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Research Article

Compliance with Periodontal Maintenance and Tooth Loss

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Abstract

Introduction: Periodontal disease is one of the major causes of tooth loss. Periodontal maintenance is the most important phase in the management of patients with chronic periodontal disease. This is not only limited to frequent recall visits but also includes the patient's education about periodontal disease progression.

Aim: This study aimed to measure tooth loss in patients who were compliant with periodontal recall and came back for their periodontal maintenance either at a three- or six-month interval.

Material and methods: 200 subjects who had periodontal treatment and were compliant with periodontal maintenance either on three or six-month recall at the faculty practice University of Pittsburgh School of Dental Medicine participated in this study. Treatment was scaling and root planning for mild periodontitis or scaling and root planning plus surgery for moderate to advanced periodontitis. Following this, the patients were on periodontal maintenance every three or six months for 5 to 20 years.

Result: Tooth loss occurred in 22 men (38.60%) and 37 women (40.22%), a difference that was not statistically significant (p=0.84); the remaining 141 participants maintained their full dentition throughout the study. While treatment modality (p=0.65) and recall intervals (p=0.139) had no significant impact on the outcome, patient compliance emerged as a highly significant factor in preventing tooth loss. (p=0.025)

Conclusion: This study highlights that long term periodontal maintenance (5-20 years) ensures clinical stability and minimal tooth. Enhancing patient education and compliance are the most effective tools in preventing periodontal disease advancement.

Keywords: Compliance; Periodontitis; Periodontal Disease; Periodontal Maintenance; Tooth Loss

Introduction

The long-term success of periodontal therapy is fundamentally a two-stage process: Active Periodontal Treatment to control the disease, followed by lifelong Supportive Periodontal Therapy to maintain clinical stability [1,2]. While professional interventions such as scaling and root planning are effective at stabilizing the periodontium, the durability of these clinical gains is heavily dependent on consistent professional monitoring and patient led oral hygiene [1]. In the absence of regular maintenance, the risk of disease recurrence and the ultimate clinical failure, such as tooth loss increases significantly [3,4].

A primary challenge in clinical practice is determining the optimal frequency of these maintenance visits. While a six-monthly dental check-up has been the traditional standard in many countries, there is an ongoing international debate regarding its universal effectiveness [5]. Evidence from systematic reviews suggests a lack of high-quality data to definitively support a fixed six-month interval for all patients, leading to a shift toward risk-based models where recall frequencies are individualized based on a clinician's assessment of a patient's specific disease risk [5,6].

Furthermore, the scientific understanding of "compliance" is complicated by varying definitions. Research has categorized attendance patterns into distinct groups: "irregular" attendees who miss a portion of their annual visits, "erratic" patients who lapse for a continuous two-year period and "non-compliers" who abandon maintenance for five years or more [2,3]. Data indicates that the pattern of attendance may be more detrimental than the frequency; patients who experience long gaps in care (erratic or non-compliant) face a much higher rate of tooth loss compared to those who maintain a more consistent, even if slightly irregular, schedule [2]. To combat the natural decline in patient motivation following initial treatment, innovative strategies are being employed. Enhancing patient comprehension through visual aids, such as intra-oral photographs, has been shown to lead to more enduring behavioral changes and improved clinical markers, including significant reductions in plaque and bleeding on probing [1]. By integrating effective motivational tools with customized, risk-based recall intervals, clinicians can better address the behavioral and biological barriers to long-term tooth retention [1,2,6].

Materials and Methods

Study Participants and Setting

This study included a sample of 200 individuals who received periodontal treatment and subsequent maintenance at the University of Pittsburgh School of Dental Medicine faculty practice. A key inclusion criterion was patient adherence to a prescribed periodontal maintenance schedule of either three or six months.

Therapeutic Procedures

The active treatment phase was tailored to the initial severity of the participants periodontal disease:

- Mild Periodontitis for patients with Stage I or II periodontitis: Patients in this category were treated with non-surgical Scaling and Root Planning (SRP).
- Moderate Periodontitis for patients with Stage III or IV periodontitis: Patients with more severe attachment loss underwent a combination of scaling and root planning followed by surgical intervention.

Longitudinal Maintenance Phase

Following the active treatment phase, all subjects entered a long-term supportive care program. These patients were monitored at regular recall intervals of three or six months for a duration ranging from 5 to 20 years. This extended follow-up period allowed for the assessment of long-term tooth retention and the efficacy of the maintenance protocols.

Statistical Evaluation

Data were analyzed using descriptive statistics to characterize the study population. Additionally, regression analysis was performed to determine the relationship between the clinical interventions, maintenance intervals and the resulting oral health outcomes over the observation period.

Results

Patient Demographics and Tooth Loss

A total of 59 participants experienced tooth loss during the observation period, consisting of 22 males and 37 females. The remaining 141 participants maintained their full dentition throughout the study. Statistical analysis revealed that gender was not a significant predictor of tooth loss ($p = 0.84$).

Impact of Treatment Modality and Recall Intervals

The type of active periodontal therapy administered, whether Scaling and Root Planning (SRP) alone or SRP combined with surgical intervention did not significantly influence the long-term rate of tooth loss ($p = 0.65$). Similarly, the specific maintenance schedule (3-month versus 6-month recall intervals) showed no statistically significant difference in outcomes ($p=0.13$), suggesting that both intervals were comparable in this cohort.

Correlation with Patient Compliance

In contrast to the demographic and treatment variables, patient compliance was found to be a highly significant factor in determining periodontal outcomes. Adherence to the prescribed maintenance program was strongly associated with tooth retention ($p = 0.025$), identifying compliance as the primary driver of long-term success in this study (Fig. 1,Table 1,2).

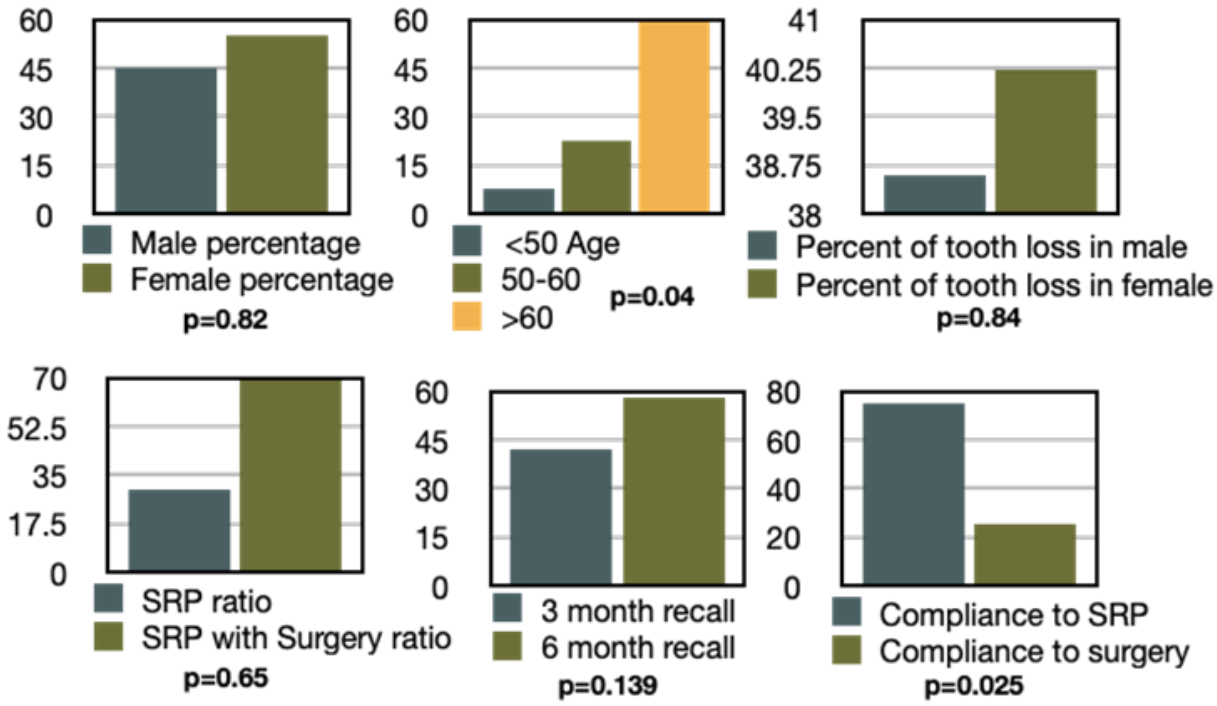

Figure 1: Comparative graphical representation of key clinical and behavioral parameters evaluated across the study groups. The bar charts illustrate variations in measured outcomes, including oral health indicators, treatment compliance, patient-reported responses and clinical follow-up parameters. Different colored bars represent distinct study groups or assessment categories, enabling visual comparison of relative trends and outcome distributions among the evaluated populations. Error bars indicate variability within each measured parameter where applicable.

Gender			Age			Loss Teeth		
Male	90	45%	<50	15	7.50%	Men	22	38.60%
Female	110	55%	50-60	45	22.50%	Women	37	40.22%
	P=0.84		>60	120	60%			
				P=0.04			P=0.84	

Table 1: Distribution of demographic characteristics and tooth loss among the study population. Gender distribution showed 90 males (45%) and 110 females (55%), with no statistically significant difference between groups (P = 0.84). Age distribution demonstrated a significantly higher proportion of participants aged >60 years (60%) compared with the 50–60 years (22.5%) and <50 years (7.5%) groups (P = 0.04). Tooth loss prevalence was comparable between men (38.6%) and women (40.22%), with no statistically significant gender-based difference (P = 0.84).

Type of Treatment			Recall Interval	Compliance 5-20 years
Scaling and root planing	60	30%	3 months 52%	150 75%
SRP with Surgery	120	70%	6 months 58%	50 25%
		P=0.65	P=0.139	P=0.025

Table 2: Distribution of periodontal treatment modalities, recall intervals and long-term patient compliance. Scaling and root planing (SRP) alone was performed in 60 patients (30%), whereas SRP combined with surgical therapy was performed in 120 patients (70%), with no statistically significant difference between treatment groups (P = 0.65). Recall interval assessment demonstrated attendance rates of 52% for 3-month recalls and 58% for 6-month recalls (P = 0.139). Long-term compliance analysis over 5–20 years revealed that 150 patients (75%) maintained regular periodontal maintenance visits, while 50 patients (25%) demonstrated irregular compliance, showing a statistically significant difference (P = 0.025).

Discussion

The long-term preservation of the natural dentition is a primary objective of periodontal therapy, yet its success is inextricably linked to the patient's commitment to maintenance protocols. Numerous longitudinal studies have underscored the critical nature of supportive care following active treatment. For instance, landmark research by Hirschfeld and Wasserman demonstrated that over a 22-year observation period in a private practice setting, only 7.1% of patients experienced tooth loss due to periodontal reasons [7]. This finding aligns with more recent work by Fardal, et al., who further corroborated that structured maintenance therapy is directly correlated with significantly lower rates of tooth loss [8].

The flexibility of recall intervals traditionally set at three months has also been a subject of long-term investigation. In a 30-year retrospective analysis, Agudio, et al., observed that while intervals could be adjusted between three and six months based on clinical needs, patients with more advanced disease required more frequent monitoring [9]. Their study concluded that even in severe cases, many periodontal patients can successfully maintain their teeth provided they remain compliant with follow-up appointments [9]. Despite the proven efficacy of these sessions in preventing disease progression. Research has documented a frequent failure among patients to adhere to professional maintenance recommendations, particularly after the completion of initial surgical or non-surgical phases [10].

Current clinical guidelines suggest that the frequency of these visits should be individualized, determined by the severity of the patient's initial periodontal status [11]. While the specific timing may vary, evidence suggests that a recall schedule ranging from three to six months is highly effective at preventing subsequent tooth loss in periodontitis patients [12]. Ultimately, the data from this study confirms that while age and initial severity are factors, the behavioral aspect of compliance remains the most significant predictor of whether a patient will retain their teeth over a multi-decade period.

Conclusion

This study showed periodontal maintenance is a very important part of periodontal treatment; there were no significant differences between male and female. People who came back for periodontal maintenance from 5 to 20 years hardly lost any teeth and their periodontal condition was stable. Patients' knowledge of periodontal disease and periodontal maintenance prevents the progression of periodontal disease.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethical Statement

The project did not meet the definition of human subject research under the purview of the IRB according to federal regulations and therefore was exempt.

Informed Consent Statement

Informed consent was obtained from all participants included in the study.

Authors' Contributions

All authors contributed equally to this paper.

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