

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/273147144>

Prosthodontic rehabilitation of a patient with aggressive periodontitis

Article in *BMJ Case Reports* · March 2015

DOI: 10.1136/bcr-2014-204588 · Source: PubMed

CITATIONS

3

READS

869

4 authors, including:



David Livingstone

Indira Gandhi Institute of Dental Sciences

14 PUBLICATIONS 35 CITATIONS

[SEE PROFILE](#)



Varsha Murthy

Sri Venkateshwaraa Dental College, Pondicherry

33 PUBLICATIONS 74 CITATIONS

[SEE PROFILE](#)



Ajay Pillai

Peoples University

31 PUBLICATIONS 116 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



Communication skills [View project](#)



Intellectual Property Rights [View project](#)

CASE REPORT

Prosthodontic rehabilitation of a patient with aggressive periodontitis

David Livingstone,¹ Varsha Murthy,¹ Vineela Katam Reddy,² Ajay Pillai³

¹Department of Prosthodontics, Indira Gandhi Institute of Dental Science, Pondicherry, India

²Department of Periodontology, Indira Gandhi Institute of Dental Science, Pondicherry, India

³Department of Oral & Maxillofacial Surgery, People's Dental Academy, Bhopal, Madhya Pradesh, India

Correspondence to

Dr Ajay Pillai,
drajaypillai@yahoo.co.in

Accepted 19 February 2015

SUMMARY

Aggressive periodontitis previously termed as juvenile periodontitis is characterised by rapid destruction of the periodontium at a relatively young age. Rehabilitation of these patients is often challenging and difficult. Controlling the disease and restoring periodontal health is essential for successful prosthodontic rehabilitation. This clinical report describes an interdisciplinary approach in the rehabilitation of a young adult patient with generalised aggressive periodontitis. Treatment objectives included plaque control, prevention of further attachment loss, reduction/elimination of pockets, and prosthetic rehabilitation to enhance aesthetics and restore masticatory function. One year recall evaluation revealed stable periodontal support with no further loss of attachment and no other complications.

BACKGROUND

The loss of periodontal support that occurs in generalised aggressive periodontitis leaves the clinician challenged with uncertainty about treatment outcomes and difficulty in making decisions. Generalised aggressive periodontitis affects systemically healthy individuals under 30 years of age, although patients may be older. The disease is characterised by rapid rate of progression, strikingly peculiar subgingival microflora, altered host immune response and a familial aggregation of diseased individuals. The destruction of periodontium appears to occur episodically with periods of advanced destruction followed by quiescence of variable length (weeks to months or years). These patients often have small amounts of bacterial plaque associated with the affected teeth. Qualitatively, *Porphyromonas gingivalis*, *Actinobacillus actinomycetemcomitans* and *Tannerella forsythia* (formerly *Bacteroides forsythus*) are detected in the plaque that is present.

The gingival tissue response may be inflamed or appear pink and free of inflammation. During the acute phase, the gingiva appears inflamed, proliferating, ulcerated and fiery red, with bleeding and suppuration. Bone and attachment are actively lost during this destructive phase. In other cases, the gingiva appears normal and free of inflammation despite the presence of deep pockets. This kind of tissue response coincides with periods of quiescence in which bone levels remain stationary. Cases of generalised aggressive periodontitis may be arrested spontaneously or may continue to progress to tooth loss despite treatment. Defects in polymorphonuclear leucocyte (neutrophil) function have been identified in some patients with



Figure 1 Preoperative clinical picture, anterior view.

aggressive periodontitis. In a small number of patients, neutropaenia can be identified.^{1 2}

Rehabilitation of a patient with generalised aggressive periodontitis involves several challenges. Treatment objectives for generalised aggressive periodontitis include control of infections, arresting disease progression, correcting anatomic defects, replacing missing teeth and maintaining periodontal health. This clinical report describes the sequenced treatment for a young adult patient with generalised aggressive periodontitis.

CASE PRESENTATION

A 22-year-old woman reported to the department for treatment of proclined teeth. She was very self-conscious about the appearance of her teeth (figures 1–3). A detailed medical, dental and family history was obtained. Her medical and family



Figure 2 Preoperative clinical picture, lateral view, right side.



CrossMark

To cite: Livingstone D, Murthy V, Reddy VK, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-204588

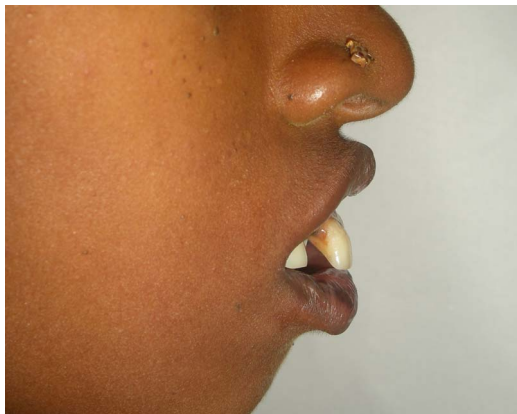


Figure 3 Incompetent lips.

history were unremarkable. Extraoral examination revealed incompetent lips with a short upper lip.

Clinical examination revealed presence of all teeth except maxillary right third molar. There was pathological migration of maxillary right and left central and lateral incisors. A quack partial denture was also present between the maxillary central incisors. The partial denture was tied to the abutment using a wire. Grade I mobility was present in mandibular left and right central incisors. Grade III mobility was present in maxillary right and left central and lateral incisors. Generalised pocket depth was found to be 3–7 mm. Mild to moderate calculus deposits were also present in some teeth. The gingiva was swollen and was bleeding on probing. Grade I furcation was present in mandibular right and left second molars and grade II furcation was present in mandibular right first molar.

INVESTIGATIONS

- The radiographic examination with panoramic radiograph revealed generalised horizontal bone loss ([figure 4](#)).
- Routine blood investigations were performed and were normal.
- Culture and sensitivity tests were carried out for prescribing antibiotics.

TREATMENT

A treatment plan aimed at improving the patient's overall periodontal health was developed. In the first appointment,

supragingival scaling was performed and the patient was given detailed oral hygiene instructions. She was advised to use 0.12% chlorhexidine mouth wash twice daily (Periogard, Colgate-Palmolive) to enhance plaque control. Extraction of maxillary right and left central and lateral incisors was planned in the next appointment. Maxillary and mandibular impressions were made before extraction and an immediate interim removable partial denture was fabricated. Extraction of maxillary right and left central and lateral incisors was performed and the interim removable prosthesis was placed.

Conventional flap surgery was carried out in all four quadrants in stages. Adjuvant antibiotic therapy with 100 mg doxycycline once daily for 21 days and metronidazole 500 mg thrice daily for 8 days was administered to the patient after culture and sensitivity testing. Residual pocket depth of 2–4 mm was present during 3-month follow-up.

Definitive prosthodontic treatment was planned after healing and when the patient was able to maintain good oral hygiene. The patient was not comfortable with the removable prosthesis and insisted on a fixed type of restoration. Diagnostic preparation and diagnostic wax up for a fixed partial denture, replacing maxillary right and left central and lateral incisors with the maxillary right and left canines as abutments, was performed. The mesio-distal width of the central and lateral incisors was larger and was not complementing the patient's face. Adding an additional pontic to the diagnostic wax up did not improve aesthetics. Hence, as an alternative to conventional fixed partial denture design a fixed partial denture with loop connectors was planned to address aesthetics and space problem.

A diagnostic wax up with loop connectors was performed and the pros and cons of the design were discussed with the patient ([figures 5](#) and [6](#)). With the patient's consent, it was decided to proceed with the treatment plan. Treatment with implants could not be carried out for economic reasons.

Crown preparations were made on the maxillary right and left canines with chamfer finish line. Impression of the maxillary arch was taken with silicone impression material (Speedex; Coltene/Whaledent Inc) using a putty wash technique. The impressions were poured and dies were prepared. Wax pattern of the framework was fabricated and casting was done. A metal try-in was made to check the fit of the framework. Ceramic firing was carried out (D-sign, Ivoclar, Vivadent AG) and the restoration was finished and polished. The fixed partial denture was tried and cemented with type I glass ionomer cement (GC, gold label; GC Corporation, Tokyo, Japan; [figures 7](#) and [8](#)).

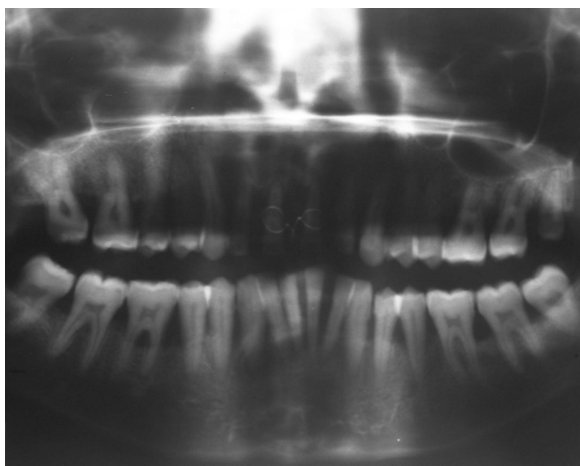


Figure 4 Panoramic radiograph.



Figure 5 Diagnostic wax up.



Figure 6 Diagnostic wax up.

OUTCOME AND FOLLOW-UP

Regular follow-up of patients with aggressive periodontitis plays a major role in the overall success of the treatment. Recall every 3 months for a period of 1 year in this patient kept the disease under control. She was highly satisfied with the aesthetic and overall outcome of the treatment and was further motivated to achieve meticulous oral hygiene. At the end of 1 year, no complications associated with the oral rehabilitation were present. With time there was also an improvement in the profile of the lip (figure 9). The patient was also able to maintain good oral hygiene.

DISCUSSION

Early detection of aggressive periodontitis plays an important role since preventing further destruction is often more predictable than attempting to regenerate lost supporting tissue. Studies have shown that individuals with aggressive (early-onset) periodontitis could be effectively maintained with clinical and microbiological improvements after active periodontal therapy.³ Studies have also found that systemic antimicrobials in conjunction with scaling and root planing offer benefits over scaling and planing alone in terms of clinical attachment level, probing pocket depth and reduced risk of additional attachment loss.⁴ This patient was responding well to doxycycline and metronidazole.



Figure 8 Postoperative clinical picture, occlusal view.

Successful management of patients with aggressive periodontitis must include tooth replacement as part of the treatment plan. Replacing lost teeth can be achieved by using a removable partial denture, fixed partial denture and implant supported prosthesis. Since this patient could not tolerate a removable partial denture and could not afford dental implants, a fixed partial denture was fabricated to replace lost teeth. The use of loop connectors in this patient improved aesthetics considerably.

One of the disadvantages of using loop connectors is the difficulty in maintaining oral hygiene. In this patient, a loop connector was placed in the self-cleansing area and the patient was able to maintain good oral hygiene with an interdental cleaning aid. The loop in relation to maxillary right central incisor and maxillary left lateral incisor was modified to avoid a midline diastema. In addition, the patient did report on speech difficulties in the initial period.

From a biomechanical perspective, the control of potential movement owing to a non-rigid design under functional load is critical for survival of the prosthesis. In this case, mobility of the prosthesis was not perceived by the patient during function and was not observed clinically. Conventional fixed dental prosthesis connectors are understandably more rigid as compared to loop connectors. This flexibility of loop connector can relatively be overcome by using shorter lengths and increasing the diameter of the loop, and keeping their form as round as possible.⁵

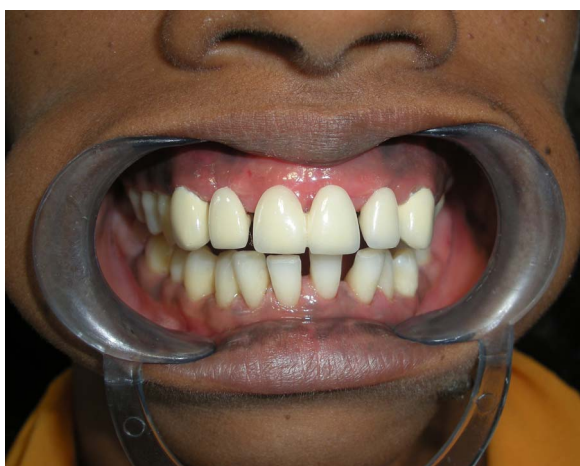


Figure 7 Postoperative clinical picture, lateral view, right side.



Figure 9 Improvement in the lip profile.

Photoelastic stress analysis has revealed that within the connector, the highest stress was found at the gingival region of the connector and the lowest in the middle of the connector.^{6 7} Hence, due consideration should be given when designing the loop connector. The cumulative survival of porcelain fused to metal full coverage restorations joined with loop over a period of 8 years was 90.9% and fracture of the loop connector did occur in a patient due to narrow diameter of the loop.⁸ Also, connector geometry affects the strength of ceramic materials.^{9 10} Smoother, less angled and more round connectors lower stress levels.¹¹ A similar design strategy was also followed in this patient to reduce stress.

In a 5-year follow-up study of patients with aggressive periodontitis, the periodontal disease progression was arrested in 95% of the initially affected lesions using comprehensive mechanical, surgical and antimicrobial therapy with supportive periodontal maintenance every 3–4 months. Only 2–5% of the patients experienced loss of periodontal support.¹² Hence, long-term follow-up is mandatory in such patients.

Learning points

- Controlling the disease and restoring periodontal health is essential for successful prosthodontic rehabilitation in patients with aggressive periodontitis.
- Treatment of aggressive periodontitis is often complex and requires an interdisciplinary approach.
- In this patient, aesthetics were improved by using a fixed partial denture with loop connector, as the design managed tooth size arch length discrepancy effectively.

Contributors DL and VM managed the case prosthodontically. VKR managed the case periodontally. AP conducted review of the literature.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Deas DE, Mackey SA, Mc Donnell HT. Systemic disease and periodontitis: manifestations of neutrophil dysfunction. *Periodontol* 2000 2003;32:82–104.
- 2 Delcourt-Debruyne EM, Boutigny HR, Hildebrand HF. Features of severe periodontal disease in a teenager with Chediak-Higashi syndrome. *J Periodontol* 2000;71:816–24.
- 3 Kamma JJ, Baehni PC. Five-year maintenance follow-up of early-onset periodontitis patients. *J Clin Periodontol* 2003;30:562–72.
- 4 Herrera D, Sanz M, Jepsen S, et al. A systematic review on the effect of systemic antimicrobials as an adjunct to scaling and root planning in periodontitis patients. *J Clin Periodontol* 2002;29(Suppl 3):136–59.
- 5 Carr AB, McGivney GP, Brown DT. Direct retainers. In: *McCracken's removable partial prosthodontics*. 11th edn. St Louis, MO: Mosby, 2005:86–8.
- 6 Kou W, Kou S, Liu H, et al. Numerical modelling of the fracture process in a three unit all ceramic fixed partial denture. *Dent Mater* 2007;23:1042–9.
- 7 Oh W, Gotzen N, Anusavice KJ. Influence of connector design on fracture probability of ceramic fixed partial dentures. *J Dent Res* 2002;81:623–7.
- 8 Bhandari S, Bakshi S. Survival and complications of unconventional fixed dental prosthesis for maintaining diastema and splint pathologically migrated teeth: a case series up to 8 years follow-up. *Indian J Dent Res* 2013;24:375–80.
- 9 Kamposiora P, Papavasiliou G, Bayne SC, et al. Stress concentration in all-ceramic posterior fixed partial dentures. *Quintessence Int* 1996;27:701–6.
- 10 Fischer H, Weber M, Marx R. Lifetime prediction of all-ceramic bridges by computational methods. *J Dent Res* 2003;82:238–42.
- 11 Plengsombut K, Brewer JD, Monaco EA Jr, et al. Effect of two connector designs on the fracture resistance of all-ceramic core materials for fixed dental prosthesis. *J Prosthet Dent* 2009;101:166–73.
- 12 Buchmann R, Nunn ME, Van Dyke TE, et al. Aggressive periodontitis: 5-year follow-up treatment. *J Periodontol* 2002;73:675–83.

Copyright 2015 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow