



# Clinical Case Report on Treatment of Generalized Aggressive Periodontitis: 5-Year Follow-up



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*Generalized aggressive periodontitis (GAgP) is a distinct type of periodontal disease associated with considerably more rapid periodontal tissue destruction than chronic periodontitis. This study presents the 5-year follow-up of a patient with GAgP. A 29-year-old man reported experiencing increasing gingival recession. He was treated using cause-related therapy, provisional splints, and flap surgery combined with allograft grafting and was followed up for 5 years. This case study shows that elimination of infectious microorganisms and meticulous long-term maintenance provide an effective treatment modality for aggressive periodontitis cases. This treatment modality can restore the masticatory function and provide the GAgP patient with improved quality of life.* (Int J Periodontics Restorative Dent 2015;35:395–400. doi: 10.11607/prd.2113)

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Generalized aggressive periodontitis (GAgP) affects a minority of patients but remains a highly noteworthy disease because of its association with severe destruction of the supporting apparatus in relatively young patients. The characteristics of aggressive periodontitis are rapid progression and destruction of periodontal tissues, often associated with a high risk of disease relapse.<sup>1</sup> A compromised remaining dentition and a tendency toward refractory disease render the establishment of a treatment plan that provides an adequate long-term prognosis. GAgP has no universal treatment protocol.<sup>2</sup> Following the control of the infection, periodic maintenance treatment designed to maximize the effectiveness of the patient's oral hygiene and remove subgingival biofilms at regular intervals is critical for long-term prevention of disease recurrence. Reports on the long-term follow-up of patients treated for GAgP are scant.<sup>2–4</sup>

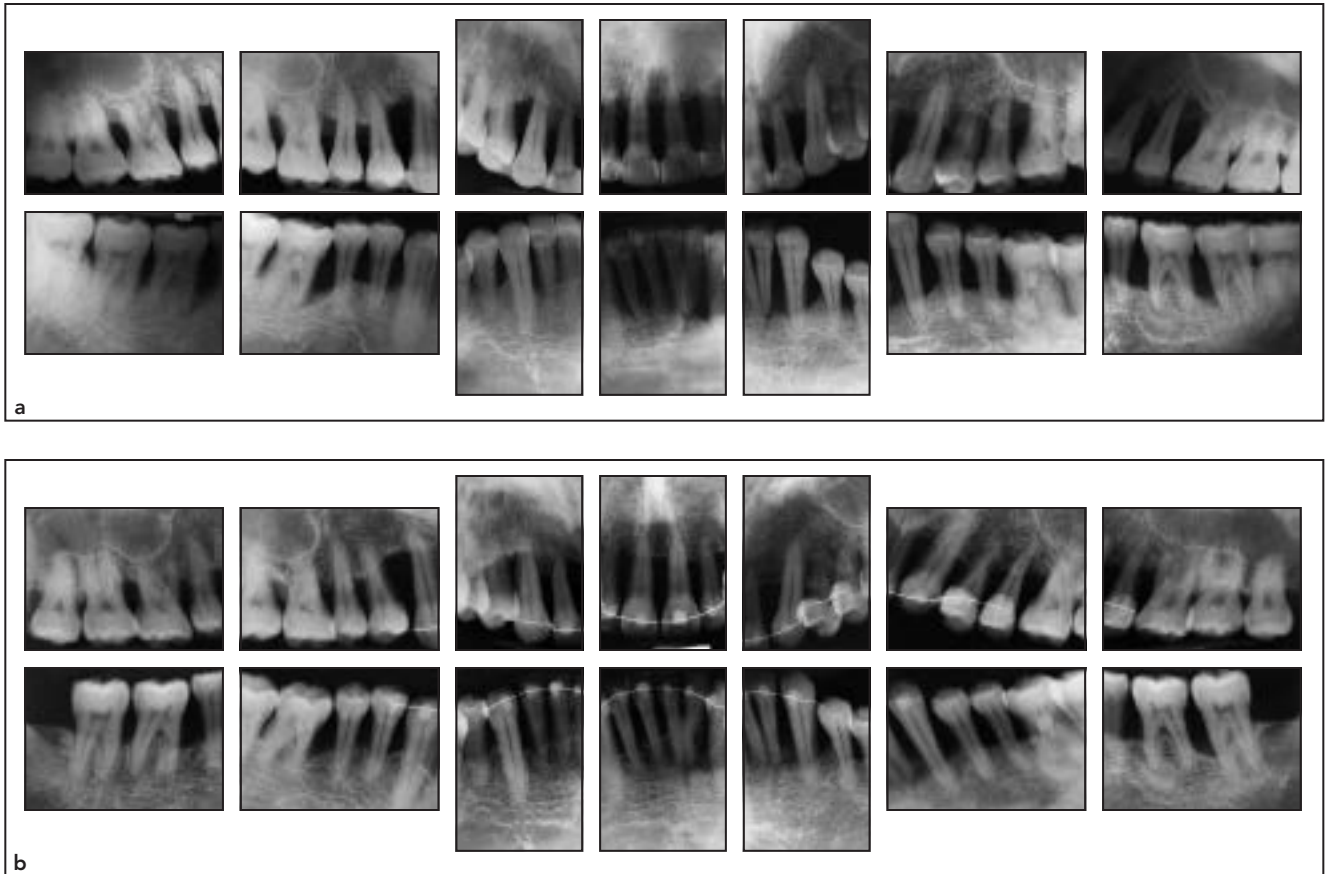
This study presents the 5-year clinical outcome of a patient diagnosed with GAgP and treated using a cause-related therapeutic regimen accompanied by periodontal surgery with bone grafting.

## Case description

A 29-year-old man visited the Division of Periodontics, Kaohsiung



**Fig 1** Clinical photographs. (a) Initial views. (b) Five-year follow-up.



**Fig 2** Radiographs. (a) Initial set. (b) Five years after treatment.

Medical University Hospital, Kaohsiung Medical University, Kaohsiung, Taiwan, complaining of frequent fracture of the splinting wire over his anterior teeth. The patient also reported experiencing increasing gingival recession. He had received periodontal treatment for 3 years at a local dental clinic. His peripheral blood results were within reference ranges and correlated with the absence of any history of systemic diseases. However, a family aggregation of GAgP was suspected because the patient's grandfather and grandmother had lost several of their teeth at a young age. The pa-

tient was a nonsmoker without other noteworthy oral habits.

The initial intraoral examination revealed that the splinting material was located over the maxillary and mandibular anterior teeth. Generalized severe periodontal destruction with multiple intrabony defects was observed, with 26 teeth having a probing depth (PD) > 5 mm (Fig 1). A full-mouth series of periapical films was obtained using a long-cone parallel technique prior to periodontal treatment, 1 year after periodontal treatment, and 5 years after initial periodontal treatment (Fig 2).

## Treatment

The patient was initially treated using a cause-related therapeutic regimen consisting of scaling, root planing, and oral hygiene instruction. After full-mouth scaling, the original splinting material was removed. Provisional splints were placed using ligature wires and composite resin restorative materials. The clinical parameters were evaluated 4 weeks after the completion of root planing. No subgingival microbial analysis nor antibiotic sensitivity testing was performed, and no antibiotics were

**Table 1** Clinical parameters (mean  $\pm$  SD) at baseline and 4 weeks after nonsurgical treatment and at 12 months and 5 years after surgical treatment

	Baseline	4 wk	12 mo	5 y	Mean difference (95% CI), baseline to 5 y	P value, baseline to 5 y
PD (mm)	3.8 $\pm$ 2.0	3.3 $\pm$ 1.6	2.7 $\pm$ 0.7	2.7 $\pm$ 0.7	1.18 (0.93 to 1.43)	< .001
GR (mm)	2.0 $\pm$ 1.7	2.3 $\pm$ 1.7	2.9 $\pm$ 1.7	3.0 $\pm$ 1.8	-0.99 (-0.83 to -1.16)	< .001
CAL (mm)	5.8 $\pm$ 2.3	5.6 $\pm$ 2.2	5.7 $\pm$ 1.8	5.6 $\pm$ 1.8	0.19 (-0.03 to 0.41)	.09
PLQ (%)	76.1	16.7	7.8	12.2	0.64 (0.57 to 0.71)	< .001
BOP (%)	20.6	25.6	7.8	6.7	0.44 (0.36 to 0.52)	< .001

CI = confidence interval; PD = probing depth; GR = gingival recession; CAL = clinical attachment level; PLQ = plaque; BOP = bleeding on probing.

utilized in therapy. The examination at 4 weeks revealed 12 teeth with a PD > 5 mm; therefore, surgical treatment was recommended. The full-thickness mucoperiosteal flaps were raised, and thorough root planing was performed. The deep intrabony defects (sites with vertical depth > 3 mm) over the maxillary right first and second molars and left first and second premolars as well as the mandibular lateral incisors and first and second molars bilaterally were filled with demineralized freeze-dried bone allografts (OraGraft, Lifenet). The flaps were then repositioned tension-free over the defect and sutured close to the bone and teeth using vertical internal mattress sutures and simple loop sutures. The patient was instructed to rinse twice a day for 6 weeks with chlorhexidine digluconate before commencing toothbrushing in the treated areas. The sutures were removed 14 days after the procedure.

Recall appointments were made every week during the first 2 months postsurgery and once per month for the subsequent 4 months. Additional recall appointments were made every 3 months during the 5-year observation period.

Clinical data were collected at baseline, 4 weeks after the nonsurgical periodontal treatment, and 12 months and 5 years after the surgical treatment (see Figs 1 and 2).

## Results

During the 5-year observation period, the mandibular third molars were the only teeth extracted from the patient. At the 5-year follow-up, the mean PD was reduced from 3.8  $\pm$  2.0 mm to 2.7  $\pm$  0.7 mm, and the mean clinical attachment level (CAL) had changed from 5.8  $\pm$  2.3 mm to 5.6  $\pm$  1.8 mm. In addition, the O'Leary Plaque Index was reduced from 76.1% to 12.1%, and the per-

centage of sites with bleeding on probing dropped from 20.6% to 6.7% ( $P < .001$ ; Table 1).

At the 5-year follow-up, in the sites where the initial PD was  $\geq$  7 mm, a significant reduction in PD from 8.1  $\pm$  1.0 mm to 3.4  $\pm$  0.6 mm ( $P < .001$ ) and a significant reduction in CAL from 9.5  $\pm$  1.6 mm to 7.1  $\pm$  2.0 mm ( $P < .001$ ) were observed. In the sites where the initial PD was 4 to 6 mm, a significant reduction in PD from 4.9  $\pm$  0.7 mm to 2.9  $\pm$  0.6 mm ( $P < .001$ ) and a significant reduction in CAL from 6.6  $\pm$  1.6 mm to 5.8  $\pm$  1.7 mm ( $P < .001$ ) were observed (Table 2).

## Discussion

GAgP is a type of periodontal disease that results in early tooth loss because of episodic and rapid destruction of the periodontal tissues.<sup>5</sup> GAgP can lead to edentulism early in life. Although no widely accepted

**Table 2** Comparison of different baseline PD values (mean  $\pm$  SD) for PD and CAL at baseline and 4 weeks, 12 months, and 5 years after treatment

	Baseline	4 wk	12 mo	5 y	Mean difference (95% CI), baseline to 5 y	P value, baseline to 5 y
<b>Baseline PD <math>\geq</math> 7 mm</b>						
PD (mm)	8.1 $\pm$ 1.0	6.3 $\pm$ 1.7	3.7 $\pm$ 0.7	3.4 $\pm$ 0.6	4.65 (4.24 to 5.06)	< .001
CAL (mm)	9.5 $\pm$ 1.6	8.8 $\pm$ 1.6	7.8 $\pm$ 1.7	7.1 $\pm$ 2.0	2.40 (1.80 to 3.00)	< .001
<b>Baseline PD = 4 to 6 mm</b>						
PD (mm)	4.9 $\pm$ 0.7	3.7 $\pm$ 0.9	3.0 $\pm$ 0.5	2.9 $\pm$ 0.6	1.97 (1.74 to 2.19)	< .001
CAL (mm)	6.6 $\pm$ 1.6	6.1 $\pm$ 1.8	5.9 $\pm$ 1.7	5.8 $\pm$ 1.7	0.87 (0.62 to 1.12)	< .001
<b>Baseline PD <math>\leq</math> 3 mm</b>						
PD (mm)	2.3 $\pm$ 0.6	2.3 $\pm$ 0.8	2.4 $\pm$ 0.6	2.3 $\pm$ 0.6	0.02 (-0.11 to 0.15)	.75
CAL (mm)	4.5 $\pm$ 1.7	4.7 $\pm$ 1.7	5.1 $\pm$ 1.6	5.2 $\pm$ 1.6	0.69 (0.48 to 0.91)	< .001

CI = confidence interval; PD = probing depth; CAL = clinical attachment level.

treatment protocol exists for the management of patients with GAgP, investigators have suggested that the initial step in the treatment of GAgP should be a cause-related therapeutic phase aimed at the reduction or elimination of the pathogenic microflora.<sup>6-9</sup> Meticulous initial therapy and good oral hygiene are considered to be prerequisites for successful periodontal therapy.<sup>10</sup>

Because the low prevalence of GAgP renders the recruitment of sufficient numbers of patients for controlled clinical trials of different treatment modalities problematic, the response to periodontal treatment in aggressive periodontitis is not well understood.<sup>11</sup> Studies have shown that anti-infective treatment is usually effective in the management of chronic and aggressive forms of periodontitis. The patient in this case study showed improved CAL (2.4 mm) and PD (4.7 mm) in the sites where the initial PD was  $\geq$  7 mm. Previously, Mengel et al<sup>12</sup>

used clinical indices to evaluate a group of 16 healthy nonsmoking GAgP patients undergoing active therapy and maintenance for 5 years. Compared with the present case, they observed a slightly higher attachment gain (3.0 mm) and a slightly lower PD reduction (3.6 mm).

Deas and Mealey<sup>13</sup> compared the responses of chronic and aggressive periodontitis to anti-infective therapy and concluded that both diseases respond well to this initial management strategy. All forms of regenerative therapy were also effective in both diseases. However, Gunsolley et al<sup>14</sup> reported that the untreated sites in patients with GAgP showed increased loss of attachment and increased tooth loss.

The long-term success of GAgP therapy is dependent on a rigorous program of periodontal maintenance care designed to control the overgrowth of potential pathogens within the biofilm. In the current patient, the initial periodontal

treatment reduced the periodontal PD and improved attachment levels, and compliance and regular dental follow-ups stabilized his periodontal status. Table 1 reveals that the PD value is consistent from 12 months to 5 years. Furthermore, there is no significant difference in CAL values between baseline, 4 weeks, 12 months, and 5 years. These showed a successful treatment response and no continuing loss of periodontal attachment.

Buchmann et al<sup>2</sup> previously reported that a comprehensive periodontal treatment regimen consisting of mechanical and surgical therapy was appropriate for long-term stabilization of periodontal health and arrest of periodontal disease progression in 95% of the initial lesions.

Osseous grafting and guided tissue regeneration are the two techniques used in the most successful treatment modalities for periodontal regeneration.<sup>15</sup> Bone

replacement graft is the most widely used treatment option for the correction of periodontal osseous defects.<sup>16</sup> Typically, aggressive periodontitis affects younger patients who might not be able to be treated with expensive materials such as enamel matrix derivative (eg, Emdogain, Straumann) or barrier membrane. In terms of economic considerations, bone grafting is a good choice for periodontal surgery in young patients. However, the current patient preferred to receive an allograft as the regenerative material.

Although additional case reports with long-term periodontal follow-up are necessary to validate the effectiveness of a treatment modality for GAgP, this case report shows that long-term stability can be achieved if an adequate maintenance schedule is adhered to following the initial periodontal treatment and periodontal surgery.

## Conclusions

This reported case emphasizes that the management of GAgP should involve a nonsurgical phase, surgical therapy, and meticulous lifelong supportive periodontal treatment. According to the authors' research, this is the first study to report the successful treatment of a GAgP patient with cause-related therapy combined with periodontal surgery and allogeneic bone grafting. However, further investigation and clinical studies are required to confirm these results.

## Acknowledgments

The authors reported no conflicts of interest related to this study.

## References

1. Armitage GC. Development of a classification system for periodontal diseases and conditions. *Ann Periodontol* 1999; 4:1–6.
2. Buchmann R, Nunn ME, Van Dyke TE, Lange DE. Aggressive periodontitis: 5-year follow-up of treatment. *J Periodontol* 2002;73:675–683.
3. Renvert S, Nilveus R, Dahlen G, et al. 5-year follow up of periodontal intraosseous defects treated by root planing or flap surgery. *J Clin Periodontol* 1990; 17:356–363.
4. Kamma JJ, Baehni PC. Five-year maintenance follow-up of early-onset periodontitis patients. *J Clin Periodontol* 2003;30: 562–572.
5. Parameter on aggressive periodontitis. American Academy of Periodontology. *J Periodontol* 2000;71:867–869.
6. Wennstrom A, Wennstrom J, Lindhe J. Healing following surgical and non-surgical treatment of juvenile periodontitis. A 5-year longitudinal study. *J Clin Periodontol* 1986;13:869–882.
7. Waerhaug J. Plaque control in the treatment of juvenile periodontitis. *J Clin Periodontol* 1977;4:29–40.
8. Saxen L, Asikainen S, Sandholm L, Kari K. Treatment of juvenile periodontitis without antibiotics. A follow-up study. *J Clin Periodontol* 1986;13:714–719.
9. Gjeramo P. The treatment of periodontal disease in the mixed dentition. *Int Dent J* 1981;31:45–48.
10. Cortellini P, Pini-Prato G, Tonetti M. Periodontal regeneration of human infrabony defects (V). Effect of oral hygiene on long-term stability. *J Clin Periodontol* 1994;21:606–610.
11. Xajigeorgiou C, Sakellari D, Slini T, et al. Clinical and microbiological effects of different antimicrobials on generalized aggressive periodontitis. *J Clin Periodontol* 2006;33:254–264.
12. Mengel R, Schreiber D, Flores-de-Jacoby L. Bioabsorbable membrane and bioactive glass in the treatment of intrabony defects in patients with generalized aggressive periodontitis: Results of a 5-year clinical and radiological study. *J Periodontol* 2006;77:1781–1787.
13. Deas DE, Mealey BL. Response of chronic and aggressive periodontitis to treatment. *Periodontol* 2000 2010;53: 154–166.
14. Gunsolley JC, Califano JV, Koertge TE, et al. Longitudinal assessment of early onset periodontitis. *J Periodontol* 1995; 66:321–328.
15. Garrett S. Periodontal regeneration around natural teeth. *Ann Periodontol* 1996;1:621–666.
16. Reynolds MA, Aichelmann-Reidy ME, Branch-Mays GL, Gunsolley JC. The efficacy of bone replacement grafts in the treatment of periodontal osseous defects. A systematic review. *Ann Periodontol* 2003;8:227–265.

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