

Rehabilitative Management Offered Nigerian Localized and Generalized Aggressive Periodontitis Patients

Oyekunle Oluwole Dosumu, BDS, FMCDS, FWACS;
Elizabeth Bosede Dosumu, BDS, FMCDS;
Modupeola Olayinka Arowojolu, BDS, FWACS;
Sunday Samson Babalola, PhD



Abstract

This paper highlights the typical clinical features of aggressive periodontitis (formerly known as juvenile periodontitis in the South Western region of Nigeria), the attending psychological effect following tooth loss, and the rehabilitative management offered which included periodontal therapy, psychotherapy, and prosthetic replacement of the missing teeth. The psychotherapy is the main distinguishing treatment in this study from previously reported modes of management of this disease entity.

Subjects were from a part of the South Western region of Nigeria, and ages ranged from 15 to 22 years. They all presented very late with subsequent gross periodontal breakdown and subsequent psychological depression. The mean values of the probing depth (mm), degree of mobility, and the amount of bone fill (mm) from the periapical radiographs were recorded pre and post-operatively. The missing teeth were replaced with acrylic dentures, and psychotherapy was offered at three levels (individual, group, and conjoint-family psychotherapy).

There was significant improvement of these clinical parameters six months after treatment, and the partial denture replacement of the missing teeth improved their appearance as expected but did not totally improve the initial depressive state. The psychotherapy offered gave the patients positive psychological effects that further restored their ability to socialize in their environment, which added to their positive experience of life.

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In conclusion the typical clinical features of localized aggressive periodontitis (LAP) and generalized aggressive periodontitis (GAP) patients in our environment are late presentation with gross periodontal tissue breakdown. Psychotherapy is an important aspect in the management of this group of patients in conjunction with the periodontal and prosthetic management, which gives total rehabilitation.

Keywords: Rehabilitation, aggressive periodontitis, juvenile periodontitis, dentures, psychotherapy

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Introduction

“Localized and generalized aggressive periodontitis” (LAP and GAP) were previously referred to as “localized and generalized juvenile periodontitis” until recently when this terminology was discarded by participants of the international workshop for a classification of periodontal diseases and conditions.¹ This discards classification terminologies that were age-dependent or required knowledge of rates of progression.¹

This form of periodontitis has been defined as the disease of the periodontium occurring in an otherwise healthy adolescent.² The amount of destruction is not commensurate with the amount of local irritants. It has been reported as one of the more debilitating periodontal diseases having a circum-pubertal age of onset.³ It is classified as both a localized and a generalized form. It was previously regarded as a rare disease, but in recent times it has also been found to be more common in occurrence. This form of aggressive periodontitis has come into the forefront as a model for the study of inflammatory periodontal disease.^{4,5} It is characterized by a rapid loss of alveolar bone around more than one tooth of the permanent dentition, resulting in the eventual loss of these teeth if left untreated or if it is diagnosed too late to save them. After the etiologic importance of *Actinobacillus actinomycetemcomitans* (Aa) was recognized, the periodontal treatment of juvenile periodontitis was directed towards the elimination of Aa in subgingival sites and corrections of the soft tissue and osseous lesions produced by the disease.⁶ Accordingly, a number of different modalities have been used in the treatment of this form of aggressive periodontitis, most of which result in at least initial clinical improvement. Lesions caused by this form of



aggressive periodontitis have a tendency to recur so successful treatment is highly dependent on long-term follow-up.⁷

Natural teeth and their supporting bone make an important contribution to the contour of the face, and loss of teeth is directly or indirectly linked to health beliefs, attitude, and behaviour. After tooth loss some changes in facial appearance, resulting in a typical appearance of premature aging, are inevitable. The apparent premature aging may cause these adolescent patients to be psychologically depressed and withdrawn from society. The provision of a removable acrylic partial denture is considered here as one simple affordable treatment option for these partially dentate subjects. An over-denture is another simple option, which may be better than the removable acrylic partial denture, considering its advantages such as preservation of alveolar bone, proprioceptive response, retention, support, convertibility, and patient's acceptance. Although implants and fixed prosthesis are excellent treatment options, they are not simple and they are costly.

Psychological depression can be managed by psychotherapy (individual, group, and conjoint-family) and chemotherapeutically (i.e., “the medical model”).⁸ The use of psychotherapy is based

on the principle people will only change their behaviour if they perceive the new behaviour change as potentially effective, beneficial, and practically feasible.⁹ Becker and Maiman¹⁰ reported people are prepared to change their behaviour in various ways when they believe their behaviour is beneficial and if they know they have social support from friends and community. Psychotherapy at these three levels combined gives optimum positive rehabilitative effect.^{8,11}

The objective of this study was to point out the importance of early patient presentation, correct diagnosis, and proper management (especially the inclusion of psychotherapy) of the disease condition by the dentist.

Materials and Methods

The study was carried out in the Prosthetic and Periodontology units of the Dental Centre, University College Hospital, Ibadan and Psychology department of the University of Ibadan, Ibadan, Nigeria. The mode of treatment in this study is different from the previously documented ones by the inclusion of psychotherapy that resulted into complete rehabilitation of the patients.

Four subjects were recruited for the study after they had been subjected to a full diagnostic work-up at the Periodontology unit. The work-up included a thorough medical history; a full mouth clinical examination with complete preoperative charting of periodontal pocket probing depth using "Ash" calibrated periodontal probes as well as degree of tooth mobility using the Miller mobility index¹²; full mouth preoperative periapical radiographs; and clinical photographs. The selection criteria included general good health, no use of systemic antibiotics in the preceding six months, not pregnant, no systemic considerations that would alter disease progression or the result of therapy, and the presence of at least four pairs of teeth with an interproximal intrabony defect.

Informed consents were obtained from the subjects after the nature of the treatment procedures and possible discomforts and risks had been explained fully. Ethical clearance was also obtained from the University College Hospital/College of Medicine Ethical Committee.

Clinical Technique

Following inclusion into the study, initial scaling and polishing was done on all the patients' teeth, and they were then placed on a two week course of systemic Tetracycline capsules 250 mg 6 hourly after this initial scaling and polishing.

The patients were instructed in proper oral hygiene techniques, and subsequent periodontal therapies were commenced a week after the initial treatment. Choice of surgical and non-surgical therapy was based on the depth of the periodontal pathologic pocket (PPP). PPP less than or equal to 5 mm received deep gingival curettage and root planning (non-surgical therapy), while PPP greater than or equal to 6 mm received the open flap gingival curettage (surgical therapy). As recommended by Devore et al.¹³ and Machtei et al.¹⁴, teeth that were assessed to be "hopeless" were extracted at the time of commencement of the periodontal therapies due to the possible destructive influence on the proximal periodontium of adjacent teeth.

Clinical Measurement

Subjects were given monthly recall visits for six months; post-operative radiographs were taken for all subjects at the end of six months. The following clinical measurements were taken post-operatively:

- A. Probing depths of defect sites measured to the nearest millimeter (mm)
- B. Degree of tooth mobility using the Miller mobility index¹²
- C. Bone regeneration of defect sites were measured in mm from the pre- and post-operative radiographs using a grid made with galvanized aluminium netting of 1 mm spacing placed at a standard position over the radiographs. The radiographic parameters measured were those used by Novak et al. to assess defect sites.¹⁵

Rehabilitative Management

Dental rehabilitation included prosthetic replacement of missing teeth and psychotherapy. Although overdentures provide a sound prosthetic rehabilitation by enhancement of patient acceptance of the partial denture, these patients could not be given this treatment option because



of the periodontal status of their teeth at the time of presentation. The patients presented very late with tilted and pathologically migrated teeth that could not be used for an overdenture. In addition they could not afford the cost of periodontal and endodontic therapy for teeth that might have to be used for overdenture abutments. As a result, mucosa-borne acrylic based partial dentures were fabricated for the patients three months after clinical therapy to replace any missing teeth. These dentures had to be mucosa-borne because the abutment teeth were periodontally compromised and could not be used to support the dentures. Acrylic based dentures provide the opportunity to expand the existing denture if needed in the future and they are suitable in situations when there is marked bone loss as in these cases. Partial dentures were fabricated so they did not encroach on the gingival margins of the teeth. This was to allow effective cleansing and preventing food stagnation at these interfaces. Stainless steel wrought wire clasps (0.7 gauge) were placed on the dentures where necessary to improve retention.

The psychotherapy offered was at three levels: individual, group, and conjoint-family psychotherapy.^{8,11} During individual psychotherapy the subjects were seen on a one-on-one basis. Dentists identified with the patients' condition, to engage the patients and to establish motivation at the first visit, in order to assist patients to understand the ramifications of their disease and its prognosis. This was also done to help them find themselves, minimize their periodontal defects, and to improve their quality of life.^{8,11}

In the group psychotherapy the patients were made to meet each other and discuss their problems. The goal was to encourage the patient

by showing they are not the only individual with this disease condition. The aim of this group psychotherapy is to bring about changes in behaviour and personality, which facilitates their rehabilitation back into the community. It has been suggested changes brought about by treatment in a group situation are longer lasting than those produced by other methods.^{8,11}



The conjoint-family psychotherapy was employed on the basis of the observation that, although the patient has been identified, she/he may in fact only be one member in a family with aggressive periodontitis. The goal of such therapy is by helping the family to have the knowledge of this disease, the patient is supported by his/her family in the course of the management.^{8,11}

Statistical Analysis

All analysis was performed on a microcomputer using the Stapac Gold statistical analysis package. The means and standard deviations of each clinical parameter were determined for all the teeth involved both pre-operatively and six months post-operatively for each subject. Independent t-test was used to determine the level of significance between the means of each clinical parameter pre- and post-operatively.

Case Summary #1

A 15-year old female private secondary school student and her mother presented in the Dental Centre. The patient complained of “shaking” (loose) and irregularly arranged teeth in the past one year. The teeth were not painful, but the patient and the mother were concerned about the un-aesthetic appearance of the irregularly arranged teeth and the fear the loose teeth might eventually be lost (Figure 1).

This was the patient’s first visit to the dentist, and the mother claimed the patient’s maternal grandmother also lost her teeth at a very early age. Past medical history revealed no underlying systemic disease, and the patient was not on any routine medication at the time of presentation.

Intral-oral examination revealed a fair oral hygiene, complete dentition (except unerupted 3rd molars), supra-erupted maxillary and mandibular anterior teeth (incisors and canines) with gingival recession, mobility of the incisors and the first molars, periodontal pocketing of the

mobile teeth (5-10 mm), and alveolar bone loss (30-80%) in relation to the mobile teeth observed from the periapical radiographs. (Figure 2)

The patient was managed clinically for six months during which time she adhered strictly to the management instructions including the recall

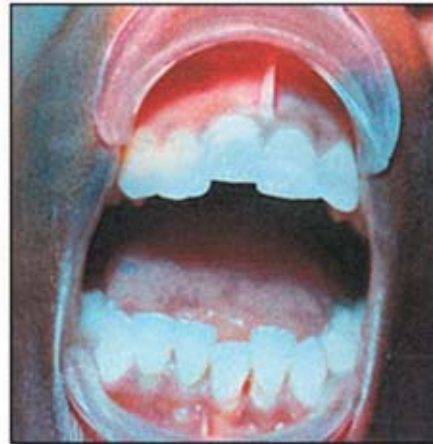


Figure 1. A 15-year old female with loose and crowded anterior teeth.

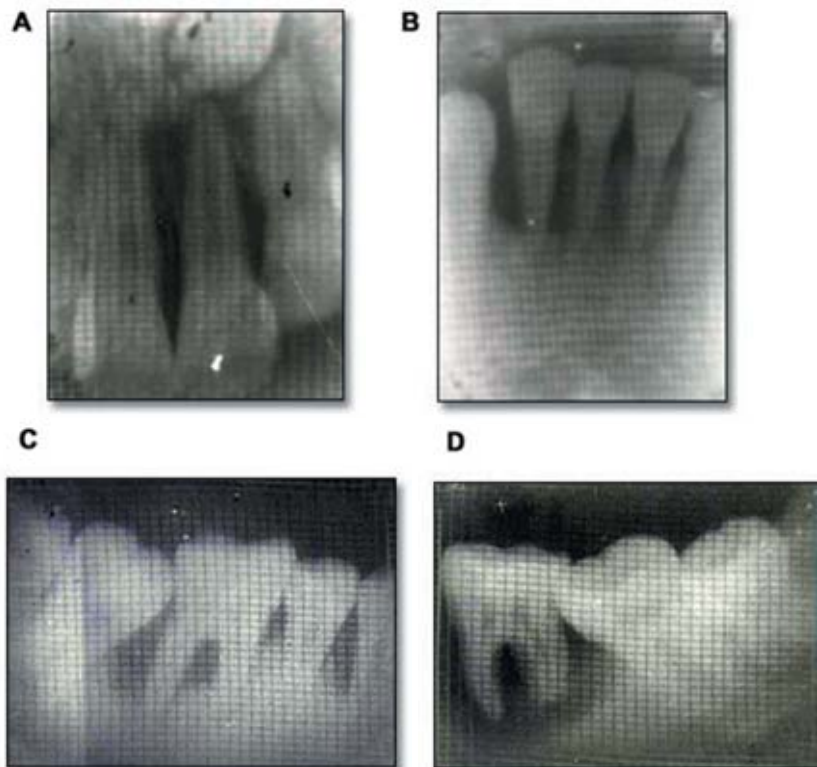


Figure 2A. Preoperative radiographs showing alveolar bone loss. **A.** Maxillary incisors. **B.** Mandibular incisors. **C.** Mandibular right posterior teeth. **D.** Mandibular left posterior teeth.

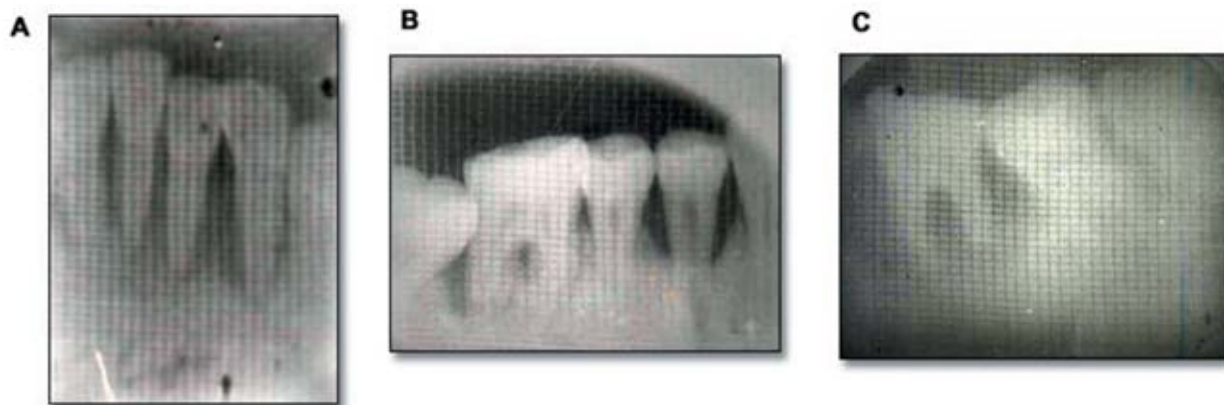


Figure 2B. Postoperative periapical radiographs of teeth with alveolar bone loss. **A.** Mandibular anteriors. **B.** Mandibular right posterior teeth. **C.** Mandibular left posterior teeth.

visits and clinical measurements were made (as indicated in the Materials and Methods section of this study). Open flap gingival curettage was done on teeth with ppp ≥ 6 mm and deep gingival curettage and root planning done on teeth with ppp ≤ 5 mm. None of this patient's teeth were extracted and so she did not need any denture prosthesis. During this six months group psychotherapy was done with other LAP and GAP patients, while individual and conjoint-family psychotherapy was done throughout the study period with the dentist and the patient's mother, respectively. The patient was recalled monthly for review and maintenance therapy during which time the importance of oral hygiene measures were stressed and scaling was done. At the six months recall visit, the ppp depth, degree of teeth mobility, and bone fill were measured. It was observed the ppp depth had reduced (2-5 mm), mobility (0-1°), and average of about 50% bone fill achieved.

Case Summary #2

A 16-year old male public secondary school student presented in the clinic with loose and drifting teeth resulting in spacing between the drifted maxillary and mandibular teeth. The patient claimed this condition prevented him from speaking in public as he considered it to be embarrassing. This was the patient's first visit to the dentist and stated his mother also lost some of her teeth at an early age. (Figure 3)

Past medical history revealed no underlying systemic disease, and he was not on any routine medication at the time of presentation. Intra-oral examination revealed a fair oral hygiene,



Figure 3. A 22-year old female with loose and drifted teeth.

complete dentition (32 erupted teeth), distally drifted maxillary and mandibular central incisors, mobility of the incisors, and the first molars. Deep periodontal pathologic pocketing (4-6 mm) of these mobile teeth and alveolar bone loss (40-70%) in relation to the teeth were observed from the periapical radiographs.

The patient was managed clinically for six months during which time he adhered to the instructions. Deep gingival curettage and root planning were the only periodontal therapies done on this patient because the deepest periodontal pocket was 6 mm. Patient was recalled monthly during which he had oral hygiene instructions and motivations given and scaling of the teeth done. Clinical measurements were done as indicated in the Materials and Methods section of this study. A lower acrylic partial denture bearing lower central incisors was constructed for the patient after 3 months to fill the lower anterior pathological diastema. Patient was encouraged to accept the upper anterior pathological diastema as a natural occurrence. Group psychotherapy was

done at sometime in the study with other LAP and GAP patients, while conjoint-family psychotherapy was done with the mother and the individual psychotherapy done throughout the period of the study. At the six month recall visit, the ppp depth, degree of teeth mobility, and bone fill were measured. It was observed the ppp depth had reduced (2-4 mm), the degree of teeth mobility (0-1°), and an average of 50% bone fill achieved.

Case Summary #3

A 22-year old female seamstress presented with a 6-year history of loose and drifted teeth with eventual loss of some of these teeth. She claimed this made her look old and was disturbing her performance as a member of the choir and in attracting a spouse. This was the patient's first dental visit. She stated her mother had lost most of her teeth at a very early age (Figure 4).



Figure 4A. A 22 year old female with loose and drifted teeth.



Figure 4B. Periapical radiograph of the right mandibular molars.

Past medical history revealed no underlying systemic disease and patient was not on any routine medication at the time of presentation. Intra-oral examination revealed fair oral hygiene, partial edentulousness of both arches, pathologically migrated teeth, mobility of all existing teeth except the third molars. Findings also included deep periodontal

pathologic pocketing and gross alveolar bone loss (40-80%) associated with mobile teeth (5-8 mm), as observed from the periapical radiographs. The lower left first molar, upper left lateral incisor, and upper right central incisors were deemed hopeless. (Figure 4B)

The patient was managed clinically for six months during which time she adhered to the instructions and clinical measurements taken (as indicated in the Materials and Methods section of this study). The ppp in this case was just in the range of 5-8 mm because of gingival recession and the drifting of the teeth involved. Teeth with ppp \geq 6 mm had open flap gingival curettage, while ppp \leq 6 mm had deep gingival curettage and root planning done. The hopeless teeth as shown in Figure 4B were extracted during the periodontal therapy. The missing teeth were replaced with maxillary and mandibular acrylic partial dentures three months after periodontal therapy and extractions to allow healing. In addition group psychotherapy was done with other subjects, conjoint-family psychotherapy with the patient's elder sister, and individual psychotherapy was maintained through out the study especially to enhance her acceptance of the prosthesis. This patient was recalled monthly for review and maintenance therapy (oral hygiene instructions and motivations) done. At the six months recall visit, the ppp depth, degree of teeth mobility, and bone fill were observed to improve (ppp 2-5 mm, degree of teeth mobility 1°-2°, and about 45% bone fill).

Case Summary #4

A 20-year old female federal polytechnic student presented with loose teeth and requested a denture to replace recently extracted teeth. The patient could not go back to school following the loss of the teeth for fear of being humiliated. (Figure 5)

This was the patient's third visit to the dentist. The first two were at the government dental centre where nine of the lower teeth that were mobile were extracted. There was history of patient's maternal grandmother losing most of her teeth at a very early age.

The past medical history revealed no underlying systemic disease and patient was not on any routine medication at the time of



Figure 5. Intraoral photograph of Case #4.

presentation. Intra-oral examination revealed fair oral hygiene, partial edentulousness, mobility of the existing teeth (1° - 2°) deep periodontal pathologic pocketing of the mobile teeth (5-7 mm), drifting teeth, and gross alveolar bone loss (40-60%) in relation to the mobile teeth as observed from the periapical radiographs.

The patient was managed clinically for six months during which time she adhered to the instructions, and clinical measurements were taken as indicated in the Materials and Methods section of this study. PPP depth ≥ 6 mm received open flap gingival curettage, while ppp depth ≤ 6 mm received deep gingival curettage and root planning. No other teeth were extracted apart from those previously extracted at the government dental centre.

The group psychotherapy was done with other subjects at sometime during the study, while conjoint-family psychotherapy was done with the parents of the patient. The individual psychotherapy was done throughout the study with authors. Maxillary and mandibular acrylic

partial dentures were fabricated and inserted to replace the missing teeth two months into the study since she had the extractions done before she presented and the extraction sockets were already healing. The three levels of psychotherapy enhanced her acceptance of the prosthesis. At the six month recall appointment, clinical measurements done showed ppp depth reduction (2-5 mm), degree of teeth mobility reduction (0 - 1°), and bone fill (50%).

Results

Tables 1-4 show the changes in the clinical parameters of the cases at the pre- and post-operative periods. They were all observed to show significant improvement ($p < 0.05$).

Discussion

Nigeria is a developing country in West Africa having a population of about 120 million people with a total land area of 923,968 km.² Almost one-half of the population is under 15 years of age, with only a small percentage of the total population being 65 years and above.¹⁵ There is a preponderance of young persons in the population, and the burden of childhood dependency is high.



Table 1. Case Summary #1.

Clinical Parameters	Pre-operative	Post-operative	P-value	Level of Significance
Mean Probing Depth (mm)	6.333 \pm 1.414	2.25 \pm 0.354	0.0029	Significant
Mean Mobility Index	2.0 \pm 0.471	0.5 \pm 0.707	0.0048	Significant
Mean Bone Defect (mm)	20.779 \pm 1.955	10.001 \pm 1.905	0.0022	Significant

Table 2. Case Summary #2.

Clinical Parameters	Pre-operative	Post-operative	P-value	Level of Significance
Mean Probing Depth (mm)	4.5 \pm 0	2.5 \pm 0	0.0414	Significant
Mean Mobility Index	1.5 \pm 0	0	0.0559 (< 0.0550)	Significant
Mean Bone Defect (mm)	20.351 \pm 3.051	10.001 \pm 1.905	0.0048	Significant

Table 3. Case Summary #3.

Clinical Parameters	Pre-operative	Post-operative	P-value	Level of Significance
Mean Probing Depth (mm)	5.17 ± 0.233	2.75 ± 0.354	0.0414	Significant
Mean Mobility Index	2.5 ± 0.354	1.0 ± 0.707	0.0614	Significant
Mean Bone Defect (mm)	21.708 ± 1.9913.333	13.333 ± 2.0	0.0059	Significant

Table 4. Case Summary #4.

Clinical Parameters	Pre-operative	Post-operative	P-value	Level of Significance
Mean probing depth (mm)	6.0 ± 0.0	3.333 ± 0	0.0414	Significant
Mean Mobility Index	2.133 ± 0	0.667 ± 0	0.0038	Significant
Mean Bone Defect (mm)	20.175 ± 1.88	10.501 ± 1.85	0.0048	Significant

There are four established dental schools in Nigeria (all in the South Western zone) with an average annual graduate intake of about 150 dentists. To date, there are just about 3,000 dentists in the country with about 6 Prosthodontists and 10 Periodontologists. The prosthodontic and periodontology teaching curricula in the four dental schools have been fashioned after the British model and are, therefore, very similar with different contact-time allocation.

In the early and late 1970s undergraduate prosthetic and periodontology training in Nigeria involved a concentrated course of lectures with some practical demonstrations. The post-graduate training program is conducted by two post-graduate colleges: National Postgraduate Medical College of Nigeria (NPMACN) and the West African Post-graduate Medical College (WAPMC).

Naturally, one would expect those in need of specialist care for the replacement of missing teeth and periodontal treatment should have the care, but unfortunately not many have access to such care. This is due partly to the fact specialist prosthetic and periodontal care awareness is very low among the patients. There is a very low ratio of prosthodontists and periodontologists to the overall population. This may explain why the patients in these case reports presented very late and the possibility of the dental general practitioner arriving at a wrong diagnosis, which led to the extraction of all the mobile teeth in case summary 4.

Several authors have reported the treatment of LAP and GAP is unsuccessful if Aa is not eliminated from the pockets, while surgical and non-surgical treatment modalities in conjunction with systemic tetracycline administration have been reported to be effective and prognosis reported to be good.^{7, 17, 18}

In this study all the subjects received either the surgical or non-surgical treatment modality or both depending on the depth of the periodontal pathologic pocket. All were given systemic Tetracycline capsules (250 mg qid for two weeks). We found the clinical parameters to improve significantly after six months when compared with the baseline measurements.

Clinical studies have shown an increase in gingival inflammation and/or plaque accumulation in patients fitted with removable partial dentures.¹⁹⁻²⁴ A critical feature of removable appliances is the relationship of the acrylic denture base to the gingival margin. Bissada et al.¹⁷ showed the degree of gingival changes may vary according to the denture gingival relationship and also to the type of denture base materials. They observed the most severe pathological gingival changes were in areas where the denture base covered the gingival margins. From a review of articles in this field^{19, 20, 23, 24}, it is evident acrylic removable appliances evoke a worse gingival response than do metallic dentures.

The subjects in this study that required replacement of missing teeth were given acrylic base partial dentures because they could not

afford the high cost of the cobalt-chromium partial dentures, fixed prosthesis, or implants even though they are better options. In order to facilitate the maintenance of a healthy periodontal status the acrylic denture were fabricated so that they did not encroach on periodontally involved teeth or gingival margins. This relief incorporated into the denture designs provided for effective cleaning and prevented food stagnation and plaque accumulation. To further enhance maintenance of healthy periodontal status, patients were instructed in the proper and regular oral hygiene measures and daily cleaning of the appliance before and after each meal.

The subjects were observed to be depressed and withdrawn from their society; hence psychotherapy was employed at three levels: individual, group, and conjoint-family psychotherapy. In all four cases the subjects and their parents/guardian were educated on the disease conditions and the importance of the strict follow-up management. The conjoint-family psychotherapy helped the patients and the family to accept the clinical condition as a natural occurrence that could be managed medically, if the patient maintained recall appointments. The individual psychotherapy improved patients' acceptance of the removable partial denture as an acceptable alternative to their missing teeth. This improves the patient's ability to interact within society by not feeling "abnormal"

because they were missing teeth. Upon completion of therapy, the patients in case summaries 3 and 4 that were obviously withdrawn from their environment were rehabilitated. The patient in case 3 rejoined the church choir and got a spouse, while the patient in case 4 returned to school in a happier state of mind.

Conclusion

The following are recommendations as a result of this study.

1. Continuing dental education lectures for dental practitioners at regular intervals
2. School dental health education
3. Improvement of available facilities
4. Subsidizing the charges for periodontal and prosthetic treatments
5. Improved public enlightenment on periodontal conditions

This study has demonstrated patients in this area of the world have very little access to comprehensive dental care. As a result, patients can present with untreated, severe aggressive periodontitis. Rehabilitation of these patients may require periodontal therapy, prosthodontic rehabilitation, and psychotherapy. These cases are unique for incorporating individual, group, and conjoint-family counselling in conjunction with dental care.

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About the Authors

Oyekunle Oluwole Dosumu, BDS, FMCDS, FWACS

Dr. Dosumu received his degree from the College of Medicine at the University of Ibadan, in Ibadan, Nigeria and completed a Fellowship of the National Post-graduate Medical College (FMCDS) in prosthodontics and a Fellowship of the West African College of Surgeons (FWACS) in prosthodontics. Dr. Dosumu presently serves as a Senior Lecturer/Honorary Consultant at the University College Hospital in Ibadan, Nigeria.

e-mail: smiledental_clinic@yahoo.com

Elizabeth Bosede Dosumu, BDS, FMCDS

Dr. Dosumu received her degree from the College of Medicine at the University of Ibadan, in Ibadan, Nigeria and completed a Fellowship of the National Post-graduate Medical College (FMCDS) in periodontics. Dr. Dosumu presently serves as a Lecturer/Honorary Consultant at the University College Hospital in Ibadan, Nigeria.

Modupeola Olayinka Arowojolu, BDS, FWACS

Dr. Arowojolu received her dental degree from the College of Medicine, University of Ibadan, Nigeria and completed a Fellowship of the West African College of Surgeons in 1993. She is an Associate Professor of Periodontology and an honorary Consultant Periodontist at the University College Hospital, Ibadan, Nigeria.

Sunday Samson Babalola, PhD

Dr. Babalola received his Bachelor of Science degree in 1986 from University of Nigeria, in Nsukka, Nigeria and received both his MSc degree in Organisational Psychology and Doctorate degree in Psychology from University of Ibadan, Nigeria. He currently serves as a Lecturer in the Department of Psychology at the University of Ibadan, Nigeria.