Case Report

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Ortho Perio Interdisciplinary Treatment in an Adult: A Case Report

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ABSTRACT

Background: In contemporary dental care, an increasing number of adult patients are seeking orthodontic treatment. In such adult patients, a combined orthodontic and other specialized therapy often offers the best option for achieving a predictable outcome to solve complex clinical problems. An interdisciplinary approach was used to treat a patient with pathological migration of teeth, severe anterior proclination and missing lower incisor due to chronic localized periodontitis. The combination of regenerative periodontal therapy and orthodontic treatment greatly improved function and esthetics. This article describes combined periodontal and orthodontic treatment in a young patient with severe chronic localized periodontitis and missing lower left central incisor. Periodontal therapy was carried out and after confirming the attachment gain and bone stability, orthodontic therapy was commenced which lasted for 23 months during which segmental mechanics and only light forces were used. The result of this intervention was satisfactory and long term periodontal outcome was achieved.

Keywords: Interdisciplinary treatment, chronic localized Periodontitis, gingival recession, segmental mechanics, Light forces.

INTRODUCTION

Dentofacial esthetics is of great concern in the adult population, with an increasing demand for orthodontic treatment in appearance-conscious adults [1]. In this group of patients the primary motivating factor is a desire to improve their dental appearance. Pathologic migration of anterior teeth is a common cause of esthetic concern among adults. Pathologic migration is defined as change in tooth position resulting from disruption of the forces that maintain teeth in normal position in relation to their arch. The disruption of equilibrium in tooth position may be caused by several etiologic factors like periodontal attachment loss, pressure from inflamed tissues, occlusal factors, oral habits such as tongue thrusting and bruxism, loss of teeth without replacement, gingival enlargement and iatrogenic factors. However, according to the literature, destruction of tooth supporting structures is the most relevant factor associated with pathologic migration. Periodontal disease in the upper anterior region can be in isolated or generalized. That may results in diastema, pathological migration, labial tipping or missing teeth often lead to functional and esthetic problems[12]. Advanced periodontal disease is characterized by severe attachment loss, reduced alveolar bone support, tooth mobility and gingival recession. Orthodontic treatment is initiated only after periodontal disease is brought under control. This communication highlights good treatment outcomes achieved in a patient with impaired Dentofacial aesthetics and advanced periodontal

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disease. During active orthodontic treatment, attention was paid to apply very light forces. This article describes combined periodontal and orthodontic therapy in a young patient with chronic localized periodontitis.

CASE REPORT

An 18 yr old female patient came to Department of Orthodontics and Dentofacial Orthopedics at SVS Institute of Dental Sciences Mahabubnagar, with the chief complaint of forwardly placed upper front teeth and spacing .Her extra oral examination revealed mesoprosopic facial form ,mild convex profile , potentially competent lips (interlabial gap of 13 mm)with short upper lip, lower lip averted .On smile patient showed 3mm of gingival display whereas at rest full crown was exposed with short upper lip (18mm).Intra oral examination exhibits bilateral class I molar relationship, proclination of upper anteriors, with pathological migration of 21 and spacing in lower arch and 31 was missing (Fig 1).

Cephalometric analysis showed class I basis (ANB 2^0,Witts appraisal of 1mm) with normodivergent growth pattern (FMA,27^0 ;Go – GnSN,24^0), Proclined upper incisors (UI-NA,45^0 /10mm;UI-SN,126^0)and mild Proclined of lower incisors(LI-NB,30^0/6mm;IMPA 97.Lower third molars were erupting. (Fig 2)..

Diagnosis and Treatment plan

Patient was diagnosed as Angles class I malocclusion with anterior spacing and proclination on skeletal class I jaw basis with normodivergent growth pattern, having potentially incompetent lips with short upper lip.

Treatment objectives were to improves Esthetics and masticatory function ad to enhance periodontal health by removing inflammatory diseases, as follows (1) obtained healthy gums (2) Correct the labial inclination of maxillary and mandibular arch (3) Close down spaces in maxillary and mandibular arch and to obtain ideal over jet and overbite (4) Obtained competency of lips (5) Evaluate the patients every 6 months for periodontal status with radiograph.

Fig 1: Pretreatment Extra oral and Intral photographs.

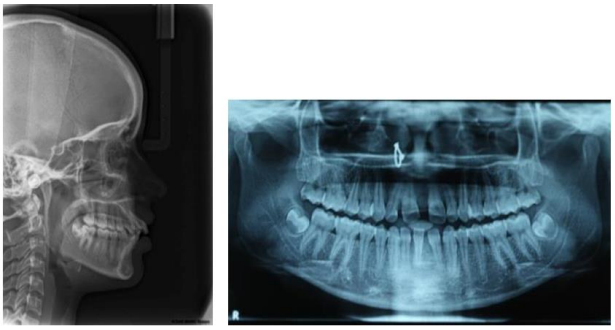

Fig 2: Pretreatment radiographs Lateral Cephalogram and Panaromic radiograph.

Treatment alternatives

Two options for achieving the treatment objectives were decided .The first was to treat the patient by non-extraction therapy without replacing 31 with segmental mechanics and mild forces. The second option was to extract both maxillary and mandibular premolars. This option would permit lingual retraction of the anterior teeth to resolve proclination but the treatment time would be relatively long and this could negatively affect periodontal health.

The treatment options were presented to the patient and discussed. For the maxillary and mandibular arch, the decision was made to treat the patient with flap surgery followed by non extraction therapy without replacement of 41 with mild forces. Patient agreed to proceed with this plan.

Periodontal evaluation

On periodontal evaluation (6-point probing with UNC -15 Probe) a maximum probing depth of 7mm was seen i.r.t to 11,21,41 suggestive of pathological tooth migration and probing depth of 7mm was also seen i.r.t 16,26,36,46 suggestive of trauma from occlusion. Not more than 30% of teeth had probing depth of more than 5mm.Bleeding from probing was observed i.r.t 11,21,16,26 during 6 point probing method. Corresponding to the above periodontal findings, case was diagnosed as Chronic Localized Periodontitis (CLP) i.r.t 11,21,16,26,41,36,46 and patient was posted for flap surgery (Fig 3).

Pre orthodontic treatment pocket depth (in millimeters)

Table 1: Pre orthodontic treatment pocket depth (in millimeters) in maxillary teeth.

Tooth No	17	16	15	14	13	12	11	21	22	23	24	25	26	27
Buccal	557	755	755	355	553	357	755	533	335	354	357	755	755	535
Lingual	557	553	355	553	335	555	553	555	333	553	355	557	577	555

Table 2: Pre orthodontic treatment pocket depth (in millimeters) in mandibular teeth.

Tooth No	47	46	45	44	43	42	41	32	33	34	35	36	37
Buccal	555	557	755	533	355	355	577	533	355	355	533	355	535
Lingual	553	557	553	335	553	335	335	553	335	575	755	577	555

Fig 3: Open flap debridement of maxillary anterior teeth

Post orthodontic treatment pocket depth (in millimeters)

Table 3: Post orthodontic treatment pocket depth (in millimeters) in maxillary teeth.

Tooth No	17	16	15	14	13	12	11	21	22	23	24	25	26	27
Buccal	335	755	555	355	553	355	533	533	335	354	355	555	533	535
Lingual	533	553	355	553	335	555	553	555	333	553	355	355	533	555

Table 4: Post orthodontic treatment pocket depth (in millimeters) in mandibular teeth.

Tooth No	47	46	45	44	43	42	41	32	33	34	35	36	37
Buccal	555	553	553	533	355	355	355	533	355	355	533	355	535
Lingual	553	355	553	335	553	335	335	553	335	555	355	553	555

Treatment progress

At the age of 18 years 3 months the mandibular left central incisor was extracted and flap surgery was performed. After periodontal reevaluation to ensure that most of the pockets were less than 3 mm. A preadjusted edgewise appliance with a 0.022 X 0.028-in slot was placed. The initial leveling and aligning process started with 0.012 Niti wire was placed in upper and lower arch. A 0.016X 0.022-in SS wire was placed in upper and lower arch during treatment periodontal evaluation was carried out and patient is advised to maintain oral hygiene strictly. To close the space in lower arch 0.019X0.025-in TMA with tear drop loop was given and upper long E chain was given and loop was activated every 1 month after 6 months. After 23 months orthodontic appliance was removed and fixed bonded retainer was given in upper and lower arch canine to canine .Two months after the initiation of the retention phase, periodontal evaluation was carried out every 3 months .The treatment results in improved facial esthetics and lip competency, Bilateral class I molar relationship with normal over jet and overbite was established and lower midline was shifted to right by 2mm and, the missing central incisor (31) spaces was successfully closed by loop mechanics(Fig 4). Post treatment Cephalometric analysis showed changes Cephalometric findings on comparison from pretreatment to post treatment revealed a great change in the axial inclinations of teeth from 126^0 of UI-SN, to 118^0, followed by of inter-incisal angle of 105^0 to 95^0. And mild increase of (FMIA) from 60^0 to 61^0 (Table 1).Cephalometric superimposition showed that the maxillary and mandibular were uprighted post treatment when compared to pre treatment. Pocket depths had decreased significantly. Panaromic and periapical radiograph confirmed flattening of the interpoximal bone topography. Good root parallelisum was obtained. No appreciable changes in bone level were seen (Fig 5).

DISCUSSION

Early diagnosis and treatment are essential for successful long term prognosis in patients with Chronic Localized Periodontitis. The role of an orthodontist in diagnosis and referral to periodontal treatment is crucial since most orthodontics patients are adults who are more susceptible to chronic localized periodontitis.

Fig 4: Post treatment extra oral and intra oral photographs.

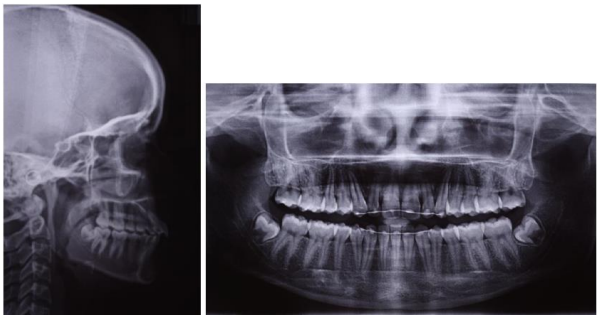

Fig 5: Post treatment radiographs Lateral Cephalogram and Panaromic radiograph.

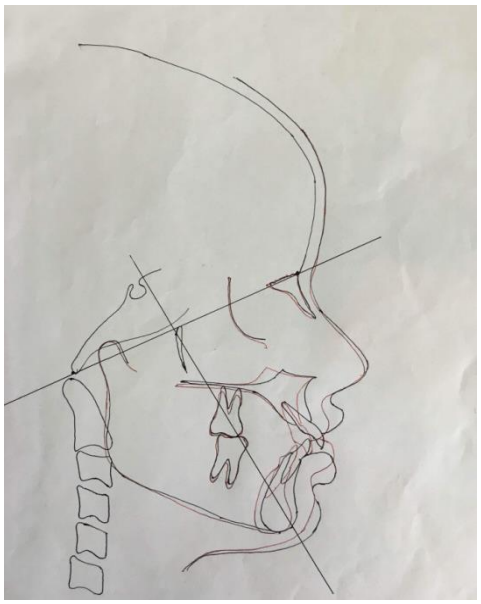

Fig 6: Superimposed pretreatment and post treatment radiograph.

Table 5: Pre treatment and post treatment Cephalometric measurement.

Hard Tissue parameter	Normal	Pre Rx	Post Rx
SNA	82	82^0	82^0
SNB	80	80^0	80^0
ANB	2	2^0	2^0
AO to BO	0-1mm	1mm	2.5mm
Na-Pog	0-5	5mm	0^0
N per A	2	1mm	1.5mm
N per B	-2	-1mm	4mm
FMA	25	24^0	25^0
Go-Gn-SN	32	27^0	27^o
Jarabak's Ratio	62-65	66.6	68.4%
UI – NA	22 /4mm	45^0	38mm
UI – SN	102	126^0	119^0
LI – NB	25 /4	30^0	26^0
LI – MP	190	97^0	94^0
LI - FH	65	60^0	59
UI – LI	131	105^0	114^0
Soft Tissue profile Angle	161	161^0	135^0
Naso labial Angle	102 8	95^0	100^0
Mentolabial Angle	122 10.7	100^0	120^0
Upper Lip thickness	12 - 15mm	10mm	8mm
Lower lip thickness	13 – 14mm	13mm	13mm

According to Hart et al, the diagnosis of localized aggressive periodontitis is based on attachment loss of not more than 2 permanent teeth other than the first permanent molar and incisors [8]. Subjects must be systemically healthy & less than 35 years of age. As described by Bodur et al 3 of the main features of localized aggressive periodontitis in an adolescent group are (1) presence of putative periodontal pathogens (2) mobility and loss of teeth (3) lack of cementum [2,15].

The case presented here included severe loss of attachment in first molar, incisor, canine and first premolars. Pathologic migration is defined as a change in tooth position resulting from disruption of the forces that maintain teeth in a normal position, with reference to the skull[3]. The clinical manifestation of pathologic migration such as proclination, diastema, rotation, extrusion, and drifting have been found in 30% to 50% of patients with moderate to severe periodontal diseases[11,12]. Since pathologic migration affects esthetics, it is frequently a chief complaint of periodontally involved patient [9]. The etiology of pathologic migration has not yet been clarified, but it is thought to be related to attachment loss and bone resorption based on clinical reports & observations.

This is a case report of 18 year old female patient who presented with proclination of upper anterior teeth with pathologic migration of 21 and spacing in lower arch. Because of the excessive proclination of the anterior teeth, it was difficult for her to close her lips leading to dryness in the oral cavity. The effectiveness of orthodontic treatment for patients with periodontal diseases is enhanced by eliminating inflammatory factors, creating access for oral hygiene and altering occlusal factors during tooth alignment[7]. It has also been reported that gingival or alveolar bone topography can be improved by altering the tooth inclination [10, 21]. The interval of orthodontic force of activation should be longer, because remodeling the periodontal tissue will take longer than in patients with healthy periodontal tissues [10].This change of reducing the proclination by closing the spaces in upper and lower anteriors facilitated esthetics. In addition, normal lip closure was established preventing dryness in the oral cavity. However thorough knowledge of peridontium and its relation to

orthodontic forces is essential for an orthodontist [4,7,9]. Lighter orthodontic forces must be applied to teeth with compromised bone support as larger forces can negatively affect the periodontal membrane.

In this patient total treatment was carried out for 28 months. Initial periodontal conditions were improved by flap surgery before the start of the orthodontic treatment. Segmental mechanics were employed with a preadjusted edgewise orthodontic appliance. Space closure in lower arch was carried out by loop mechanics. The force system of segmented mechanics easily delivers predictable force throughout the treatment and achieves an optimum biological response[7]. During the treatment, strict oral hygiene regimen including tooth brushing, chlorhexidine mouthwash and professional cleaning every 6 weeks was followed during the treatment. Spaces were successfully closed in both the arches and lower midline was compromised as 31 was extracted due to poor periodontal prognosis and mobility. With these interdisciplinary procedures, it is possible to distribute occlusal stresses broadly and create an environment conducive to good oral hygiene even in a severely periodontally compromised situation. Some authors have reported that orthodontic tooth movement is possible without further bone or attachment loss if the active treatment time is delayed until the inflammation is under control [5,9,15]. In order to prevent any further relapse patient was bonded with a fixed retainer in both the arches.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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