SCIENTIFIC ARCHIVES OF DENTAL SCIENCES (ISSN: 2642-1623)

Volume 3 Issue 8 August 2020

Case Report

Periodontal Reinsertion after Orthodontic Intrusion in a Patient Presenting Aggressive Periodontitis: An 18-Years Follow-Up Case

Mahingler Aparecida Tonan dos Santos[1], Ariane de Freitas dos Santos[1], Thiago Gregnanin Pedron[2], Caleb Shitsuka[3] and Irineu Gregnanin Pedron[4]*

[1]*Undergraduate Student, Universidade Brasil, Sao Paulo, Brazil*

[2]*Orthodontist, Private Practice, Sao Paulo, Brazil*

[3]*Professor, Department of Pediatric Dentistry and Cariology, Universidade Brasil, Sao Paulo, Brazil*

[4]*Professor, Department of Periodontology, Implantology and Stomatology, Universidade Brasil, Sao Paulo, Brazil*

***Corresponding Author:** Irineu Gregnanin Pedron, Professor, Department of Periodontology, Implantology and Stomatology, Universidade Brasil, Sao Paulo, Brazil. **E-mail:** igpedron@alumni.usp.br

Received: June 17, 2020; **Published:** July 11, 2020

Abstract

Aggressive periodontitis, which affects especially young and healthy individuals, is characterized by deep periodontal pocket of quick progression, severe bone loss, migration and dental loss. Patients presenting aggressive periodontitis may demand multidisciplinary dental care, together with periodontal therapy. The purpose of this article is to present a case of aggressive periodontitis that whose treatment included basic and surgical periodontal care, endodontic treatment, orthodontic therapy (orthodontic intrusion) and concluded with aesthetic periodontal surgery, with periodontal reinsertion. The patient still receives semiannual periodontal maintenance and the case has been followed for 18 years. Complementary treatment modalities were discussed.

Keywords: Aggressive Periodontitis; Pre-Pubertal Periodontitis; Juvenile Periodontitis; Early-Onset Periodontitis; Rapidly Progressive Periodontitis; Periodontal Diseases; Treatment

Introduction

Aggressive periodontitis presents wide synonymy: pre-pubertal periodontitis, juvenile periodontitis, early-onset periodontitis and rapidly progressive periodontitis. However, in 1999 this new nomenclature was established, through a discerning evaluation of some incomplete, inadequate or insufficient criteria [1-3].

Aggressive periodontitis, which affects especially young and healthy individuals, is characterized by deep periodontal pocket of quick progression, severe bone loss, migration and dental loss, usually with a symmetric bilateral pattern [4,5]. Another peculiar characteristic is the predilection for black women [3,4,6].

Gram negative anaerobic microorganisms are the periodontal pathogens frequently involved in the etiopathogeny of aggressive periodontitis, particularly *Aggregatibacter actinomycetemcomitans* [2-4,6-10].

The treatment accomplished with basic periodontal therapy associated with systemic antibiotics. Depending on the severity of the periodontal implication, complementary treatments may be necessary, by means of orthodontics, endodontics, oral surgery and oral rehabilitation, in order to restore aesthetics [11-13].

The purpose of this article is to present a case of aggressive periodontitis whose treatment included basic and surgical periodontal care, endodontic treatment, orthodontic therapy (orthodontic intrusion) and concluded with aesthetic periodontal surgery, with periodontal reinsertion. The patient still receives semiannual periodontal maintenance and the case has been followed for 18 years.

Case Report

A Caucasian female healthy patient, 16-year-old, attended to private practice with complain dental mobility. She presented gingival inflammation, in despite of little biofilm accumulation, deep periodontal pockets, dental extrusion and gingival retraction in tooth 21 and a diastema between teeth 11 and 12 (Figure 1). Radiographs identified angular bony defects in the area of inferior and superior incisors (Figure 2) and first molars. Past medical history, and clinical and radiographic findings were suggestive of aggressive periodontitis.

Figure 1: Initial clinical aspect of the patient presenting aggressive periodontitis: light low gingival inflammation and little accumulation of dental biofilm; dental extrusion (21) and periodontal retraction; diastema between teeth 11 and 12.

Figure 2: Initial radiographic aspect of anterior upper incisors.

Basic periodontal treatment started through sessions of scaling and root planing, oral hygiene instruction and temporary contentions (of teeth 13 to 23 and 33 to 43). In addition, chemical disinfection during periodontal treatment was accomplished with 24% EDTA gel in neutral pH associated with systemic antibiotic therapy (Tetracycline 500 mg each 12 hours for 30 days). Endodontic treatment was accomplished in the elements 11, 12, 21, 22, 31 and 41, due to the adjacent bony loss and dentine hypersensitivity reported during scaling procedures.

Orthodontic treatment lasted 14 months, it started with total fixed orthodontic appliance to correct the diastema between teeth 11 and 12 and the overbite, overjet and extrusion of tooth 21. Cooper Ni-Ti™ wire (Thermo-active at 35ºC, 0.16") was first used for leveling, alignment and closing of spaces and, in vertical alterations, the TMA wire (Titanium Molybdenum Alloy 0.17 X 0.22") was used. The subsequent adaptation of dental arcades format was gotten with "0.16 X 0.16" stainless steel wire, that can be resigned. During the orthodontic treatment, maintenance periodontal therapy was instituted.

After intrusion of tooth 21 (Figure 3), aesthetic surgery was accomplished through sub epithelial connective graft over the region of gingival retraction, as described in Langer and Langer technique [14]. After preparation of receiver area, a 10-millimeter fragment of connective tissue was removed with a double blade scalpel from the donor area (hard palate). The graft was positioned in the receiver area simultaneously sutured with the flap with absorbable 6-0 suture and covered with surgical cement. The donor area was only sutured and first intention healing was waited, as a consequence of the use of the double blade scalpel.

Figure 3: Orthodontic treatment with intrusion of teeth 21.

Figure 4: Final clinical aspect after accomplishment of orthodontic treatment and surgery for sub epithelial connective tissue graft in the area of tooth 21 gingival retraction.

The patient was observed 30 days after these procedures, and then, once a month. Figure 4 shows the aesthetic result obtained after the surgery for sub epithelial connective tissue graft insertion. The area of initial gingival retraction was probed. Patient related pain at 3 millimeters of probing depth, which indicated reinsertion of gingival fibers (Figure 5).

Figure 5: Probing of the graft area, with pain response and resistance at 3mm indicating gingival reinsertion.

In a second occasion, frenectomy was accomplished, due to the presence of a moderate superior labial frenum and little amount of keratinized gingiva in the area of gingival retraction, even after the graft.

Nowadays, 18 years after the beginning of the treatment the patient is still under maintenance periodontal therapy, without signs of recurrence. Due to orthodontic therapy the patient still uses contentions in anterior teeth in both arcades (Figure 6 and 7).

Figure 6: Current clinical aspect, with intrusion of tooth 21 and root covering in the area of gingival retraction.

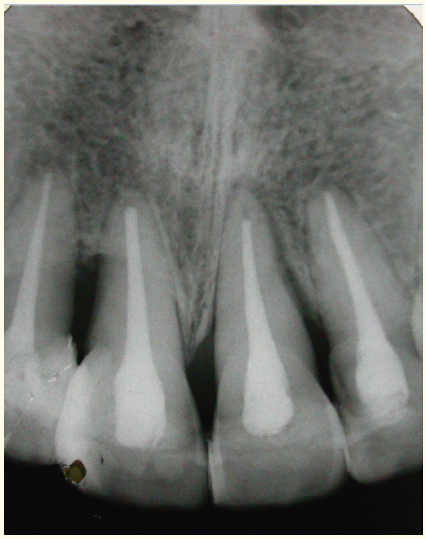

Figure 7: Current radiographic aspect of anterior upper incisors.

Discussion

Gingival retraction, traumatism, endodontic involvement and inadequate dental positioning were the main clinical characteristics inherent to aggressive periodontitis [3], as presented in this report. The procedures accomplished in this study longed for teeth preservation and stabilization of the aggressive periodontitis.

In case of aggressive periodontitis, basic periodontal treatment, considering scaling and root planing, systemic antibiotics and chemical control, are always associated with oral hygiene instruction. Endodontic and orthodontic treatment, as reported here, and also, extractions, occlusal adjustment and root amputations, are complementary treatments [3,5-7,9-11,15]. A daily dose of 1g of tetracycline for 30 days, associated with basic periodontal treatment must have been responsible for epithelial and bony replacement in angular defects [4]. The authors also emphasized the importance of treatment individualization, as in the present study, which objectified to supply the needs of the case.

The association of systemic antibiotics with local treatment (surgical or non-surgical) has been reported in the literature [4-7,10,11,16]. The reduction of pocket bleeding to probing through the association of systemic antibiotics with non-surgical treatment was reported [17]. Besides tetracycline use, systemic use of metronidazole, alone or associated with amoxicillin, has been suggested [7,10,18]. Systemic administration of 1g of tetracycline for 2 to 4 weeks, in agreement with the present performance (for 30 days), was indicated [6]. The authors complemented that, besides suspending infection, it could sustain bony regeneration. Also, topic use of 2% minocycline, 25% metronidazole, 8,5%, doxycycline in gel form, fiber of 25% tetracycline and chip of 25% chlorhexidine, has been reported [18].

Periodontal therapy, before or during orthodontic treatment, as well as maintenance periodontal therapy is indispensable [9,12,13,15,19-21]. The presence of periodontal disease during orthodontic treatment can exacerbate pathological processes [9,12,13].

Benefits after the association of orthodontic intrusion and periodontal treatment have been reported [9,12,15,21-23]. Dental intrusion must result in cement neoformation, reinsertion of collagen fibers in variable degree, and no loss of marginal bone if light intrusion forces and basic periodontal treatment are employed during the orthodontic therapy [22,23]. Fiber reinsertion must have been originated from periodontal ligament cells, derived from gingival connective tissue or alveolar bone [23]. However, some studies reported root resorption and worsening of angular bony defects current of orthodontic intrusion [15]. When gingival inflammation is present it can cause height alveolar bony loss [19,20]. In patients with aggressive periodontitis under orthodontic intrusion, there was an increment of periodontal disease activity, when the control of dental biofilm was inadequate, caused by the dislocation of supra gingival plaque into sub gingival plaque, resulting in the formation of pockets under bony level and loss connective tissue reinsertion [5]. Recently, it was observed that teeth with an abnormal root, lower teeth, anterior teeth and teeth with high residual alveolar bone height were factors unfavorable to bone gain in patients with aggressive periodontitis [24].

Periodontal improvement, represented by the reduction of periodontal pocket depth, bony remodeling of alveolar crest, bony maintenance, without increase of pocket depth neither gingival retraction, reduction of overbite and overjet, improvement of labial competence, equivalence of dental and facial medium lines and, consequently, improvement of the self-esteem and self-confidence were obtained with orthodontic intrusion in teeth with periodontal involvement [19,20].

Orthodontic treatment, however, can cause degenerative and/or inflammatory responses in pulp of periodontal compromised teeth even with complete apical root formation. Endodontic treatment, when previously accomplished, reduced significantly apical root resorption [25-27].

Characteristics of the present case, such as ample and isolated gingival retraction, insufficient amount of keratinized gingival tissue besides gingival retraction indicated sub epithelial connective tissue graft technique, proposed by Langer and Langer (1985) [14]. Color and texture of adjacent connective tissue, little injury to donor area and first intention reparation were the advantages obtained. The excellent plaque control daily accomplished by the patient was fundamental for the success of the treatment.

Fiber reinsertion after root covering using sub epithelial connective tissue graft was reported [16]. In the present study, one month after periodontal surgical procedure, the gingival sulcus was

probed in the area of the ancient gingival retraction. It presented resistance and pain at 3 millimeters of probing depth. Cement neoformation and reinsertion of collagen fibers were cited [28]. Variable results were found: 40 to 50% of the coverage occurred with connective tissue and 50 to 60% with epithelial tissue. Root conditioning, through topic application of citric acid, has demonstrated excellent results, with cement neoformation and reinsertion of collagen fibers, as was also observed in this case. The omission of root conditioning can result in the formation of long junctional epithelium. The accomplishment of root conditioning, besides disinfection (antibacterial effect), removes the smear-layer accumulated during instrumentation. It also promotes the exposure of cement or dentine matrix collagen fibers, of the proteins of active extra cellular matrix or root surface growth factors [28]. Other studies showed positive results with regenerative procedures using enamel matrix derivatives (Emdogain™, Straumann) in cases of large bone losses [12,13].

The preservation of aggressive periodontitis must be rigid with constant evaluation of plaque control, gingival bleeding, pocket probing, bony loss and microbiological analysis [4,10].

Conclusion

Based in clinical evidence and in the present literature review, it can be concluded that:

1. Among many modalities of treatment used for aggressive periodontitis, basic periodontal therapy is condition *sine qua non* for the maintenance and healthy stability of the periodontium.
2. Endodontic treatment is recommended for prevention of root resorption before orthodontic treatment or to treat severe dentine hypersensitivity after root planing.
3. Orthodontics played a fundamental role in the adjustment of occlusion, through the intrusion and alignment of the arches. During orthodontic treatment, variable sequences of orthodontic wires are suggested, but it is prudent to individualize each case, as in the present case. The coherent use of orthodontic wires together with an efficient diagnoses and planing resulted in satisfactory orthodontic results in a short period of time.
4. Sub epithelial connective tissue graft presented satisfactory aesthetic result and frenectomy was necessary with the objective of avoiding progression keratinized gingiva loss in the area of gingival retraction.
5. Independent of the employed treatment, support periodontal therapy must always be rigid.

Bibliography

1. Armitage GC. Development of a classification system for periodontal disease and conditions. Ann Periodontol. 1999;4(1):1-6.
2. Lang N, Bartold PM, Cullinan M, Jeffcoat M, Mombelli A, Murakami S, Page R, Papapanou P, Tonetti M, Van Dyke T. Consensus Report: Aggressive Periodontitis. Ann Periodontol. 1999;4(1):53.
3. Tonetti MS, Mombelli A. Early-onset periodontitis. Ann Periodontol. 1999;4(1):39-52.
4. Donly KJ, Ashkenazi M. Juvenile periodontitis: a review of pathogenesis, diagnosis and treatment. J Clin Pediatr Dent. 1992;16(2):73-78.
5. Folio J, Rams TE, Keyes PH. Orthodontic therapy in patients with juvenile periodontitis: clinical and microbiologic effects. Am J Orthod. 1985;87(5):421-431.
6. Yaffe A, Sommer M. A multidisciplinary approach for localized juvenile periodontitis: a case report. Compend Contin Educ Dent. 1993;14:168-174.
7. Efeoglu E, Sandalli P. A 14-year follow-up study of localized juvenile periodontitis treated by scaling and root planing, systemic metronidazole, and subgingival curettage: a case report. Periodontal Clin Investig. 1996;18(2):6-12.
8. Mullally BH, Dace B, Shelburne CE, Wolff LF, Coulter WA. Prevalence of periodontal pathogens in localized and generalized forms of early-onset periodontitis. J Periodontal Res. 2000;35(4):232-241.
9. Sanders NL. Evidence-based care in orthodontics and periodontics: a review of the literature. J Am Dent Assoc. 1999;130(4):521-527.

10. Worch KP, Listgarten MA, Korostoff JM. A multidisciplinary approach to the diagnosis and treatment of early-onset periodontitis: a case report. J Periodontol. 2001;72(1):96-106.

11. Worch KP, Listgarten MA. Treatment considerations in rapidly progressive periodontitis: a case report. Compend Contin Educ Dent. 1998;19(12):1203-1216.

12. Passanezi E, Janson M, Janson G, Passanezi-Sant'Anna A, Freitas MR, Castanha-Henriques JF. Interdisciplinary Treatment of Localized Juvenile Periodontitis: A New Perspective to an Old Problem. Am J Orthod Dentofacial Orthop. 2007;131(2):268-276.

13. Petit C, Huck C, Amar S, Tenenbaum H. Management of Localized Aggressive Periodontitis: A 30-year Follow-Up. Quintessence Int. 2018;49(8):615-624.

14. Langer B, Langer L. Sub epithelial connective tissue graft technique for root coverage. J Periodontol. 1985;56(12):715-720.

15. Johal A, Ide M. Orthodontics in the adult patient, with special reference to the periodontally compromised patient. Dent Update. 1999;26(3):101-108.

16. Goldstein M, Boyan BD, Cochran DL, Schwartz Z. Human histology of new attachment after root coverage using sub epithelial connective tissue graft. J Clin Periodontol. 2001;28(7):657-662.

17. Palmer RM, Watts TLP, Wilson RF. A double-blind trial of tetracycline in the management of early onset periodontitis. J Clin Periodontol. 1996;23(7):670-674.

18. Choudhury M, Needleman I, Gillam D, Moles DR. Systemic and local antimicrobial use in periodontal therapy in England and Wales. J Clin Periodontol. 2001;28(9):833-839.

19. Rabie ABM, Deng YM, Jin LJ. Adjunctive orthodontic treatment of periodontally involved teeth: case reports. Quintessence Int. 1998;29(1):13-19.

20. Sam K, Rabie ABM, King NM. Orthodontic intrusion of periodontally involved teeth. J Clin Orthod. 2001;35(5):325-330.

21. Carvalho CV, Saraiva L, Bauer FPF, Kimura RY, Souto MLS, Bernardo CC, Pannuti CM, Romito GA, Pustiglioni FE. Orthodontic Treatment in Patients With Aggressive Periodontitis. Am J Orthod Dentofacial Orthop. 2018;153(4):550-557.

22. Melsen B. Tissue reaction following application of extrusive and intrusive forces to teeth in adult monkeys. Am J Orthod. 1986;89(6):469-475.

23. Melsen B, Agerbaek N, Eriksen J, Terp S. New attachment through periodontal treatment and orthodontic intrusion. Am J Orthod Dentofac Orthop. 1988;94(2):104-116.

24. Shen X, Shi J, Xu L, Meng HX. Influential factors related to the long-term effect of periodontal-orthodontic treatment in patients with aggressive periodontitis and malocclusion. Zhonghua Kou Qiang Yi Xue Za Zhi. 2020;55(2):86-92.

25. Hamilton RS, Gutmann JL. Endodontic-orthodontic relationships: a review of integrated treatment planing challenges. Int Endod J. 1999;32(5):343-360.

26. Mirabella AD, Artun J. Prevalence and severity of apical root resorption of maxillary anterior teeth in adult orthodontic patients. Eur J Orthod. 1995;17(2):93-99.

27. Spurrier SW, Hall SH, Joondeph DR, Shapiro PA, Riedel RA. A comparison of apical root resorption during orthodontic treatment in endodontically treated and vital teeth. Am J Orthod Dentofacial Orthop. 1990;97(2):130-134.

28. Trombelli L. Periodontal regeneration in gingival retraction defects. Periodontol 2000. 1999;19:138-150.

Volume 3 Issue 8 August 2020