ECRONICON OPEN ACCESS

EC DENTAL SCIENCE
Research Article

Evaluating Blood Loss and Bleeding Time Post Dental Scaling in Patients on Antiplatelet Drug Therapy: A Cross-Sectional Study

Mac Fonseca[1]*, Ritam Naik Tari[2] and James Samuel[3]

[1]*MDS Periodontics, Department of Periodontics, Goa Dental College and Hospital, Goa, India*

[2]*Assistant Professor, Department of Periodontics, Goa Dental College and Hospital, Goa, India*

[3]*Head of Department, Department of Periodontics, Goa Dental College and Hospital, Goa, India*

***Corresponding Author:** Mac Fonseca, MDS Periodontics, Department of Periodontics, Goa Dental College and Hospital, Goa, India.

Received: July 13, 2026; **Published:** September 21, 2026

Abstract

With increasing life expectancy, a growing proportion of the population is managing chronic conditions, such as cardiovascular disease and diabetes, resulting in a corresponding rise in antiplatelet therapy use. This presents significant challenges for dental practitioners, particularly regarding the risk of bleeding during oral procedures. The decision to continue or discontinue antiplatelet therapy before dental treatment requires careful consideration of both hemorrhagic and thromboembolic risks.

This cross-sectional study evaluated intraoral bleeding time and blood loss during professional mechanical plaque removal (PMPR) in patients receiving low-dose aspirin (Ecosprin 150 mg) compared with healthy controls. A total of 28 participants with Stage 1 Grade A periodontitis were enrolled: 14 in the control Group (Group A) and 14 in the aspirin group, further subdivided by appointment timing into morning (Group B) and afternoon (Group C) cohorts using a split-mouth design. Bleeding time was assessed using Duke's method and a standardized intraoral technique, while blood loss was quantified gravimetrically using pre- and post-weighted gauze.

Intraoral bleeding time was significantly prolonged in the aspirin group compared with that in the control group (36.29 ± 4.48 s vs. 27.86 ± 4.26 s; $p < 0.001$). However, Duke's method did not yield a statistically significant difference between the groups ($p = 0.08$). Notably, average blood loss was significantly lower in the aspirin group (8.36 ± 1.56 mg vs. 13.14 ± 4.70 mg; $p = 0.001$). No significant difference in blood loss was observed between the morning and afternoon sessions within the aspirin group ($p = 0.45$), indicating that appointment timing does not influence bleeding outcomes.

These findings support the current clinical recommendations that ecosprin 150 mg need not be discontinued prior to routine PMPR, as bleeding remains clinically manageable and the cardiovascular risks of therapy interruption outweigh the hemorrhagic risk.

Keywords: *Antiplatelet Therapy; Aspirin; Intraoral Bleeding Time; Oral Prophylaxis; Periodontal Management; Hemostasis*

Abbreviations

CAD: Coronary Artery Disease; AMI: Acute Myocardial Infarction; PMPR: Professional Mechanical Plaque Removal; PDD: Pocket Probing Depth; CAL: Clinical Attachment Level

Introduction

With an increasing life span, we see an increase in conditions such as diabetes, cardiovascular diseases, and respiratory diseases. This means that a growing number of people will be on various therapies to help improve their quality of life. The use of antiplatelet drug therapy has increased significantly, posing challenges in oral and maxillofacial treatment modalities [1]. Based on the German S3 guidelines for patients on anticoagulation and antiplatelet therapy, dental management involves hospitalization of patients preoperatively for invasive dental procedures [2]. This can incur high costs for patients who may refuse dental treatment. Intraoperative hemorrhage is a major surgical complication encountered in everyday surgical practice. Significant loss of intravascular volume may lead to hemodynamic instability, decreased tissue perfusion, cellular hypoxia, organ damage, and even death. Clinicians must decide whether the benefits of stopping the drugs outweigh the risks, such as an adverse thromboembolic event, or continuing the drugs and facing the eventuality of excessive bleeding from minor dental procedures [3]. Therefore, a better understanding of the overall bleeding time and blood loss in patients on antiplatelet therapy can ensure proper outpatient care.

Antiplatelet therapy includes a wide range of medications; drugs such as acetylsalicylic acid, clopidogrel, and ticagrelor inhibit platelet aggregation [4]. Indirect oral anticoagulants inhibit antithrombin or prevent the activation of vitamin K-dependent clotting factors [5]. Physicians and dentists must weigh the bleeding risks versus the thrombotic risks when interrupting the antiplatelet regimen. The balance of these risks for an individual patient is the primary consideration in the management of dental patients who are taking antiplatelet drugs and require professional mechanical plaque control. Low-dose aspirin remains the cornerstone of oral antiplatelet therapy. Current recommendations for this situation are as follows: A) For all patients with chronic stable coronary artery disease (CAD), aspirin (75 - 162 mg) should be administered and continued indefinitely. B) For all patients with stable CAD, with a risk profile indicating a high likelihood of developing acute myocardial infarction (AMI), long-term clopidogrel in addition to aspirin is administered.

Objective of the Study

The objectives of this study were: 1. To compare the bleeding time measured by Dukes method and intraoral bleeding method, 2. To evaluate if there is difference in duration and amount of blood loss based on appointment timings (morning vs afternoon) and 3. To establish the preferred appointment timings for patients taking Ecosprin 150 mg.

Materials and Methods

Patients who visited Goa Dental College and Hospital were selected, and the objectives and methods of the study were thoroughly explained to them in their native languages. A signed consent form in either English or Konkani was obtained from patients who understood the voluntary nature of participation. The study was conducted from January to March 2025 and was approved by the Goa Dental College and Hospital Institutional Review Board (Ref No. GDCH/IRB/v-2025/RPN 36-36. This cross-sectional study was designed to evaluate blood loss and bleeding time in patients receiving antiplatelet therapy.

Study design

The inclusion criteria: Patients 1) with stage 1 grade A periodontitis willing to participate in the study, 2) patients undergoing therapy with Ecosprin 150 mg, 3) patients presenting with at least 24 natural teeth or teeth-supported restorations, and 4) patients with no contraindications to the planned oral hygiene procedures.

The exclusion criteria: Patients 1) with a previous history of professional mechanical plaque removal (PMPR) in the past 3 - 6 months, 2) pregnant or lactating patients, 3) patients who had suffered a myocardial infarction in the last 6 months, 4) patients with immunosuppression, 5) patients with uncontrolled diabetes or radiation therapy of the head and neck region, 6) patients with stage 2 and stage 3 periodontitis, and 7) completely edentulous patients or patients with implant-supported restorations.

Data collection

A total of 28 patients with stage 1 grade A periodontitis in the age range of 30 - 75 years were chosen with 14 patients in the control group (patients not on ecosprin-group A) and 14 patients selected for the test group (patients on ecosprin 150 mg). The test group was divided into group B (scaling and root planing done during a morning appointment) and group C (scaling and root planing done during an afternoon appointment). This was done using a split-mouth study design to evaluate the intraoral bleeding time and amount of blood loss at two different intervals of the day in the same patients following mechanical plaque removal.

Professional mechanical plaque removal (PMPR)

The term Professional Mechanical Plaque Removal (PMPR) emerged in the dental literature in the early 2000s. It was not coined by a single person but was popularized by periodontal researchers, notably Ian Needleman and his colleagues [10].

Professional mechanical plaque removal (PMPR) is a term that describes the control of dental plaque biofilm and calculus and the management of the crown and root surfaces during periodontal care. It was previously described using terms including scaling and polishing, supra- and subgingival scaling, supragingival mechanical biofilm control, root planing, root surface debridement, scaling, and curettage.

The bleeding time is a clinical laboratory test used to evaluate platelet function. It involves the creation of a standardized incision and timing of the cessation of bleeding.

The following parameters were considered during the bleeding time test:

- Normal bleeding time:
  - Using Duke's method: Less than 3 minutes.
  - Using IVY method: Less than 8 minutes.
- A value of more than 5 minutes in the Duke's method and 10 minutes in the IVY method is concerning for coagulopathy. Abnormalities would require further evaluation, focusing on the coagulation pathway of interest.

Armamentarium

Method for intraoral bleeding time assessment

Patients were selected, and their detailed case histories were recorded. The tooth with the maximum subgingival deposits was considered for assessment before the professional mechanical plaque removal procedure. The bleeding time was recorded from the first stroke of scaling until it ceased to bleed after completion of scaling. To evaluate blood loss, the clinician wiped the blood with a pre-weighed gauze piece every 30s. The gauze swabs were then immediately re-weighed postoperatively before discarding them from the operative field. Blood loss was calculated based on the weight difference between the two. This method was used because it is quick, facile, and inexpensive. No elaborate techniques are required, and this method is easily replicable.

Clinical parameters considered

- Pocket probing depth (PDD)
- Clinical attachment level (CAL).

Statistical analysis

A pilot study was conducted to determine the precise sample size required for the main study. Sample size estimation was performed using the G*Power software. The formula-based method for comparing two means was also applied to support the sample size calculation:

$$n = \frac{(Z_{\alpha/2} + Z_{\beta})^2 \cdot 2\sigma^2}{d^2}$$

Where:

- $Z_{\alpha/2}$ corresponds to a significance level of 0.05,
- Study power is set at 80% (Z_{β}),
- σ is the estimated standard deviation obtained from the pilot data, and
- d is the minimum detectable difference between groups.

Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) version 26.

Descriptive statistics

Descriptive statistics were used to summarize the data collected. Measures of central tendency and dispersion, including the mean and standard deviation (SD), were reported for continuous variables, while minimum and maximum values described the range. Categorical variables were summarized using frequency and percentage.

Inferential statistics

- Comparison between groups A and B/C: Differences in mean values between groups A and B/C were analyzed using the unpaired (independent) Student's t-test, assuming normal distribution of the outcome variable.
- Comparison between groups B and C: For participants with paired observations in Groups B and C, the paired Student's t-test was applied to compare the mean differences within subjects.

Statistical significance was set at $p < 0.05$.

Result

A total of 28 participants were included in the study, comprising 14 patients in the test group (patients receiving low-dose aspirin therapy) and 14 patients in the control group. Normality testing using the Shapiro-Wilk test demonstrated that most study variables were normally distributed ($p > 0.05$), except for the age in the control group, which showed a statistically significant deviation from normality ($p = 0.03$).

Demographic characteristics

The distribution of gender between the two groups was comparable. The test group consisted of 10 males (71.4%) and 4 females (28.6%), whereas the control group consisted of 5 males (35.7%) and 9 females (64.3%). The difference in gender distribution was not statistically significant ($\chi^2 = 3.59$, $p = 0.06$).

A statistically significant difference was observed in age between the two groups. The mean age of participants in the test group was 59.21 ± 9.85 years, while that in the control group was 44.64 ± 16.02 years. The Mann-Whitney U test demonstrated a significant difference between the groups ($U = 44.00$, $p = 0.01$).

Comparison of bleeding parameters between groups

The mean bleeding time in the test group was 96.43 ± 23.32s, compared with 83.57 ± 12.77s in the control group. Although the bleeding time was longer in the test group, the difference was not statistically significant ($p = 0.08$).

The mean intraoral bleeding time was significantly greater in the test group (36.29 ± 4.48s) than in the control group (27.86 ± 4.26s). The mean difference between the groups was 8.43s (95% CI: 5.03-11.82), which was statistically significant ($t = 5.10$, $p < 0.001$).

The mean average blood loss was significantly lower in the test group (8.36 ± 1.56 mg) than in the control group (13.14 ± 4.70 mg). The mean difference between the groups was −4.79 mg (95% CI: −7.51 to −2.06), which was statistically significant ($t = -3.61$, $p = 0.001$).

Comparison of morning and afternoon blood loss

To evaluate whether the timing of oral prophylaxis influenced bleeding outcomes in patients receiving aspirin therapy, the average blood loss was assessed separately during the morning and afternoon sessions.

The mean blood loss during the morning and afternoon sessions was 8.64 ± 1.99 mg and 8.07 ± 2.17 mg, respectively. Comparison with the control group demonstrated significantly lower blood loss in the morning and afternoon sessions among patients receiving aspirin therapy. Morning blood loss differed significantly from that in the control group ($t = -3.30$, $p = 0.003$), and afternoon blood loss also showed a statistically significant difference ($t = -3.66$, $p = 0.001$).

When morning and afternoon measurements within the test group were compared using a paired t-test, the mean difference was 0.57 mg (95% CI: −1.01-2.15). This difference was not statistically significant ($t = 0.78$, $p = 0.45$), indicating that the timing of the procedure did not significantly influence blood loss in patients who received aspirin therapy.

Summary of findings

Patients receiving aspirin therapy demonstrated a significantly increased intraoral bleeding time compared to healthy controls. However, no statistically significant difference was observed in the bleeding time measured using the Duke method. The average blood loss during PMPR was significantly lower in the aspirin group than that in the control group. Furthermore, no significant difference in blood loss was observed between morning and afternoon procedures in patients who received aspirin therapy.

Sex	Study Groups		Total	Chi-Square Test	
	Test	Control		Chi-Square Value	p-value
Female	4	9	13	3.59	0.06 (NS)
	28.6%	64.3%	46.4%		
Male	10	5	15		
	71.4%	35.7%	53.6%		
Total	14	14	28		
	100.0%	100.0%	100.0%		

Table 1: *Comparison of gender between the study groups.*

**p < 0.05 Statistically significant, p > 0.05 Non-significant, NS.*

Study Groups	N	Mean (SD)	Range	Median (Q1-Q3)	Mann Whitney U Test	
					U Statistic	p-value
Test	14	59.21 (9.85)	45- 74	60.00 (49.25- 66.50)	44.00	0.01*
Control	14	44.64 (16.02)	24- 73	37.50 (32.75- 63.25)		

Table 2: *Comparison of age between the study groups.*

**p < 0.05 Statistically significant, p > 0.05 Non-significant, NS.*

	Study Groups	N	Mean	SD	Mean Difference	95% Confidence Interval of the Difference		t	df	p-value
						Lower	Upper			
Bleeding Time	Test	14	96.43	23.32	12.86	-1.75	27.47	1.81	26	0.08(NS)
	Control	14	83.57	12.77						
Intraoral Bleeding (sec)	Test	14	36.29	4.48	8.43	5.03	11.82	5.10	26	<0.001*
	Control	14	27.86	4.26						
Avg Blood Loss (mg)	Test	14	8.36	1.56	-4.79	-7.51	-2.06	-3.61	26	0.001*
	Control	14	13.14	4.70						
Morning	Test	14	8.64	1.99	-4.50	-7.31	-1.70	-3.30	26	0.003*
	Control	14	13.14	4.70						
Afternoon	Test	14	8.07	2.17	-5.07	-7.92	-2.23	-3.66	26	0.001*
	Control	14	13.14	4.70						

Table 3: *Comparison of study parameters between the study groups.*

Independent Sample t-test.

**p < 0.05 Statistically significant, p > 0.05 Non-significant, NS.*

Group 1	N	Mean	SD	Mean Difference	95% Confidence Interval of the Difference		t	df	p-value
					Lower	Upper			
Morning	14	8.64	1.99	0.57	-1.01	2.15	0.78	13	0.45(NS)
Afternoon	14	8.07	2.17						

Table 4: *Comparison of bleeding between morning and afternoon in test group.*

Paired t test.

**p < 0.05 Statistically Significant, p > 0.05 Non-significant, NS.*

Discussion

The present study evaluated intraoral bleeding following oral prophylaxis in patients receiving aspirin therapy (Ecosprin 150 mg) and compared the findings with those of healthy controls. The results demonstrated that although the test group exhibited a significantly longer duration of intraoral bleeding than the control group, the bleeding remained clinically manageable and did not result in adverse events. Furthermore, there was no statistically significant difference in bleeding between the morning and afternoon assessments within the aspirin group, indicating that the schedule of appointment timings for PMPR does not influence the extent of bleeding.

Aspirin irreversibly inhibits platelet aggregation through acetylation of cyclooxygenase-1, thereby prolonging bleeding time [2]. In the present study, the mean bleeding time was higher in the test group (96.43s) than in the control group (83.57s); however, this difference was not statistically significant. These findings suggest that while aspirin exerts its expected antiplatelet effect, the degree of alteration in primary hemostasis may not be sufficient to produce clinically significant bleeding during routine PMPR. The Duke's bleeding time method was employed in this study because of its simplicity, convenience, and minimal equipment requirement. The method involves a small puncture wound on the fingertip or earlobe and remains a practical chairside assessment of primary hemostasis. Although the Ivy method is considered more standardized, the Duke method was selected because of its ease of application in a clinical setting [8].

The mean intraoral bleeding time was significantly longer in the aspirin group than in the control group. However, despite this statistically significant increase, the absolute duration of bleeding remained short and was easily controlled without the need for additional hemostatic measures. This finding is clinically important because statistical significance does not necessarily imply a clinical significance. The prolonged bleeding observed in patients receiving low-dose aspirin did not interfere with the completion of PMPR and did not pose a risk to patient safety.

Interestingly, the average blood loss measured during PMPR was significantly lower in the aspirin group than in the control group. This finding may appear counterintuitive, considering the antiplatelet action of aspirin. However, factors such as variations in gingival inflammation, periodontal status, oral hygiene practices, and individual patient characteristics may influence bleeding during scaling [9]. The reduced blood loss observed in the test group suggests that low-dose aspirin alone is not a major determinant of clinically relevant bleeding during PMPR.

Comparison of morning and afternoon bleeding measurements within the aspirin group showed no statistically significant difference. This observation is clinically relevant because many patients receiving Ecosprin are prescribed multiple medications and commonly take aspirin later in the day to minimize gastric irritation while taking other medications in the morning. The absence of a significant difference between morning and afternoon measurements suggests that PMPR can be safely performed regardless of the time of day, without concern for increased bleeding attributable to the aspirin dosing schedule.

The findings of the present study are consistent with the current evidence and recommendations regarding the continuation of antiplatelet therapy during dental procedures [3]. A systematic review and meta-analysis by Ockerman., *et al.* (2020) [6] reported comparable rates of postoperative bleeding among patients receiving dual antiplatelet therapy, single antiplatelet therapy, and those not receiving antiplatelet therapy. When bleeding occurred, it was effectively managed using local measures, and no fatal outcomes were reported. The authors concluded that the interruption of dual antiplatelet therapy before minor oral surgical procedures is not recommended. Similarly, Napenas., *et al.* (2013) [7] found no clinically significant increase in postoperative bleeding complications following invasive dental procedures in patients receiving single or dual antiplatelet therapy.

The current study extends these observations to PMPR, a procedure for which limited evidence is available. Most previous investigations have focused on tooth extractions and minor oral surgical procedures, whereas data regarding bleeding associated with nonsurgical periodontal procedures remain scarce. The present findings therefore contribute additional evidence supporting the safety of performing PMPR without discontinuation of low-dose aspirin therapy.

Current guidelines from the American Academy of Oral Medicine and other professional organizations recommend that aspirin therapy should not be discontinued before minor dental procedures because the risk of thromboembolic complications associated with interruption of therapy outweighs the risk of manageable postoperative bleeding [3]. The results of the present study support these recommendations and suggest that discontinuation of aspirin before PMPR is unnecessary.

Nevertheless, certain patients receiving antiplatelet therapy may have additional systemic conditions that increase bleeding risk, including liver disease, renal impairment, thrombocytopenia, hemophilia, other hematologic disorders, alcoholism, or concurrent cytotoxic therapy. In such circumstances, consultation with the patient's physician may be necessary before undertaking dental treatment. Any modification of the antiplatelet regimen should only be undertaken in consultation with the treating physician after careful assessment of the risks and benefits [11-13].

Limitation of the Study

The study has certain limitations. The sample size was relatively small, which may limit the generalizability of the findings. Additionally, the test group was significantly older than the control group, introducing the possibility of age-related confounding. Furthermore, only patients receiving low-dose aspirin monotherapy were evaluated, and therefore the results cannot be directly extrapolated to patients receiving dual antiplatelet therapy or anticoagulant medications. Future studies with larger sample sizes and inclusion of different antithrombotic regimens would provide further insight into bleeding outcomes following periodontal procedures.

Conclusion

Within the limitations of the present study, PMPR in patients receiving aspirin (Ecosprin 150 mg) was associated with a statistically significant increase in intraoral bleeding duration compared with healthy controls; however, the bleeding remained clinically insignificant and manageable. Bleeding time assessed using the Duke method did not differ significantly between groups, and no significant difference was observed between morning and afternoon procedures in patients receiving aspirin therapy.

The findings support current recommendations that aspirin therapy should not be discontinued before routine PMPR. The risk of clinically significant bleeding appears minimal and is outweighed by the potential cardiovascular risks associated with interruption of antiplatelet therapy. Therefore, PMPR can be safely performed in patients receiving aspirin, provided appropriate preoperative assessment and routine clinical precautions are followed.

Bibliography

1. Jakovljevic M., *et al*. "Global population aging-health care, social and economic consequences". *Frontiers in Public Health* 11 (2023): 1184950.
2. Kämmerer PW A-N Bea. "German S3 guidelines for the management of anticoagulation and anti-platelet therapy in dental surgery" (2017).
3. Kumar AJ., *et al*. "Is anti-platelet therapy interruption a real clinical issue? Its implications in dentistry and particularly in periodontics". *Journal of Indian Society of Periodontology* 13.3 (2009): 121-125.
4. M'Pembele R., *et al*. "High on-treatment platelet reactivity: aspirin versus clopidogrel". *Pharmacology* 108.1 (2023): 83-89.
5. Deftereos S., *et al*. "Prevention and treatment of venous thromboembolism and pulmonary embolism: the role of novel oral anticoagulants". *Current Clinical Pharmacology* 7.3 (2012): 175-194.
6. Ockerman A., *et al*. "Incidence of bleeding after minor oral surgery in patients on dual antiplatelet therapy: a systematic review and meta-analysis". *International Journal of Oral and Maxillofacial Surgery* 49.1 (2020): 90-98.
7. Napeñas JJ., *et al*. "Review of postoperative bleeding risk in dental patients on antiplatelet therapy". *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology* 115.4 (2013): 491-499.
8. Vane JR and Botting RM. "The mechanism of action of aspirin". *Thrombosis Research* 110.5-6 (2003): 255-258.
9. Deng K., *et al*. "Gingival bleeding on brushing as a sentinel sign of gingival inflammation: A diagnostic accuracy trial for the discrimination of periodontal health and disease". *Journal of Clinical Periodontology* 48.12 (2021): 1537-1548.
10. Trombelli L., *et al*. "Effect of professional mechanical plaque removal performed on a long-term, routine basis in the secondary prevention of periodontitis: a systematic review". *Journal of Clinical Periodontology* 42.16 (2015): S221-S236.
11. Daniel NG., *et al*. "Antiplatelet drugs: Is there a surgical risk?" *Journal of the Canadian Dental Association* 68.11 (2002): 683-687.
12. Brennan MT., *et al*. "Aspirin and bleeding in dentistry: an update and recommendations". *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology* 104.3 (2007): 316-323.
13. Burger W., *et al*. "Low-dose aspirin for secondary cardiovascular prevention-cardiovascular risks after its perioperative withdrawal versus bleeding risks with its continuation- review and meta-analysis". *Journal of Internal Medicine* 257.5 (2005): 399-414.

Volume 25 Issue 9 September 2026