

Rehabilitation and follow up of a Case of Periodontitis - Generalized, Stage IV, Grade B, Progressive, and with no Risk Factors

Abstract

Periodontitis results in loss of periodontal attachment. This case report focuses on diagnosing a special case of periodontitis that required extreme care and maintenance. The peculiarities of this case are that based on 1999 American Academy of Periodontology classification this is a case of generalized aggressive periodontitis, but as per the recent 2017 classification, this is a case of periodontitis – generalized, Stage IV, Grade B, progressive and with no risk factors. Although this case is ideal for surgical management using regenerative techniques, it has been limited to mechanical therapy and laser due to patient-related economical factors. Within the limitations, this case has been successfully managed by dental laser and strategic implants. Despite all the limitations, 1-year follow-up shows periodontal stability and bone regeneration as evidenced through series of panoramic radiographs (OPG).

Keywords: Basal implant, compressive implant, diode laser, periodontitis, recent classification, strategic implant

Introduction

Periodontitis is a host-mediated immune-inflammatory disease affecting the supporting structures of teeth. In the past, attempts to classify periodontitis have tried to answer the dilemma – whether phenotypically different cases like chronic periodontitis and aggressive periodontitis truly represent different diseases or are they just variations of a single disease.^[1] Earlier, by default, cases of periodontitis that would not satisfy the “aggressive” phenotype definition would be classified as “chronic.” There is currently insufficient evidence to consider aggressive and chronic periodontitis as two pathophysiologically distinct diseases. Hence, the recent classification proposed by the World Workshop in Periodontics (WWP) considers both chronic and aggressive periodontitis as a single entity – periodontitis.^[1] This case report is about diagnosing a case of periodontitis based on the recent classification system, and its successful management. The report also focuses on the importance and the need for supportive periodontal care.

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Case Report

A 30-year-old male patient reported to the clinic with the chief complaint of mobility of multiple teeth and bad breath. There was severe halitosis when the intraoral examination was being done. Most of his teeth were covered with calculus; there was pus discharge from several posterior teeth. Spontaneous bleeding on probing was present in multiple sites with generalized probing depth of more than 5 mm. The proper recording of interdental clinical attachment level (CAL) was masked by the presence of heavy calculus, severe inflammation, and gingival overgrowth in several areas. The lower anterior teeth had Grade III mobility and few posteriors had Grade I mobility. The upper incisors were pathologically migrated with wide diastema compromising the esthetics [Figure 1]. No relevant past medical or dental history was given by the patient in spite of repeated inquiries. The case was diagnosed as periodontitis – generalized, Stage IV, Grade B, progressive and with no risk factors.

The blood report was within normal range. Panoramic radiograph (OPG) showed severe generalized horizontal bone loss, with an

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angular pattern of bone loss and furcation involvement in the posteriors. [Figure 2a]. A complete treatment plan was explained to the patient.

Treatment visits: Visit 1: Oral prophylaxis was carried out. Antibiotics (amoxicillin 500 mg TID and metronidazole 400 mg BID for 5 days) and chlorhexidine 0.2% mouthwash were prescribed. The patient was explained about the impacted 38 and 48 and the need for surgical removal. He was also explained about the need to do regenerative periodontal therapy and furcation therapy. Due to financial reasons, he wanted to keep it for another date as his main complaint was halitosis and mobility of anteriors. The patient was recalled two weeks after the completion of scaling and root planing.

Visit 2: Diode laser (iLase – Biolase, 940 nm) was used in pulse mode for a full-mouth laser curettage/LANAP (pulse interval 0.20 ms, power 2.00 W).

Visit 3: Laser-assisted gingivectomy (pulse interval 1 ms, power 0.9 W) in few interdental sites was performed during subsequent visit 2 weeks later [Figure 3]. Amoxicillin 500 mg TID for 5 days and chlorhexidine 0.2% mouthwash were prescribed. Paracetamol 500 mg TID was given for 3 days. The patient was recalled after 14 days.

Visit 4: The patient was happy with the treatment outcomes so far. Teeth 31, 32, 33, 41, 42, and 43 were extracted. As there was cavernous bone loss around the lower anteriors, the prognosis of these teeth were hopeless, and therefore they were extracted. Although there was need for regenerative periodontal therapy at several sites, a compromised treatment plan had to be adopted owing to economic constraints of the patient. The demand and need of was to have a solution for the replacement of anterior teeth with minimal expenses, and it should be least traumatic, flapless, painless, quick to restore, and rehabilitate. Hence, strategic implants (Simpladent, Strategic Implants[®]) were planned for 31, 32, 33, 41, and 42. The patient was recalled after 7 days.

Visit 5: Basal implant was placed in the extraction site in 31, 32, and 41 (3.5 mm × 14 mm) and compressive implant in the fourth quadrant in 42 (4.2 mm × 16 mm) in the same visit. OPG was taken [Figure 2b]. This implant system works on the principle of placing implants at strategic position and loading it before bone remodeling starts, thus completing the case within 72 hours following immediate functional loading protocol.

Visit 6: The prosthetic loading was done within 72 hours [Figure 4a-c]. The patient had previously not consented for extraction of 11 and 21 which were esthetically compromised due to pathologic migration and diastema. It was now noted that after thorough periodontal therapy the diastema had reduced; as appreciated through Figures 1 and 3. The need to do endodontic treatment for



Figure 1: Preoperative photograph

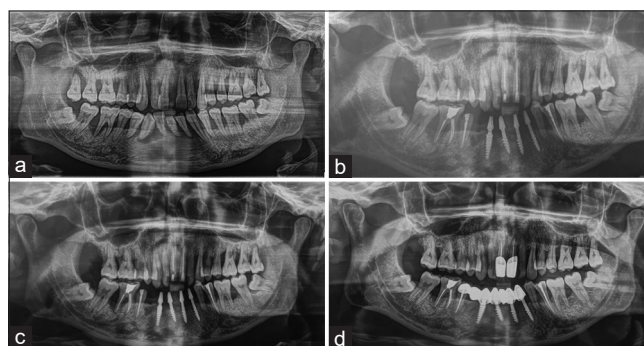


Figure 2: (a) Preoperative OPG, (b) implants placed in lower anterior region and multiple endodontically treated teeth, (c) 6-month follow-up, (d) 1-year follow-up



Figure 3: Laser therapy performed

45, 45, and 46 to improve the periodontal prognosis was explained to the patient.

Visit 7: One month later, endodontic treatment was done for 11 and 21, and also for 35, 45, and 46. Visit 8: The full-mouth prosthetic rehabilitation of upper and lower anteriors was completed in 1 month time [Figure 4c]. The patient was advised home care measures which comprised super soft tooth brush, flouridated regular cream dentifrice, interdental brushes, and oral irrigation to maintain all teeth plaque free. The patient was asked to report 1 month later for review.

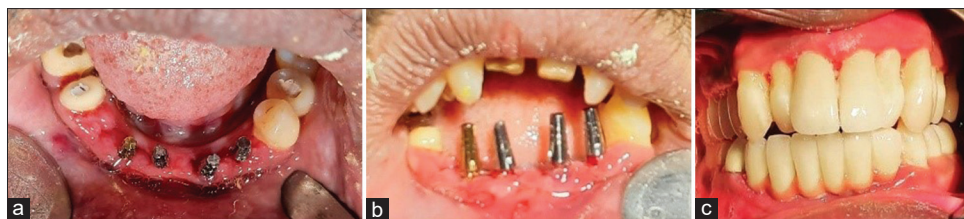


Figure 4: (a) Occlusal view of implants placed, (b) frontal view, (c) prosthetic rehabilitation done

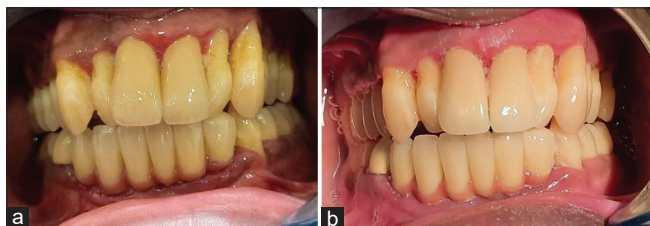


Figure 5: (a) Mild gingival inflammation present in upper anteriors, (b) intraoral view at 1 year follow up visit

Review visit 1: The first review appointment was uneventful. The patient was compliant with all home care measures. There was generalized gingival recession, but the patient was content with the outcome.

Review visit 2: During the second review appointment scheduled 2 months after the first recall visit, there was mild inflammation of upper anteriors and debris [Figure 5a]. Oral prophylaxis was repeated. The patient was asked to report every 2 months in the 1st year.

The patient successfully completed 1-year follow-up [Figure 5b]. OPG was repeated [Figure 2c and d] during review sessions. The OPG showed generalized significant improvement in the bone fill. Thickened crestal lamina dura indicated periodontal stability.

Discussion

Based on the 2017 World Workshop in Periodontics, a patient is a periodontitis case if: interdental CAL is detectable at ≥ 2 nonadjacent teeth, or buccal or oral CAL ≥ 3 mm with pocketing > 3 mm is detectable at ≥ 2 teeth and the observed CAL cannot be ascribed to nonperiodontal causes.^[1] Both chronic and aggressive periodontitis are now considered as a single entity – periodontitis. Staging, an approach used for many years in oncology, has been recently introduced to periodontal disease.^[2] Tables 1 and 2 illustrate the 2017 WWP classification of periodontitis.^[2] Accordingly, complexity factors may shift the stage to a higher level. Periodontitis grade can then be modified by the presence of risk factors. In the present case, 6 teeth with hopeless prognosis due to periodontitis were planned for extraction as a part of periodontal therapy. There was pathologic migration, and flaring of teeth suggestive of Stage IV. And the case phenotype showed destruction quantifying with biofilm deposits (Grade B). So, the case was suggestive of periodontitis – generalized, Stage IV, Grade B, progressive with no risk factors.

The patient's refusal to undergo surgical regenerative procedures due to financial constraints limited our treatment strategy. Hence, thorough scaling and root planing was carried out along with LASER-assisted management of soft tissues. Nonsurgical periodontal therapy (NSPT) is the cornerstone of periodontal therapy and the first recommended approach to the control of periodontal infections.^[3] It is still considered to be the “gold standard” to which other treatment methods are compared. However, conventional mechanical debridement procedures do not remove all periodontopathic bacteria from the subgingival environment, like those in inaccessible areas such as furcations and deep pockets. Recent advances in NSPT include the application of lasers, photodynamic therapy, and hyperbaric oxygen therapy. Although there is no clear evidence to date that laser applications improve clinical outcome due to the action of curettage, laser treatment has a potential advantage of accomplishing soft-tissue wall treatment effectively along with root surface debridement,^[4-6] and this was noted in our patient too.

Endodontic treatment has been found to improve periodontal outcomes in endo-perio lesions.^[7,8] Endodontic treatment was performed on few teeth and there was improvement in the periodontal prognosis within few months. The next challenge was replacement of teeth with hopeless prognosis. The patient's demand was to have a quick solution for the replacement of lost teeth with minimal expenses in a least traumatic manner. The time constraint limited conventional 2-stage implant therapy, thereby opting strategic implant placement. Following the concept of strategic implantology, basal and compressive implants were placed flapless, minimizing regional acceleratory phenomenon and was relatively atraumatic to the patient. Body of this implant is strong enough to sustain occlusal loading.^[9] It is bendable in order to bring the abutment to a desired prosthetic plane after engaging the buttress. Force transmission at apical threads engaged at the intended cortices and buttress, minimizes the effects of the unstable crestal cortical bone, which further helps the prosthetic loading within 72 hours.

Immediate/early implant loading procedures are well documented.^[9,10] Strategic implantology[®] is a long-proven and simplified technology for rehabilitation of stomatognathic complex following immediate functional loading protocols. The concept is based on the principles of traumatology and orthopedics. With

Table 1: Periodontitis staging for diagnosis^[2]

Periodontitis stage	Stage I	Stage II	Stage III	Stage IV
Severity				
Interdental clinical attachment loss at the site of greatest bone loss(mm)	1-2	3-4	≥5	≥5
Radiographic bone loss	Coronal third (<15%)	Coronal third (15%-33%)	Extending to the middle third of root and beyond	
Tooth loss	No tooth loss due to periodontitis		Tooth loss due to periodontitis ≥4	Tooth loss due to periodontitis ≥5
Complexity				
Local	Maximum probing depth ≤4 mm	Maximum probing depth ≤5 mm	<i>In addition to stage II complexity:</i> Probing depth ≥6 mm	<i>In addition to stage III complexity:</i> Need for complex rehabilitation due to: Masticatory dysfunction
	Mostly horizontal bone loss	Mostly horizontal bone loss	Vertical bone loss ≥3 mm	Secondary occlusal trauma (tooth mobility degree ≥2)
			Furcation involvement	Severe ridge defect
			Class II or III	Bite collapse, drifting, flaring <20 remaining teeth (10 opposing pairs)
			Moderate ridge defect	
Extent and distribution	Add to stage as descriptor For each stage, describe extent as localized (<30% of teeth involved), generalized or molar/incisor pattern			

Table 2: Periodontitis grade^[2]

Periodontitis grade (rate of progression)	Slow rate	Moderate rate	Rapid rate
Primary criteria			
<i>Direct evidence of progression</i>			
Longitudinal data (radiographic bone loss or CAL)	Evidence of no loss over 5 years	<2 mm over 5 years	≥2 mm over 5 years
<i>Indirect evidence of progression</i>			
Percentage bone loss/age	<0.25	0.25-1.0	>1.0
Case phenotype	Heavy biofilm deposits with low levels of destruction	Destruction commensurate with biofilm deposits	Destruction exceeds expectation given biofilm deposits; specific clinical patterns suggestive of periods of rapid progression and/or early onset disease (e.g., molar/incisor pattern; lack of expected response to standard bacterial control therapies)
Grade modifiers			
Risk factors			
Smoking	Nonsmoker	Smoker <10 cigarettes per day	Smoker >10 cigarettes per day
Diabetes mellitus	Normoglycemic/no diagnosis of diabetes	HbA1c <7.0% in patients with diabetes	HbA1c ≥7.0% in patients with diabetes

HbA1c: Hemoglobin A1c; CAL: Clinical attachment level

conventional endosseous dental implants, the occurrence of “peri-implantitis” decreases the patient’s quality of life. While the strategic implant technology does not lead to “peri-implantitis” as it not dependent on the unstable crestal cortical bone; it works in an immediate load protocol and creates multicortical anchorage. There is virtually no contraindication for the restoration by strategic implant® other than the patient on intravenous bisphosphonates.

The biggest challenge in this patient case is the lifelong supportive periodontal therapy protocol that the patient has to comply to. Successful outcomes are best obtained when the patient has a diligent attitude towards recall visits and is compliant with all oral home care measures. The goal

of supportive periodontal therapy is to sustain the results obtained such as pocket depth reduction and clinical attachment gain in maintenance patients.

To summarize, even though there is no single periodontal therapeutic regimen that will provide a beneficial response for all patients, NSPT still constitutes the first step in effectively controlling periodontal infections. Adjunctive therapies used in combination with conventional mechanical treatment have the potential to improve the condition of the periodontal pockets. Changing concepts in periodontal microbiology might modify our approach to mechanical therapy, and technologic advances might help us to perform the treatment more effectively and easily in future.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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