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Assessing efficacy: A comparative prospective study on dental extraction protocols in patients undergoing dual antiplatelet therapy

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Abstract
Background: Dual antiplatelet therapy (DAPT) using clopidogrel and aspirin is standard for preventing thrombotic events, particularly in patients with acute coronary syndromes or undergoing percutaneous coronary intervention. Dental extractions in patients on DAPT pose bleeding concerns.
Aim: To assess the safety and efficacy of a protocol for dental extractions in patients on DAPT.
Materials and Methods: Forty patients on DAPT underwent dental extractions at Pacific Dental College and Hospital, Udaipur (2021–2023). Group I (20 patients) continued DAPT, while Group II (20 patients) ceased DAPT three days before surgery. Hemostasis was managed using dry gauze (45 min), gauze soaked in tranexamic acid (TXA), gel foam, or 1% feracrylum. Patients were provided sutures, post-op instructions, and emergency contact. Follow-ups were done at 24 hours (phone) and in-person on days 3, 7, and 10.
Results: No postoperative bleeding occurred in patients who continued DAPT. Minor immediate bleeding was effectively managed with gel foam and TXA, with no cases requiring transfusion. Basic hemostatic measures and suturing were sufficient.
Conclusions: Dental extractions can be safely performed without discontinuing DAPT. Bleeding is manageable with local measures such as gauze pressure and TXA application. Routine suturing is recommended. Further studies with larger sample sizes are needed to validate these findings.

Keywords: Aspirin, clopidogrel, tranexamic acid, dental extraction, platelet function

Introduction

The rising prevalence of cardiovascular and cerebrovascular diseases, especially in aging populations, has made managing antithrombotic therapies increasingly important. While clinicians often pause antiplatelet therapy before dental procedures to minimize bleeding risks, this may heighten the risk of thrombotic events.

Overview of Haemostasis: Haemostasis, the body's mechanism to prevent blood loss, involves:

1. **Vascular Phase:** Brief vasoconstriction (around 20 seconds) reduces blood flow.
2. **Platelet Phase:** Platelets form a temporary thrombus and release factors for coagulation.
3. **Plasma Coagulation Phase:** A cascade of reactions forms a fibrin clot within 15–20 seconds, triggered by vessel injury and activated platelets.

Risks of Stopping Antiplatelet Therapy: Although stopping antiplatelet therapy may reduce bleeding risk, it increases the chance of thrombotic events, especially during platelet recovery. This rebound effect is associated with heightened thromboxane A2 activity and reduced fibrinolysis. Balancing bleeding and thrombotic risks require careful evaluation and close communication between medical and dental teams.

Dual Antiplatelet Therapy (DAPT): DAPT combines aspirin (acetylsalicylic acid) with a P2Y12 inhibitor such as clopidogrel, ticlopidine, ticagrelor, or prasugrel. These drugs inhibit platelet function through distinct pathways.

- **Aspirin:** A nonsteroidal anti-inflammatory drug that irreversibly inhibits cyclooxygenase (COX), blocking thromboxane A2 synthesis and reducing platelet aggregation for 8–11 days. Low doses (75–150 mg/day) are common for long-term cardiovascular protection.

- **Clopidogrel:** A thienopyridine that irreversibly blocks ADP receptors essential for platelet aggregation. Activated in the liver, it takes effect within 2 hours and remains active for the platelet's lifespan (75–100 mg/day).

Currently, no universal guidelines govern bleeding management during minor oral surgeries in patients on antiplatelet therapy. Many practitioners pause treatment preoperatively, while programs like the Scottish Dental Clinical Effectiveness Programme recommend continuing therapy, though evidence is limited.

Aim: This study evaluates whether dual antiplatelet therapy must be discontinued before dental extractions or if extractions can be safely performed without stopping therapy.

Materials and Methods

This study included 40 consecutive patients who underwent dental extractions at the Department of Oral and

Maxillofacial Surgery, Pacific Dental College and Hospital, Udaipur, Rajasthan, India (2021–2023). All participants provided informed consent, and ethical approval was obtained. Procedures were performed by the same dentist to maintain consistency. Data on age, sex, medical/dental history, and dietary habits were recorded using a standardized proforma. All patients were on dual antiplatelet therapy (DAPT) with clopidogrel and aspirin. Physical fitness certificates were secured from their physicians, and bleeding/clotting times were checked pre-operatively.

Oral hygiene was assessed using the Oral Hygiene Index-Simplified (OHI-S). Extractions were performed under local anesthesia (2% lignocaine with adrenaline 1:80,000). Patients were divided into two groups:

- **Group I (20 patients):** Continued DAPT.
- **Group II (20 patients):** Paused DAPT three days before surgery.

Hemostasis was managed as follows:

- **Primary:** Dry gauze pack for 45 minutes.
- **Secondary:** Gauze soaked in tranexamic acid (TXA, 500 mg/5 ml).
- **Supplementary:** Gel foam soaked in TXA or 1% feracrylum.

All patients received simple interrupted sutures and were monitored for 60 minutes before discharge. A post-op care leaflet and a 24-hour emergency contact were provided. Patients were advised to bite on a cold, wet handkerchief for 15 minutes if bleeding occurred.

Follow-up was conducted via phone at 24 hours and clinical visits on days 3, 7, and 10 to assess delayed bleeding, socket healing, and need for further medical attention.

Figures

Fig 1: Chronic irreversible pulpitis w.r.t 46

Fig 2: Extraction socket w.r.t. 46

Fig 3: Suture applied w.r.t. 46

Fig 4: Armamentarium

Fig 5: TXA Ampoule

Delayed bleeding was assessed on the 3rd, 7th, and 10th postoperative days by checking for any bleeding from the extraction socket, recorded as "yes" for bleeding present and "no" for absent. The healing of the extraction site in both groups was evaluated using the healing index by Landry *et al*. on the same days, with outcomes categorized as very poor, poor, good, very good, or excellent (see Table 1).

Table 1: Soft tissue healing index by Landry *et al*

Very Poor	Tissue colour: >50%of gingiva red • Response to palpation : bleeding • Granulation tissue: present • Incision margin: not epithelialized, with loss of epithelium beyond incision margin • Suppuration: present
Poor	Tissue colour: >50% of gingiva red • Response to palpation : bleeding • Granulation tissue: present • Incision margin: not epithelialized, with connective tissue exposed.
Good	Tissue colour: >25% and <50% of gingiva red • Response to palpation : No bleeding • Granulation tissue: none • Incision margin: no connective tissue exposed.
Very Good	Tissue colour: >25% of gingiva red • Response to palpation : No bleeding • Granulation tissue: none • Incision margin:

Inclusion criteria

1. Patient aged between 30 to 70 years.
2. Patients undergoing dual antiplatelet therapy for a minimum period of 6 months- 1 year.
3. Grossly destructed, chronic irreversible pulpitis, non-salvageable tooth or periodontally compromised tooth.
4. ASA II and ASA III classified patients.
5. Normal BT, CT, and RBS levels.
6. Physician Consent.

Exclusion Criteria

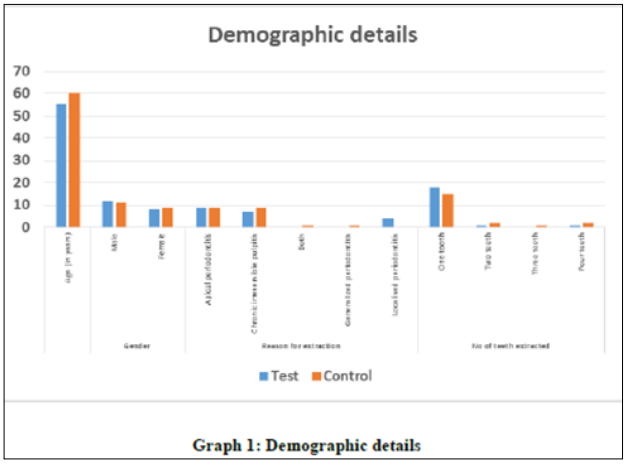
1. Bleeding and clotting disorders.
2. History of uncontrolled bleeding episodes.
3. Associated Systemic illness (Renal or Liver dysfunction).
4. Impacted tooth requiring surgical intervention.
5. Medication affecting Haemostasis (apart from antiplatelet drugs).

Results

Table 2 and Graph 1 present the baseline demographic and clinical details of the two groups. The study included patients aged 30 to 70 years, with mean ages of 55.35 years for the test group and 60.45 years for the control group, showing no significant age difference. The test group comprised 12 males and 8 females, while the control group had 11 males and 9 females (p=1.000). The primary reasons for extraction in both groups were apical periodontitis and chronic irreversible pulpitis, with no significant difference between them.

Table 2: Demographic and clinical details
Independent t test; Chi-square test

Variable	Category	Test	Control	p-value
Age (in years)	--	55.35 ± 12.27	60.45 ± 11.56	0.184
Gender	Male	12 (60)	11 (55)	1.000
	Female	8 (40)	9 (45)	
Reason for extraction	Apical periodontitis	9 (45)	9 (45)	0.181
	Chronic irreversible pulpitis	7 (35)	9 (45)	
	Both	0	1 (5)	
	Generalized periodontitis	0	1 (5)	
	Localised periodontitis	4 (20)	0	
No of teeth extracted	One tooth	18 (90)	15 (75)	0.585
	Two teeth	1 (5)	2 (10)	
	Three teeth	0	1 (5)	
	Four teeth	1 (5)	2 (10)	

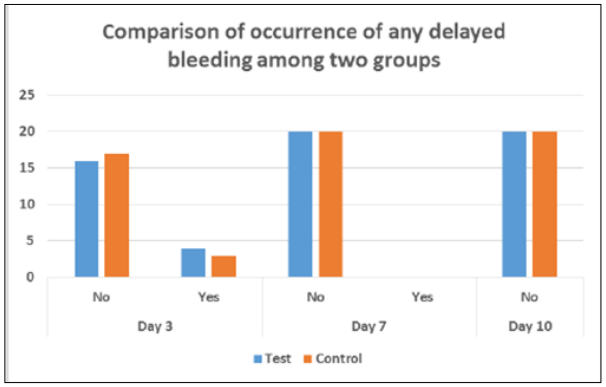


Graph 1: Demographic details

Table 3: Comparison of occurrence of any delayed bleeding among two groups

Interval	Delayed bleeding	Test		Control		p-value
		N	%	N	%	
Day 3	No	16	80	17	85	<0.001*
	Yes	4	20	3	15	
Day 7	No	20	70	20	95	0.0
	Yes	0	30	0	5	
Day 10	No	20	100	20	100	0.0
	Yes	0	0	0	0	

Fisher exact test; * indicates a significant difference at p≤0.05



Graph 2: Comparison of occurrence of any delayed bleeding among two groups

Healing of extracted socket: The table 4 compared the healing of extracted sockets among the two groups.

Table 4: Comparison of healing of extracted sockets among two groups

Interval	Healing	Test		Control		p-value
		N	%	N	%	
Day 3	Excellent	0	0	0	0	0.055
	Very Good	2	10	0	0	
	Good	13	65	19	95	
	Poor	5	25	1	5	
	Very Poor	0	0	0	0	
Day 7	Excellent	3	15	2	10	0.261
	Very Good	14	70	14	70	
	Good	1	5	4	20	
	Poor	2	10	0	0	
	Very Poor	0	0	0	0	
Day 10	Excellent	6	30	2	10	0.006*
	Very Good	9	45	3	15	
	Good	5	25	15	75	
	Poor	0	0	0	0	
	Very Poor	0	0	0	0	

Chi-square test; * indicates a significant difference at p≤0.05

Discussion

Antiplatelet drugs are widely prescribed for ischemic heart conditions, myocardial infarction, stroke, and cerebrovascular diseases. Discontinuing these agents increases thromboembolism risk, while continuation may elevate bleeding risk during dental procedures. Each antiplatelet drug acts through distinct mechanisms; for example, aspirin inhibits cyclooxygenase and thromboxane A2 synthesis, while clopidogrel blocks ADP receptors, making them effective in combination therapy for patients with stents.

The management of dual antiplatelet therapy (DAPT) in dental surgery is debated. Some studies advocate pausing therapy to reduce bleeding risk, while others suggest bleeding can be managed effectively without discontinuing treatment. Babaji *et al.* and Harder *et al.* support uninterrupted therapy for minor procedures if bleeding time is normal. Conversely, isolated reports of significant bleeding have led to inconsistent recommendations.

Our study assessed the safety of dental extractions in 40 patients on DAPT. Bleeding was successfully managed using tranexamic acid and compression. By day 7, no active bleeding was observed, and by day 10, healing was satisfactory in both groups. These findings align with Krishnan *et al.*, supporting the safety of continuing DAPT during minor dental surgeries with proper hemostatic measures. Larger studies are needed to strengthen these conclusions.

Conclusion

Patients on DAPT should be managed as follows:

1. Assess medical status (ASA classification).
2. Perform lab tests (bleeding/clotting time, RBS if diabetic).
3. Stratify surgical risk and ensure strong local bleeding control.
4. Provide extended post-op monitoring.

Our results indicate that dental extractions can be safely performed without stopping DAPT. Bleeding was effectively controlled with pressure gauze, TXA, and sutures. No patients required transfusion. Thus, therapy discontinuation appears unnecessary for minor oral surgeries, but further research with larger cohorts is essential to confirm these protocols.

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