International Journal Dental and Medical Sciences Research
Volume 4, Issue 1, Jan-Feb 2022 pp 254-260 www.ijdmsrjournal.com ISSN: 2582-6018

Orthodontic Intervention for Psychological Improvement of Severely Periodontally Compromised Adult Female- A Case Report

Dr Rajib.K.Seal[1], Dr Srijani Sarkar[2]
[1]*Associate Professor, Department of Orthodontics; North Bengal Dental College and Hospital*
[2]*BDS, Junior Resident Dental Surgeon, North Bengal Dental College and Hospital*

Submitted: 15-01-2022 Revised: 23-01-2022 Accepted: 26-01-2022

ABSTRACT
Periodontal disease which is very commonly prevalent in general population often remain undiagnosed and if left untreated can lead to attachment loss and may cause severe pathological migration of teeth resulting in unaesthetic appearance and compromised function in adult patients. The malocclusion has a severe impact on psychological status of the individual. This article describes an orthodontic approach to improve psychological well-being of an adult female patient by means of fixed orthodontic mechanotherapy.
Keywords: Orthodontic tooth movement; periodontal therapy; psychological health

I. INTRODUCTION

Periodontitis, an autoimmune disease, leads to severe horizontal bone loss and brings upon awkward esthetics and is a reason for being psychologically affected. The correction of the mal-positioned teeth improves facial esthetics and permits access to better oral hygiene of the individual. However, it can be challenging and confusing to start fixed orthodontic treatment for these patients with an assumption that orthodontic forces may make the teeth mobile. The reasons behind these assumptions are twofold. It is found that patients with poor periodontal health are unable to follow adequate oral hygiene maintenance regimen leading to horizontal bone loss and reduction of bony support. Another reason is that nearly all patients undergoing fixed orthodontic treatment have some degree of gingivitis, where gingival enlargement might increase multiple folds in periodontally compromised patients [2,3,4,6].

Derrick Willmot [1], University of Sheffield, UK however suggests when loss of attachment in orthodontic patients compared with controls was examined, 10% had significant attachment loss but 50% had no attachment loss. He shows about 0.2-0.3mm bone loss in patients maintaining good oral hygiene, while about 1-2mm of horizontal bone loss was noted in patients with poor oral hygiene.

Adult periodontally compromised patients often present with drifting of teeth with spacing, leading to aggravated malocclusion. Evidence suggest that if high quality periodontal intervention can be carried out and patients can follow hygiene procedures, fixed orthodontic treatment can be carried out successfully even in presence of horizontal bone loss. The primary pre-requisite is to stabilize periodontal disease before commencement of orthodontic therapy [1,4,5].

Bone loss alters the position of centre of resistance of teeth, resulting it to move apically. There is increase in clinical crown height due to horizontal bone loss and gingival recession. Orthodontic treatment is carried out with extremely light force to rule out any further bone loss. Tip-edge or Pre-adjusted Edgewise Appliance is preferred to ensure bodily movement or controlled tipping [1]. Permanent retention and also long term retention with removable retainers are generally needed in periodontally compromised adult patients.

II. CASE REPORT

Mrs. S. Khatoon(S.K) aged 43 years with advanced periodontitis and drifted incisors reported at OPD of Department of Orthodontia, North Bengal Dental College and Hospital. Psychologically sick, mentally depressed, she had proclined incisors, incompetent lips resulting in an unaesthetic facial appearance and smile.

On clinical examination, she was found to have poor oral hygiene with aggregated plaque and calculus deposition. Moreover, she had generalized gingival recession without any active gingivitis and tooth mobility. There was generalized spacing and pathologic tooth migration.

Pre-treatment photographs

International Journal Dental and Medical Sciences Research
Volume 4, Issue 1, Jan-Feb 2022 pp 254-260 www.ijdmsrjournal.com ISSN: 2582-6018

Fig 1: Extraoral and Intraoral photographs of a periodontally compromised 43 years old female patient

Considering her psychological illness due to severity of malocclusion, it was decided to treat her with MBT Preadjusted Edgewise Appliance after thorough oral prophylaxis and Phase-I periodontal therapy. Alignment and leveling was done with 0.014 NITI wire followed by consolidation of spaces between the incisors which was done using 0.018 stainless steel wire. Unfortunately, even after several instructions, she could not carry out oral hygiene measures adequately resulting in frequent plaque and calculus deposition. Ultimately, the incisors were intruded and retracted with very light orthodontic

International Journal Dental and Medical Sciences Research
Volume 4, Issue 1, Jan-Feb 2022 pp 254-260 www.ijdmsrjournal.com ISSN: 2582-6018

force of about 60-100 grams on 19X25 stainless steel wire.

In-Treatment Photographs

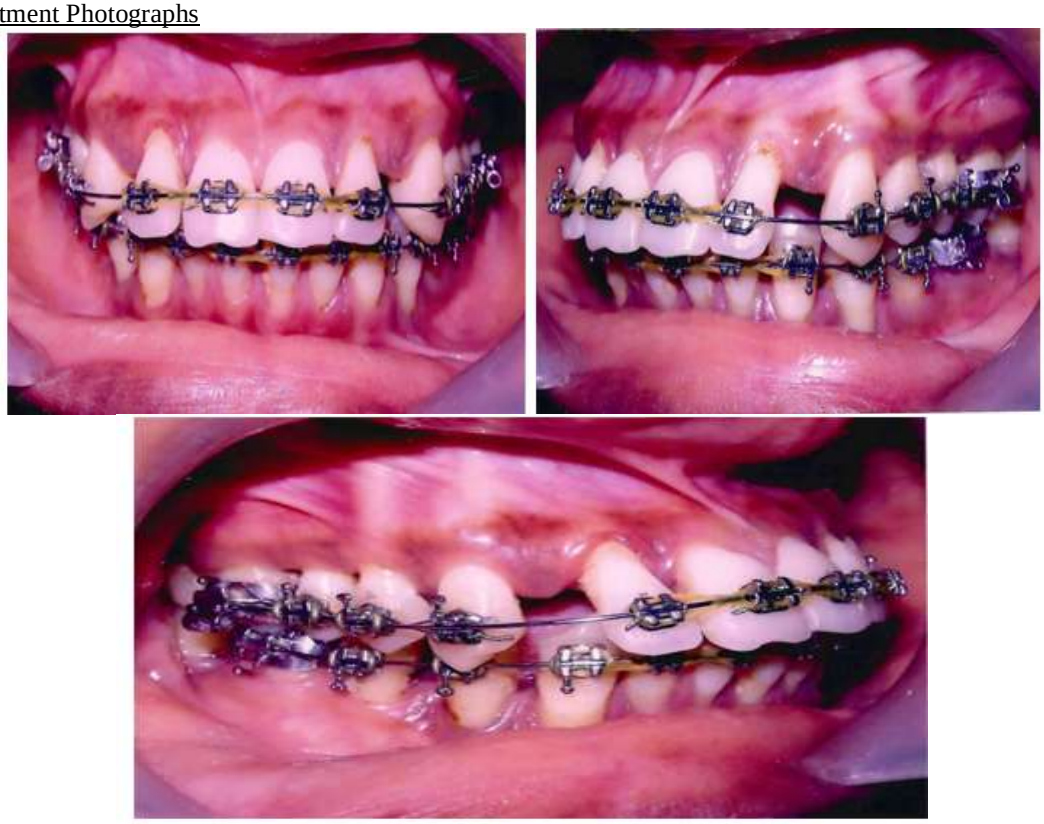

Fig 2: Intraoral photographs taken after initiation of treatment

Fig 3: Extraoral facial profile after initiation of treatment

International Journal Dental and Medical Sciences Research
Volume 4, Issue 1, Jan-Feb 2022 pp 254-260 www.ijdmsrjournal.com ISSN: 2582-6018

After 17 months of treatment, there was space closure and great deal of improvement in aesthetic was seen but the appliance had been removed prematurely as the patient was unable to maintain oral hygiene with braces.

Post- Treatment Photographs

Fig 4: Intraoral photographs taken after debonding shows signicant space closure

Fig 5: Mrs. S. Khatoon was provided with removable Hawley retainer for the maxillary and mandibular arch after debonding in the retention phase of the treatment.

International Journal Dental and Medical Sciences Research
Volume 4, Issue 1, Jan-Feb 2022 pp 254-260 www.ijdmsrjournal.com ISSN: 2582-6018

Fig 6: Extraoral facial profile after debonding shows significant improvement of aesthetics after 17 months

III. DISCUSSION

Periodontitis being an inflammatory disease affecting the periodontium, its etiology lies both in the presence of local factors and the host immune response. Local factors include poor oral hygiene maintenance leading to accumulation of plaque and change in the microbiome to Red complex bacteria including Porphyromonas gingivalis,Treponema denticola, Tannerella forsythia [8]. The presence of such local factors coupled with both innate and acquired immunity of the host paves the pathway to an established disease as was seen in case of Mrs. S,Khatoon.

The bacteria in the plaque stimulate fibroblasts and epithelial cells in periodontal cell as well as immunocytes of the host including myeloid cells and lymphocytes to secrete pro-inflammatory cytokines including IL-1, IL-6, TNF-alpha. These cytokines activate various signaling pathways in the host cell and promote myeloid cells inducing osteoclatic activity through inhibition of osteoblasts and differentiation of Th-1, Th-2, TH17. Activation of osteoclasts takes place with the help of 3 potential mediators namely RANKL, RANK and Osteoprotegrin. RANKL is a membrane bound protein which binds to its receptor RANK on pre-osteoclast cells to differentiate into mature osteoclasts which in turn encourages bone loss. If the disease progression is not intervened, more and more bone loss results in pocket formation and attachment loss as great as 6mm and 4mm respectively. These leave the dentition devoid of its bony support leaving them susceptible to deleterious masticatory forces resulting in migration. Pathological migration can be seen occurring mesially characterized with spacing, tilting and extrusion of dentition resulting in unaesthetic appearance [7,8].

There are three school of thoughts concerning the pathological drifting of teeth-1. Increase in hydraulic pressure occurs as more and more fluid flows from capillaries to the interstitium due to tissue inflammation. 2. Increase in ground substance and swelling causes loss of tonicity in the soft tissue. 3. Inflammation weakens the transseptal fibers causing easy drifting [9].

IV. CONCLUSION

Chronic periodontal disease, mostly an autoimmune disorder is responsible to horizontal bone loss and resultant pathologic tooth migration and spacing between incisors, which brings upon very unaesthetic facial appearance and smile of the adult individual leading to severe psychological break down and very poor quality of life. Even resourceful people may suffer from similar illnesses due to this kind of poor hygiene and periodontal health.

If proper motivation and counseling to maintain proper oral hygiene can be provided to adult periodontally compromised patients, elaborate and thorough periodontal therapy and well planned orthodontic biomechanics can greatly improve facial appearance and smile with great improvement of psychological health.

REFERENCES

[1]. Derrick Willmot **Orthodontic Teatment and the Compromised Periodontal Patient** European Journal of Dentistry; 2008 Jan; 2: 1-2; PMCID: PMC2633146

[2]. Samah Alfuriji, Nora Alhazmi, Nasir Alhamlan, Ali Al-Ehaideb, Moatazbellah Alruwaithi, Nasser Alkatheeri, Amrita Geevarghese **The Effect of Orthodontic Therapy on Periodontal Health: AReview of the Literature** International Journal of Dentistry; Volume 2014; Article Id:585048

[3]. R L Boyd [1], P J Leggott, R S Quinn, W S Eakle, D Chambers **Periodontal implications of orthodontic treatment in adults with reduced or normal periodontal tissues versus those of adolescents** Am J Orthod Dentofacial Orthop.1989 Sep;96(3):191-8

[4]. J Artun [1], K S Urbye **The effect of orthodontic treatment on periodontal bone support in patients with advanced loss of marginal periodontium** Am J Orthod Dentofacial Orthop. 1988 Feb;93(2):143-8. doi: 10.1016/0889-5406(88)90292-2

[5]. S Williams, B Melsen, N Agerbaek, V Asboe **The orthodontic treatment of malocclusion in patients with previous periodontal disease** Br J Orthod 1982 Oct;9(4):178-84. doi: 10.1179/bjo.9.4.178

[6]. K Paunio **The role of malocclusion and crowding in the development of periodontal disease** Int Dent J. 1973 Sep;23(3):470-5

[7]. P PTowfighi [1], M A Brunsvold, A T Storey, R M Arnold, D E Willman, C A McMahan **Pathologic migration of anterior teeth in patients with moderate to severe periodontitis** J Periodontol. 1997 Oct;68(10):967-72.doi: 10.1902/jop.1997.68.10.967

[8]. Weiyi Pan1 , Qingxuan Wang1 and Qianming Chen **The cytokine network involved in the host immune response to**

periodontitis International Journal of Oral Science (2019) 11:30

[9]. Rajeshree Rangari and Chandrasekhara Reddy **ETIOLOGY OF PATHOLOGICAL TOOTH MIGRATION RELATED TO PERIODONTAL DISEASES A COMPREHENSIVE REVIEW** International Journal of Current Research Vol. 8, Issue, 08, pp.36362-36364, August, 2016

…