



Conservative Surgical Management of Localized Aggressive Periodontitis: A Case Report

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ABSTRACT

The common form of periodontitis which generally occurs in the adult population above the age of 35 years is chronic periodontitis. When a rapid alveolar destruction is observed in the patient, age below 25 years without any local and systemic contributing factors, an aggressive form of periodontitis can be suspected. Although familial aggregation was generally observed among the patients, the mode of inheritance varies in different geographical location, population, and race. Further, when a presented patient has severe attachment loss and bone loss confined to permanent first molars and incisors, it is suggestive of localized aggressive periodontitis. Here, we presented a case of localized aggressive periodontitis which was managed by conservative flap surgery without the use of any bone graft materials.

Keywords: attachment loss, bone graft materials, flap surgery, inheritance, periodontitis.

Introduction

Aggressive periodontitis is a rare form of periodontitis, characterized by rapid periodontal tissue destruction in systemically healthy individuals.¹ In 1999, Lang et al.² have delineated the primary and secondary features of Aggressive periodontitis. The Primary features of Aggressive periodontitis are rapid attachment loss and bone loss, familial aggregation and except having periodontitis patients are systemically healthy. The secondary features that usually present in aggressive periodontitis may not be always present. These features include: 1) The amount of plaque (i.e., microbial deposits) is inconsistent with the amount

of periodontal tissue destruction, 2) There may be elevated levels of *A. actinomycetemcomitans* while in some other population *P. gingivalis* may be elevated, 3) Phagocyte abnormalities may exist, as well as hyper-responsive macrophage phenotype may also be present that lead to the elevated production of proinflammatory cytokines like IL-1 β and PGE2 in response to microbial challenge, 4) The progression of attachment loss and bone loss may self-arrest. Based on clinical presentation, aggressive periodontitis is further classified into two forms: localized aggressive periodontitis and generalized aggressive periodontitis. Localized aggressive periodontitis is characterized by rapid

interproximal attachment loss and bone loss in at least two permanent teeth, one of which is first permanent molar and involving not more than 2 teeth other than first molars and incisors; occurrence in circumpubertal age and robust antibody response to infecting microorganism.² This case report describes a case of localized aggressive periodontitis which was treated with antibiotic therapy and conservative flap surgery in a 21-year-old female patient that was successful in maintaining dental integrity.

Case Report

A 21-year-female presented to Department of Periodontology and Oral Implantology with a chief complaint of gum bleeding for 3 months during brushing. The patient denied of having any systemic disease. When inquired about family history, she told that her mother had lost most of her teeth in the early 4th decade. She was a non-smoker and non-alcoholic. Intraoral examination showed a minimum plaque and calculus deposits (See Figure 1). However, erythematous marginal gingiva with papillary gingival enlargement in relation to lower anterior teeth was observed. Almost all the tooth exhibited bleeding on slight provocation along with Degree 1 mobility of #16, #21, #26 and #46. A 2mm of midline diastema was also observed in between maxillary central incisors. The upper maxillary labial frenal attachment was gingival. Deep Periodontal pockets range from 5 to 8mm depth along with 2 to 5mm clinical attachment loss, were observed in all four first molars and left

central incisors (See periodontal chart 1). Orthopantomogram revealed an arc shape vertical defects in relation to #16, #21, #26, #35 and #46 (See Figure 2). The complete blood counts, as well as fasting and random blood sugar, were within normal limits. Based on the patient age of presentation, history, clinical and radiographic investigations, a localized aggressive periodontitis was diagnosed.



Figure 1: Preoperative frontal view showing minimal local deposits



Figure 2: Preoperative Orthopantomogram showing angular bony defects

Periodontal Chart 1: Preoperative probing pocket depths

| D M | | | | | | | | | | | | | | M D | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|---|----|---|----|---|----|---|----|---|----|---|----|-----|-----|---|----|---|----|---|----|---|----|---|----|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | 4 | 3 | 5 | 7 | 4 | 8 | 5 | 3 | 4 | 4 | 2 | 3 | 3 | 2 | 4 | 4 | 2 | 5 | 6 | 3 | 5 | 4 | 3 | 4 | 3 | 1 | 4 | 3 | 1 | 3 | 3 | 2 | 5 | 7 | 4 | 6 | 5 | 2 | 4 | B | | |
| P | 3 | 3 | 5 | 6 | 4 | 7 | 5 | 2 | 4 | 3 | 2 | 3 | 3 | 2 | 4 | 3 | 2 | 4 | 3 | 2 | 5 | 6 | 3 | 4 | 3 | 3 | 3 | 1 | 3 | 3 | 2 | 2 | 4 | 2 | 5 | 8 | 4 | 5 | 5 | 3 | 4 | P |
| | 17 | | 16 | | 15 | | 14 | | 13 | | 12 | | 11 | | 21 | | 22 | | 23 | | 24 | | 25 | | 26 | | 27 | | | | | | | | | | | | | | | |
| L | 47 | | 46 | | 45 | | 44 | | 43 | | 42 | | 41 | | 31 | | 32 | | 33 | | 34 | | 35 | | 36 | | 37 | | | | | | | | | | | | | | L | |
| B | 5 | 3 | 5 | 8 | 4 | 6 | 5 | 2 | 4 | 3 | 2 | 3 | 4 | 2 | 5 | 5 | 2 | 4 | 3 | 2 | 4 | 5 | 2 | 4 | 3 | 2 | 4 | 4 | 4 | 7 | 5 | 3 | 5 | 4 | 3 | 4 | 4 | 3 | 4 | B | | |
| P | 4 | 3 | 5 | 7 | 5 | 5 | 5 | 2 | 4 | 4 | 2 | 3 | 5 | 2 | 5 | 5 | 3 | 5 | 6 | 3 | 5 | 5 | 3 | 6 | 5 | 2 | 4 | 4 | 3 | 4 | 5 | 3 | 6 | 5 | 4 | 5 | 5 | 3 | 3 | P | | |
| | D M | | | | | | | | | | | | | | M D | | | | | | | | | | | | | | | | | | | | | | | | | | | |

The treatment began with supragingival ultrasonic scaling. The patient was also informed about the heredity nature of disease so that she would take

proper take care of dentition of her children in future. Besides, proper modified Bass technique of brushing was trained so that she would maintain

meticulous plaque control. After two weeks of the first visit, subgingival scaling and root debridement were done with curette followed by the prescription of antibiotics (amoxicillin 500mg + metronidazole 400mg thrice daily for 8 days, analgesics (Ibuprofen 400mg for a day followed by SOS) and mouthwash (Chlorhexidine 0.2% twice daily for 2 weeks. Supragingival ultrasonic scaling was carried out for further 2 appointments monthly. Re-evaluation of phase I periodontal therapy was done after 3 months of initial scaling. The mandibular anterior gingiva, which was swollen and inflamed in the first visit, was now appeared pink and healthy with negative bleeding on probing (See Figure 3). The periodontal charting also revealed improvement in probing depths (Periodontal Chart 2). Even though, # 16, # 26, # 36, # 35, and # 46 had still persistent pocket measuring more than 5mm. Therefore, modified flap operation (Kirkland flap) was performed as a further management of those teeth. Periodontal flap were reflected from #17, #16, #15, and #14 for treatment of #16. Analgesics and mouth rinse were

again prescribed. Similarly, periodontal flap surgeries were performed for the treatment of # 26, # 36, # 35, and # 46 in separate appointments. After one month of surgery, the interdental brush was advised as there were the openings of gingival embrasures with respect of first molars due to the recession.



Figure 3: Frontal view after Phase I therapy showing establishment of healthy gingiva in relation lower anterior Teeth

Periodontal Chart 2: Pocket depths were reduced to healthy gingival sulcus in lower anterior teeth

| | | D M | | | | | | | | | | | | | | M D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|----|----|
| B | P | 4 | 2 | 5 | 7 | 4 | 6 | 5 | 3 | 4 | 2 | 2 | 3 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 2 | 2 | 4 | 2 | 5 | 6 | 4 | 6 | 5 | 2 | 3 | B | P |
| | | 3 | 2 | 5 | 5 | 4 | 6 | 5 | 2 | 4 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 4 | 3 | 4 | 3 | 2 | 3 | 3 | 1 | 3 | 3 | 2 | 2 | 4 | 2 | 5 | 6 | 4 | 5 | 5 | | |
| L | B | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | L | B | | |
| | | 47 | 46 | 45 | 44 | 43 | 42 | 41 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | | | 68 | 69 |
| | | D M | | | | | | | | | | | | | | M D | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Six months after flap surgery, the periodontal charting was again done (Periodontal Chart 3). None of the periodontal sites revealed a probing pocket depth of 5 or more than 5mm. OPG also revealed a reduction of an angular defect with respect the first molars (Figure 4). As the patient was also concerned about midline diastema in between maxillary central incisors, she was referred to Department of Orthodontics. After orthodontic treatment, the midline diastema was corrected which was very aesthetically pleasant (See Figure 5). The patient was kept on regular follow up.



Figure 5: Frontal view at the time of completion of orthodontic therapy



Figure 4: OPG showing bone fill in relation to first molars

Periodontal Chart 3: Probing pocket depths were within normal limits (<3mm) except in certain sites, where 4mm were observed.

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|-----|----|---|---|----|---|---|----|---|---|----|---|---|----|-----|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|----|---|--|
| | D M | | | | | | | | | | | | | | M D | | | | | | | | | | | | | | | | | | | | | | | | | |
| B P | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | |
| | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 4 | 3 | 1 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 3 | 2 | 3 | 4 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | |
| L B | 17 | 16 | | | 15 | | | 14 | | | 13 | | | 12 | | | 11 | | | 21 | | | 22 | | | 23 | | | 24 | | | 25 | | | 26 | | | 27 | | |
| | 47 | 46 | | | 45 | | | 44 | | | 43 | | | 42 | | | 41 | | | 31 | | | 32 | | | 33 | | | 34 | | | 35 | | | 36 | | | 37 | | |
| B P | 3 | 2 | 3 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 1 | 3 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 1 | 3 | |
| | 3 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 2 | 4 | 3 | 2 | 3 | 2 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | |
| | D M | | | | | | | | | | | | | | M D | | | | | | | | | | | | | | | | | | | | | | | | | |

Discussion

The Localized Aggressive Periodontitis (LAP) is a rare type of periodontal disease, characterized by rapid loss of alveolar bone specifically in the region of the permanent first molars and incisors.³ The Localized Aggressive Periodontitis (LAP) was first described by Gottlieb, in 1923, as a diffuse atrophy of the alveolar bone. The epidemiological data of aggressive periodontitis is less compared to chronic periodontitis and the data available are also related to the previously valid definition of the juvenile or early onset periodontitis. The prevalence of early onset (aggressive) periodontitis in the various race-ethnic groups is 0.1–0.2% in Caucasians, 1.0–3.0% in Africans and African-Americans, 0.5–1.0% in Hispanics and South Americans, and 0.4–1.0% in Asians.⁴ *A. actinomycetemcomitans* is regarded as a key microorganism in LAP based on four lines of evidence.⁵

The periodontal therapy for the aggressive periodontitis comprises: oral hygiene instruction for improving the patient’s plaque control, mechanical removal of dental biofilm by supra- and subgingival scaling and root planing, adjunctive antimicrobial therapy (local and/or systemic), control of local

etiologic factors, occlusal therapy and periodontal surgery – if necessary and periodontal maintenance.⁶ In the present case, antibiotics were prescribed immediately following the subgingival root debridement. The reason behind prescribing the antibiotics was because the periodontal pathogens (e.g. *A. actinomycetemcomitans*, *P. gingivalis* etc) which cause LAP, have the ability to invade and penetrate the periodontal epithelium and connective tissue.⁷ Therefore, to eradicate these tissue bacteria, antibiotics are recommended in an adjunct to mechanical therapy. The combination of metronidazole and amoxicillin were chosen as the antibiotics of choice as this combination had shown a predictable eradication of *A. Actinomycetemcomitans* and marked reduction of *P. gingivalis* in aggressive periodontitis cases.⁸ In the areas of persistent pocket, periodontal surgeries were performed because of several studies^{9,10} that revealed a better elimination of putative periodontal pathogen with access flap surgeries compared to non-surgical therapies only. Although there is an advancement in the regenerative materials, they could not be a suitable alternative for every patient in the treatment of

periodontal bone defects owing to economic factors, ease of availability, as well as religious belief. In the present case too, flap surgery was performed without the use of any bone graft materials or membrane.

Conclusion

Early detection and treatment of the case of localized aggressive periodontitis is the key to achieve the success and to prevent functional and psychological impairment caused by tooth loss.

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References

1. Armitage GC. Development of a Classification System for Periodontal Diseases and Conditions. *Ann Periodontol.* 1999;4(1):1-6. doi:10.1902/annals.1999.4.1.1.
2. Lang N, Bartold PM, Cullinan M, et al. Consensus Report: Aggressive Periodontitis. *Ann Periodontol.* 1999;4(1):53-53. doi:10.1902/annals.1999.4.1.53.
3. Ferreira DAC, Aguiar SMF, Nelson-Filho P, Mussolino De Queiroz A, De Rossi A. Localized aggressive periodontitis – clinical, radiographic, microbiological and immunological findings. *RSBO.* 2014;11(4):393-400. http://univille.edu.br/community/depto_odontologia/VirtualDisk.html?action=readFile&file=v11n4a12.pdf¤t=/ODONTOLOGIA/RSBO/RSBO_v11_n4_outubro-dezembro-2014.
4. Albandar JM, Rams TE. Global epidemiology of periodontal diseases: an overview. *Periodontol 2000.* 2002;29:7-10.
5. Socransky SS, Haffajee AD. The bacterial etiology of destructive periodontal disease: current concepts. *J Periodontol.* 1992;63(4 Suppl):322-331. doi:10.1902/jop.1992.63.4s.322.
6. Parameter on Aggressive Periodontitis. *J Periodontol.* 2000;71(5-s):867-869.
7. Slots J, Research, Science and Therapy Committee. Systemic antibiotics in periodontics. *J Periodontol.* 2004;75(11):1553-1565. doi:10.1902/jop.2004.75.11.1553.
8. Flemmig TF, Milián E, Karch H KB. Differential clinical treatment outcome after systemic metronidazole and amoxicillin in patients harboring *Actinobacillus actinomycetemcomitans* and/or *Porphyromonas gingivalis*. *J Clin Periodontol.* 1998;25(5):380-387.
9. Christersson LA, Slots J, Rosling BG, Genco RJ. Microbiological and clinical effects of surgical treatment of localized juvenile periodontitis. *J Clin Periodontol.* 1985;12(6):465-476.
10. Gunsolley JC, Zambon JJ, Mellott CA, Brooh CN, Kaugars CC. Periodontal Therapy in Young Adults With Severe Generalized Periodontitis. *J Periodontol.* 1994;65(3):268-273. doi:10.1902/jop.1994.65.3.268.