing 16,26,27,36,37,46,47; Extruded 17, mild crowding in mandibular anteriors, spacing in maxillary anterior teeth.

A modified version of the Dr. Toshniwal's Intrusion arch was employed in managing this case which involves second molar intrusion and InfraZygomaticCrest(IZC) Bone Screws for closure of extraction spaces and prosthetic replacement of edentulous spaces.

Results: The treatment lasted for total of 24 months and the results remained consistent during the 2 year follow up.

Conclusion: Accurate diagnosis and proper understanding of biomechanics are essential for successfully treating compromised dental condition.

Key words: Toshniwal's Intrusion Arch, Molar Intrusion, Infra-zygomatic crest (IZC) Bonescrews.

Introduction:

Today, twenty-five percent of orthodontic patient are adults. Recent advances in orthodontics have also made treatment more comfortable and less noticeable than ever for individuals of all age groups.

A multidisciplinary approach which involves orthodontics, periodontics and restorative treatment is essential to offer entire rehabilitation in terms of function and esthetics with a satisfactory and pleasant lengthy-time period analysis. When compared to adolescent, adults seeking orthodontic treatment can be excellent patient with high motivation and cooperation.

Nonetheless, this also means healthcare providers must take into account the unique needs of adult patients, who often suffer from periodontal diseases and may have multiple missing teeth.

Therefore, a well suited-treatment regimen must be devised to address the orthodontic issues without worsening the current condition. Bonescrews provide reliable support for biomechanical movements and need careful clinical and radiographic monitoring to ensure precise force control, promoting the maintenance of periodontal health and stability.

Chief Complaint:

A young woman, aged 24 visited the department of Orthodontics and Dentofacial Orthopedics stating her main concern of forwardly placed upper front teeth and difficulty in chewing.

Clinical Features:

Extra-orally the patient showed mesocephalic, mesomorphic facial type, with a symmetrical face. She had gummy smile, convex facial profile, average nasolabial angle, negative VTO, deep mentolabial sulcus and incompetent lips. (Figure 1.)

FIGURE 1: Pre treatment extra-oral photographs.

Intraorally the patient showed proclined maxillary incisors, missing 16,26,27,36,37,46,47; Extruded 17, mild crowding in mandibular anteriors, spacing in maxillary anterior teeth. (Figure 2.)

FIGURE 2: Pre treatment intra-oral photographs.

Lateral Cephalogram showed skeletal class II, proclined anterior teeth. Panoramic radiograph showed missing 16,26,27,36,37,46,47 and extrusion and mesial tipping of 17. (Figure 3.)

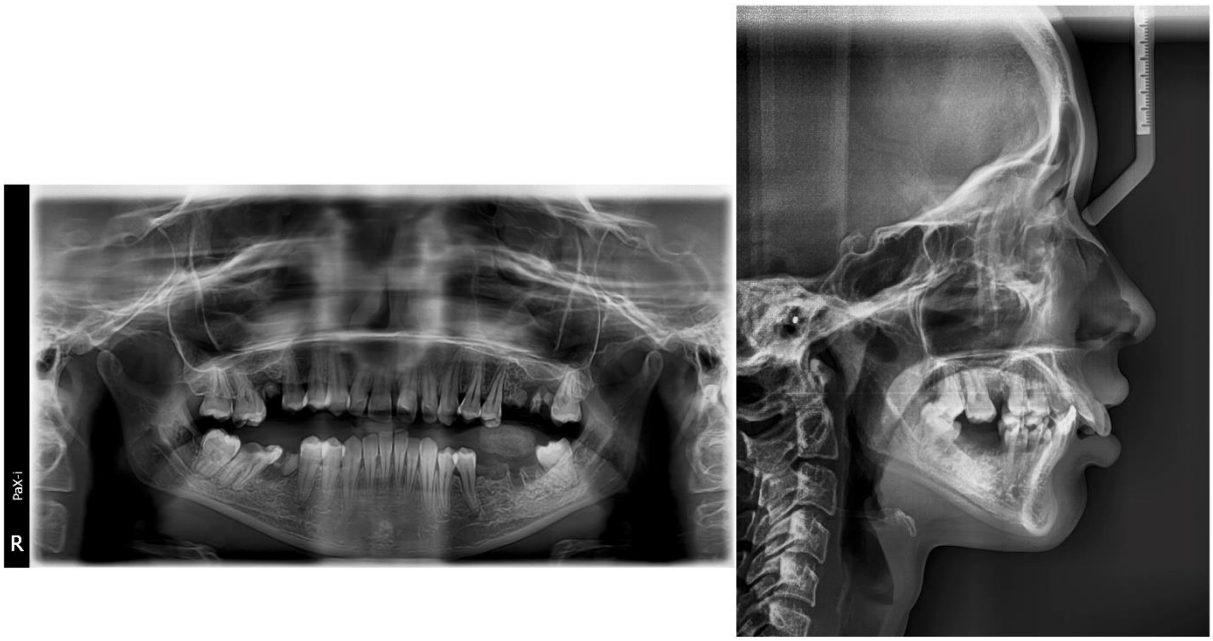

FIGURE 3: Pre treatment radiographs.

Diagnosis:

A 24 years old woman has been identified with skeletal class II malocclusion characterized by a retrusive mandible and vertical growth pattern, Gummy Smile, dental class II Division 1 relationship. There was spacing present in the upper front teeth, with mild crowding observed in lower front teeth, missing 16,26,27,36,37,46,47, extrusion and mesial tipping of 17, soft tissue profile showed convex profile with acute nasolabial angle, incompetent lips and retruded chin.

Treatment Objectives:

- Intrusion with 17
- Alignment and leveling in both arches
- Correction of severe proclination in upper arch
- Prosthesis for missing 16,26,27,36,37,46,47
- Achieving a pleasing profile

Treatment Plan:

Stage 1 –
Strap up with MBT 0.022 bracket
Intrusion of 17 using modified Dr. Toshniwal's Intrusion arch
Alignment and leveling till 19x25 SS wire
Extraction with 14

Stage 2 –
Placement of InfraZygomatic Crest Bone Screws (IZC) in upper arch in order to strengthen the anchorage for the intrusion and retraction of the anterior segment.
The retraction with sliding mechanics on both sides

Stage 3 –
Settling elastics to settle the occlusion in premolar region
Prosthetic replacement for missing 16,26,27,36,37,46,47
Retention with Beggs retainer

Treatment:

Treatment started with the bonding of MBT brackets (0.022 × 0.028″), progressing from a 0.014" NiTi to 0.019 × 0.025" SS wire for alignment (Figure 5). The appliance of choice for intrusion of upper right second molar (17) was a modification of Dr. Toshniwal's Intrusion arch[1] (Figure 4.). Light force was applied for 6 months for intrusion of 17 approximately upto 90gms to avoid root resorption.

FIGURE 4: Dr. Toshniwal's (NTRDC) intrusion arch

After significant intrusion of 17, banding of 18, 48 teeth was done in the posterior region. Both the arches were stabilized with 0.019 × 0.025″ SS wire (Figure 5.).

The Infrazygomatic crest bone screws[2] were placed subsequently in upper arch for anchorage reinforcement for retraction. 2x12 mm stainless steel Bone-screw were carefully selected for this purpose. Bone Screws were positioned so that the head of each device sat 5 mm higher than the soft tissue level. Long lever arm 8-9 mm long were placed distal to Lateral Incisors for bodily movement of anterior teeth. (Figure 6.). Sliding mechanics were utilized for En masse retraction procedure with an equal force of 200gm on both sides for 8 months.

FIGURE 5: Treatment progress- Extra oral photographs

FIGURE 6 : Treatment progress- IZC and long lever arms for retraction.

Here in this multidisciplinary case, dental element intrusion and arch alignment were achieved through orthodontic treatment. The main goal of this procedure was to provide space for prosthetic replacement which was almost impossible without orthodontic treatment.

The desired outcome after treatment included achieving a class I molar and canine relationship, as well as an ideal overjet and overbite. (Figure 7, 8.). Successful root parallelism was achieved without any significant evidence of root resorption. (Figure 9.). Comparison of cephalometric measurement before and after the treatment is displayed in Table 1. Settling of occlusion was carried out and patient was referred to Department of Prosthodontics for prosthetic replacement.

Once the prosthodontic treatment was complete, the orthodontic appliance was removed and retetntion appliances were given. Post treatment records showing normal overjet and overbite ,Intruded upper Second molar and normal inclination of anterior teeth were taken as shown in Figure 7,8,9.

FIGURE 7: Post treatment Extra oral photographs

FIGURE 8: Post treatment intra oral photographs

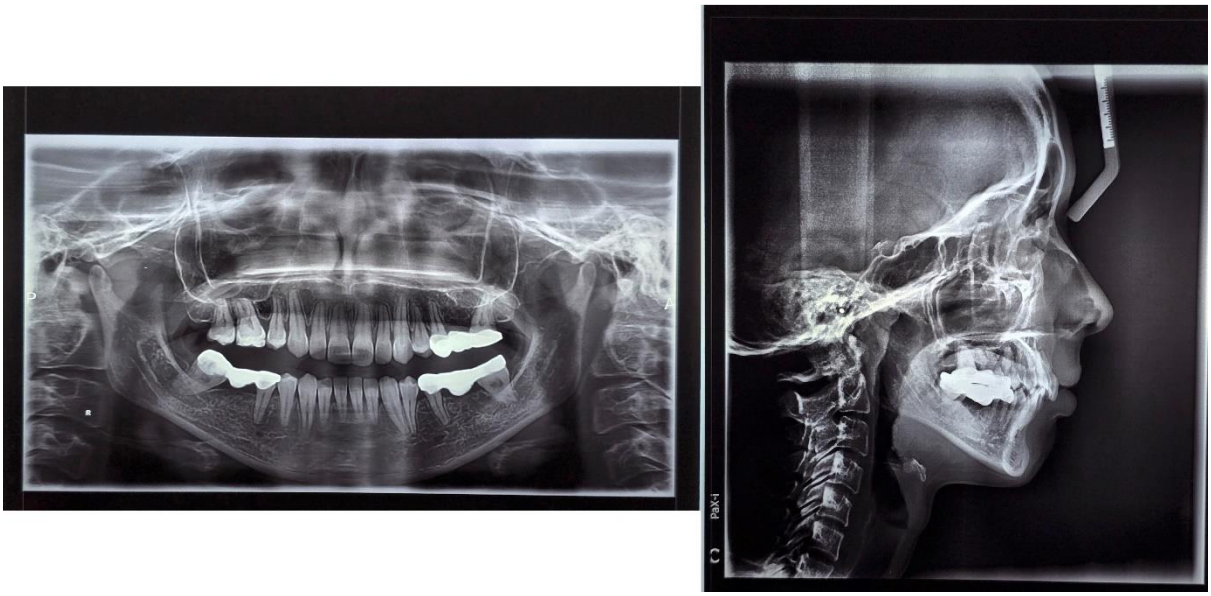

FIGURE 9: Post treatment radiographs

The patient was happy and she expressed her contentment with the final outcome of the treatment, and was pleased with the lovely and esthetically pleasing smile that was achieved at the end of treatment along with functional occlusion and follow up was maintained at every 6 months.
Two year Follow up records showing maintained results without any sign of relapse are shown in Figure 10,11.

FIGURE 10: Follow up extra oral photographs

FIGURE 11: Follow up intra oral photographs

Parameters	Pre-Treatment	Post- Treatment
Saggital Skeletal Relationship:		
SNA	79°	79⁰
SNB	71°	72⁰
ANB	8°	7⁰
Beta angle	23°	20⁰
Yen angle	112°	110⁰
W angle	48°	47⁰
Wits Appraisal	11mm	8mm
Dental Relationship:		
U1 to NA (mm/deg)	6mm / 31⁰	2.5mm/16⁰
L1 to NB (mm/deg)	4mm / 20⁰	5mm/24⁰
IMPA	86⁰	91⁰

Upper 1 to SN	113⁰	92⁰
Vertical Relationship:		
U1 to NA (mm/deg)	6mm / 31⁰	2.5mm/16⁰
L1 to NB (mm/deg)	4mm / 20⁰	5mm/24⁰
IMPA	86⁰	91⁰
Upper 1 to SN	113⁰	92⁰
Soft Tissue Relationship:		
GSnPg	20⁰	20⁰
Nose prominence	13mm	15mm
GSn/SnMe	0.9	1.04
CmSnLs	106⁰	120⁰
Ls-SnPg	4mm	2mm
Li-SnPg	3mm	4mm
Stms-Stmi	9mm	1mm

Table1. Evaluation of Pretreatment and Post treatment Lateral Cephalogram.

Discussion:

Performing molar intrusion can be a quite complex and challenging task when dealing with adult patients. Loss of 46,47 resulted in supraeruption of 17 in right quadrant.

The intrusion of supraerupted maxillary molars can be achieved by various treatment modalities such as transpalatal bar[3] anchorage from mini implant[4] etc.

In the present case NTRDC by Dr Toshniwal[1] was used which is very simple and cost effective. IZC were used for retraction and prosthetic replacement of the missing teeth were done.

The team work of the other specialities like prosthodontics and periodontics allowed us to get the optimal results.

Conclusion:

An individualised appropriate and through assessment must be conducted on the basis of careful evaluation of various biological, psychosocial and mechanical factors to develop a suitable treatment plan for an adult patient.

Multidisciplinary Approach gives the best results in these type of cases. However the limitatons of orthodontic treatment must be explained at the beginning of treatment since the expectations of adult patients regarding orthodontic treatment can be very high.

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