

**RAPPORTEURS**

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## study

# Tooth loss in generalised aggressive periodontitis: prognostic factors after 17 years of supportive periodontal treatment

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**RELEVANT BACKGROUND**

Aggressive periodontitis (AgP) is a form of multifactorial destructive periodontal disease, where genetic predisposition plays a significant part in its onset and progression (Genco & Borgnakke, 2013; Schaefer et al., 2014), the latter being rapid and severe (Armitage, 1999). AgP is classified into two forms: localised (LAgP) and generalised (GAgP). The most common treatment regimen for AgP is mechanical debridement (with or without adjunctive antibiotics), which appears to be successful in the long-term retention of affected teeth. However, there are few studies reporting tooth survival over long follow-up periods and most of these cover a mixed LAgP/GAgP population. Thus, it remains uncertain whether teeth in GAgP patients can be retained for longer periods or even for life. The identification of factors associated with tooth loss in GAgP patients would be necessary to obtain individualised treatment concepts for AgP.

**AIMS**

To assess the risk of tooth loss and to identify its prognostic factors in GAgP patients receiving periodontal treatment.

**MATERIALS AND METHODS**

This retrospective longitudinal study included 57 GAgP patients treated between 1982 and 1998 in the Department of Periodontology of Christian-Albrechts-University of Kiel (Germany). They were examined before (T0) and after (T1) active periodontal therapy (APT) as well as after (T2) supportive periodontal therapy (SPT).

To be included in the study, the generalised interproximal attachment loss had to affect at least three permanent teeth, other than molars and incisors, and bone loss  $\geq 50\%$  at  $\geq 2$  teeth had to be present. Only patients who had received SPT for  $\geq 9$  years with  $\geq 1$  visit/year including an annual periodontal charting as well as a radiographic assessment at T0 and at T2 were included. APT (duration =  $1.3 \pm 0.8$  years) consisted of non-surgical debridement (scaling and root planing, SRP), combined with eventual antibiotic prescription (metronidazole/amoxicillin) if severe periodontal destruction and residual inflammation after SRP was present. Additional surgical treatment (open-flap debridement, root resection, tunnelling) was performed if indicated. No pocket-elimination surgery, osseous resection, augmentation of intrabony defects, or regenerative therapy was undertaken. Splinting of mobile teeth was performed in some cases. Tunnelling or molar root resection was performed only if non-cleanable furcations (grade II/III) showed persistent inflammation. SPT (duration =  $17.4 \pm 4.8$  years [range 9-28]) included dental-hygiene re-motivation, SRP of residual pockets, and – if necessary – open-flap debridement with eventual antibiotics.

To assess the prognostic factors of tooth loss, 10 variables were taken into consideration for the analysis: age at T1, gender, smoking status at T1, number of teeth at T1, maximum probing pocket depth (PPD) at T1, dental arch, mobility, bone loss, furcation involvement, and antibiotic therapy during active periodontal therapy.

# results

- 57 patients with a mean age  $34.7 \pm 8.0$  years at T0 participated in the study and 1,505 teeth (1,016 non-molars, 489 molars) were considered. During APT, four patients were treated only non-surgically and 53 surgically after completion of non-surgical treatment. Twenty-four patients received adjunctive systemic antibiotic therapy during APT ( $n=15$ ) and SPT ( $n=13$ ).
- Overall, only 9.5% of teeth were lost over the long-term follow-up of this study, with a low rate of annual tooth loss ( $0.14 \pm 0.18$  teeth per year and per patient). During SPT, three patients (5%) lost  $\geq 10$  teeth, 14 (25%) lost 4-9 teeth, and 40 (70%) lost 0-3 teeth. The PPD of all teeth decreased throughout the study. The mean PPD of surviving teeth at T0 ( $5.8 \pm 2.1$ mm) and T1 ( $3.5 \pm 1.1$ mm) was lower compared to that of lost teeth ( $T_0=7.16 \pm 2.18$ mm,  $T_1=4.63 \pm 1.66$ mm). Extracted teeth were lost with a mean PPD of  $6.49 \pm 2.53$ mm. Patients who received adjunctive antibiotics in APT showed higher PPDs at T0 compared to patients who received only mechanical debridement. A total of 34.6% of teeth surviving during SPT showed a bone loss (BL)  $>50\%$  at baseline, compared to 70% for teeth lost during SPT. At T2, only 30% of surviving – but 68% of extracted – teeth showed BL  $>50\%$ .
- Five of the 10 independent variables included in the regression analysis showed a significant association with tooth loss: upper dental arch (HR=1.94), residual pockets (HR=1.41), furcation involvement (I: HR=4.04, II: HR=4.44, III: HR=4.00), increased mobility (III: HR=5.39), and smoking (HR=4.94).



## LIMITATIONS

- This was a retrospective study where treatment outcomes (tooth loss or retention) were not only the result of the disease but also of individual and often non-calibrated decision-making.
- The study was unable to discriminate tooth loss caused by periodontal reasons.
- It was not possible to assess the difference in tooth-loss rates in patients lost to follow-up.
- A relatively large number of patients were not included in the study because of a lack of data.
- It is not possible to compare the applied conservative treatment with other periodontal treatment concepts.
- Because of the specific sample of compliant patients treated in a specialised university-based setting, the generalisation of the findings can only be partial.



## CONCLUSIONS

- The study demonstrated the low rate of tooth loss in compliant GAgP patients (0.14 lost per year and per patient) and the long-term and possibly lifelong retention of the majority of teeth.
- Risk of tooth loss was significantly increased for teeth of the upper dental arch, teeth presenting residual PPD  $>6$ mm, teeth with furcation involvement, teeth with increased mobility, and in active smokers.



## IMPACT

- The clinical impact of this study is that early extraction of teeth in GAgP patients should be avoided – or at least postponed until the completion of APT – when the possible prognostic factors can be assessed comprehensively.
- Identification of risk factors could help the implementation of individualised treatment plans.



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