

Assessment of Postoperative Bleeding after Dental Extractions in Patients Who Are On Antiplatelet Therapy: A Prospective Study

Md. Mahbul Hoda, Romir Navaneetham, M. E. Sham, Suresh Menon, Veerendra Kumar, S. Archana
Department of Oral and Maxillofacial Surgery, Vydehi Institute of Dental Sciences, Bengaluru, Karnataka, India

Abstract

Introduction: Patients with ischemic heart disease are placed on antiplatelet therapy (APT). This study allows a definite protocol to be set which will allow us to make the right judgment when it comes to extractions in patients on APT. **Materials and Methods:** For this study, 100 patients were taken up for dental extraction after obtaining a thorough case history. Bleeding time was assessed preoperatively for all the patients and patients with normal bleeding time were taken up for surgery under local anesthesia. Local haemostatic measures were employed after the extraction. Patients were monitored for first 30 minutes at the clinic and a telephonic review of all the patients was done at 24 h–48 h interval after the procedure. If there was an active ooze from the surgical site at any point, haemostatic measures with local haemostatic agents were carried out. **Results:** In patients with mono antiplatelet therapy, bleeding was noted in 16 patients after the 1 h time interval and was absent after 24h–48 h time intervals. The $q = 32$ and the $P < 0.001$, making it statistically significant. Regarding patients on dual APT, bleeding was noted in ten patients after 1 h, and in one patient after 24 h with no patients presenting with bleeding at the 48 h time interval. The $q = 16.545$ and $P < 0.001$, making it statistically significant. **Discussion:** The benefits of continuing APT for patients who require dental extraction outweighs the risks of postoperative bleeding. **Conclusion:** Antiplatelets are used for the prevention of myocardial infarction, ischemic stroke, and vascular death among patients who are at high risk of these events. Antiplatelets have minimal impact on the amount and duration of bleeding following routine dental extractions.

Keywords: Antiplatelet therapy, bleeding time, dental extraction

INTRODUCTION

Antiplatelet drugs are used to treat and prevent a wide range of cardiovascular diseases and cerebrovascular accidents.^[1] These drugs are most commonly indicated in case of arterial thrombosis, ischemic heart disease, previous myocardial infarction, coronary artery bypass surgery, placement of stent, nonhaemorrhagic stroke, transient ischemic attacks, and peripheral arterial disease.^[2]

Thrombotic and thromboembolic occlusion of blood vessels is the main cause of ischemic events in heart, lungs, and brain. The thrombi occluding artery are rich in platelets. The antiplatelet drugs have been extensively developed as potential therapies for the prevention and management of arterial thrombosis.^[3]

When a patient on antiplatelet therapy (APT) needs to undergo minor oral surgical procedure, the surgeon is often confronted

with a choice of interrupting the therapy, which increases the risk of thrombosis or on continuing the medication which increases the risk of haemorrhage.^[4]

The most commonly used antiplatelet drugs include aspirin and clopidogrel. Antiplatelet drugs inhibit platelet activation pathways. Acetylsalicylic acid (aspirin) is a cyclooxygenase (COX1) inhibitor. It affects thromboxane A₂ synthesis to achieve a persistent and almost complete

Address for correspondence: Dr. Romir Navaneetham,
#11, Cornwell Road, Langford Gardens, Bengaluru - 560 025,
Karnataka, India.
E-mail: romir.is.navaneetham@gmail.com

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suppression of platelets COX1 for more than 24 h. The usual dose ranges from 85 to 325 mg/day. Clopidogrel has an active metabolite that selectively inhibits the binding of adenosine di phosphate (ADP) to its platelet P2Y12 receptor and the subsequent ADP-mediated activation of the glycoprotein 2b/3a complex, thus inhibiting the platelet aggregation. The usual dose is 75 mg/day.^[5]

The oral surgical management of patient on APT is still being debated with some clinicians preferring to follow the routine practice to stop the drug, while others prefer the continuation of drugs during minor oral surgery such as tooth extraction.^[6] However, previous studies have shown a low number of complications associated with minor oral surgical procedure without interruption of antiplatelet drugs.^[7]

MATERIALS AND METHODS

This prospective study was conducted at our institute from January 2016 to January 2018. A 100 patients on APT who reported to the Department of Oral and Maxillofacial Surgery for dental extraction procedure were included in the study. Informed consent was taken from all patients.

Inclusion criteria

- Patients on regular APT who reported for dental extraction
- Medically compromised patients who were fit for extractions under local anesthesia.

Exclusion criteria

- Patients who have discontinued APT
- Bleeding time of the patients above normal values
- Patients with confounding variables such as on medications which alter the action of the antiplatelet drugs and patients who were known cases of liver disease.

Institutional Review Board Ethical Clearance Number: VIDS/ACM/116/2016.

Methodology

Patients were taken up for surgery after thorough case history which included age, gender, and medical condition, for which the APT was prescribed, name of antiplatelet drug, and dose. Bleeding time (Dukes method) was assessed preoperatively for all the patients. Patients with normal bleeding time between 2 and 5 min were taken up for surgery.

The procedure of extraction was carried out under local anesthesia. Local haemostatic measures were employed after the extraction. Patients were monitored for first 30 min at the clinic and a telephonic review of all the patients was done at 24 h–48 h interval after the procedure. After 30 min, if there was an active ooze from the surgical site, haemostatic measures with the help of local haemostatic agents (oxidized cellulose/Gelfoam pack/bone wax) were carried out. On telephonic

interview after 24 h, in case of any ooze, patients were recalled for local intervention. The data collected were statistically analyzed with the Chi-square test and a result of $P < 0.001$ was considered statistically significant.

RESULTS

A total of 100 patients in the various age groups were evaluated of whom 82% of patients were male and 18% of patients were female. Two percent of the patients were in the age group of 25–35 years. Twelve percent patients were in 36–45 years. Twenty seven percent of the patients were in the age group of 46–55 years. Forty one percent of the patients 56–65 years of age. Eighteen percent of the patients were in the age group of 66–75 years. The mean age of the patients was 56.3 years with a standard deviation of 10 years.

Of the 100 patients, 78% of the patients were on monodrug therapy which comprised acetylsalicylic acid with dosages varying from 85 mg/day to 325 mg/day and 22% of the patients were on dual drug therapy of acetylsalicylic acid of dosage between 85 and 325 mg/day along with clopidogrel 75 mg/day [Table 1].

Postoperative bleeding in mono APT at 1 h was present in 16 (20.5%) patients and was absent in 62 (79.5%) patients. At interval of 24 h–48 h, none of the patients on mono APT had exhibited postoperative bleeding. Postoperative bleeding in dual APT (DAPT) at 1 h was present in 10 (45.5%) patients and was absent in 12 (54.5%) patients. At an interval of 1 day, only one patient (4.5%) exhibited bleeding. At the interval of 48 h, not one of the patients on dual antiplatelet had any signs of bleeding [Table 2].

Chi-square test and Cochran's Q -test were used to statistically analyze the results of this study. Comparison of the presence

Table 1: Distribution of subjects based on the type of Antiplatelet therapy administered

Variables	AP Therapy	n	%
AP Drugs	Mono	78	78%
	Dual	22	22%

Table 2: Comparison of presence of Bleeding at different time intervals between subjects with Mono & Dual Antiplatelet Therapy

Time	Bleeding	Mono AP Therapy		Dual AP Therapy		χ^2	P
		n	%	n	%		
11 h	Present	16	20.5%	10	45.5%	5.548	0.02*
	Absent	62	79.5%	12	54.5%		
24 h	Present	0	0%	1	4.5%	3.581	0.06
	Absent	78	100%	21	95.5%		
48 h	Present	0	0%	0	0.00%		
	Absent	78	100%	22	100%		

of bleeding at different time intervals with subjects on mono and DAPT was analyzed.

On statistical analysis with Chi-square test, it 2 values at 1 h is 5.548 and at 24 h postoperative is 3.581. The *P* value being 0.02 at 1 hour interval and 0.06 at the 24hr interval.

Cochran's *Q*-test deduced that, in patients with mono antiplatelet therapy, bleeding was noted in 16 patients after the 1 h time interval and was absent after 24 h–48 h time intervals. It was statistically significant as $q=32$ and $P<0.001$. Patients on DAPT, bleeding was noted in 10 patients after 1 h and in one patient after 24 h with no patients presenting with bleeding at the 48 h time interval. The *q* value was 16.545 and $P<0.001$, making it statistically significant [Table 2].

DISCUSSION

Drugs that inhibit platelet function have assumed increased importance in the care of patients with cardiovascular and cerebrovascular diseases, which are leading causes of death worldwide.^[8]

Oral and maxillofacial surgeons are coming across patients with chronic medical illness. Among these patients are those that are being treated with antiplatelet drugs to prevent arterial thrombosis.^[9] A major concern in the management of patients taking antiplatelet drugs is the potential for excessive bleeding after extraction of the teeth.

Aspirin remains the most studied, most clinically effective, most widely used, and the least expensive antiplatelet agent currently available. Aspirin exerts its antiplatelet effect by acetylation of the endoperoxides COX1 irreversibly within minutes of ingestion of low dose of the drug.^[10] Hence, platelet function will be inhibited for the life of platelet which is normally around 10 days.

In our study, extractions were done on 100 patients who were on antiplatelet drugs without any interruption of medication. Our main objective was to assess the postoperative bleeding on patients after extraction. In case any bleeding occurred from extraction socket, local haemostatic measures were used to achieve primary haemostasis such as suturing of extraction socket and placement of a Gelfoam in the extraction socket. We observed that any postextraction bleeding can be easily controlled by local haemostasis measures.

Among 100 patients who were on antiplatelet drugs, only 27 patients had bleeding from extraction socket, which was controlled by local haemostatic measures. Only one patient had a history of bleeding after 2 h of extraction, the patient immediately reported back to outpatient department (OPD) where Gelfoam was placed, and suturing was done in extraction socket and haemostasis was achieved. After that, the patient was completely fine and there was no history of bleeding after 24–48 h, respectively. Bleeding from extraction socket after 24 h was seen only in one patient who reported back to OPD next day morning.

A trial was conducted on 155 patients who underwent dental extractions and were receiving APT by Cardona-Tortajada *et al.* The patients were requested not to interrupt the medications and local measures were taken to control the potential haemorrhage. This study reported no major haemorrhagic events and only two patients had bleeding after extraction, one after 2 h postextraction and another after 24 h postextraction, respectively,^[11] which were controlled by local measures.

After assessing 200 patients aged between 50 and 65 years who were indicated for dental extraction, patients were randomly divided into aspirin continuing group (Group A) and aspirin discontinuing group (Group B).^[11] The results showed that, in both the groups, bleeding time and clotting time remained within the normal limits.

Another study included a total of 51 patients undergoing minor oral surgical procedures who were on long-term low-dose aspirin therapy regimens (acetylsalicylic acid 75 mg–100 mg/day). Investigations such as bleeding time and platelet count were performed. If within normal limits, aspirin was not stopped, and surgery was performed under LA (Local Anaesthesia). All wounds were sutured and followed up at 24, 48, 72 h, 1 week, and 2 weeks after the procedure.^[12] The conclusion was that most minor oral surgical procedures can be carried out safely without stopping long-term low-dose aspirin regimen.

Another study included 546 patients who were on aspirin or clopidogrel and on both aspirin and clopidogrel (dual therapy) and 575 healthy individuals. They did the study on association between APT and prolonged, immediate postoperative and found that risk of prolonged bleeding in the immediate postoperative period was higher with patient on dual therapy.^[13]

In a retrospective study, dental records of 222 patients were obtained. One hundred and sixty-eight patients had one or more teeth extracted, and 54 patients underwent other minor oral surgical procedures. Sixty patients received DAPT. The overall frequency of postoperative bleeding was 4.9%. The frequencies of postoperative bleeding in the aspirin, clopidogrel, ticagrelor, and DAPT groups were 3.2%, 4.5%, 5.9%, and 8.3%, respectively.^[14] None of the patients experienced prolonged bleeding.

Another study included the management of dental extraction in patients on warfarin and APT. Of the 1331 patients in the study, (1) 60 were on warfarin with intentional normalized ratio (INR) below 4.0 (warfarin continued: 28 patients/33 occasions; warfarin stopped and switched to heparin under hospitalization: 32 patients/37 occasions); (2) 183 on APT (aspirin: 125 patients/185 occasions; clopidogrel: 42 patients/65 occasions; dual therapy: 16 patients/24 occasions); and (3) a control group of 1088 patients/1472 occasions without any antithrombotic therapy.^[15] The study indicated that there is no need to interrupt warfarin (INR <4.0) and APT before dental extractions.

A systematic review was done to evaluate bleeding with minor oral surgery in patients on DAPT, single APT (SAPT), or no APT by Ockerman *et al.* The PubMed, Embase, Web of Science, and Cochrane Library databases were screened. Sixteen studies were included. DAPT was continued in all studies. The perioperative bleeding risk was significantly higher for DAPT than for SAPT but not higher compared to no APT. The postoperative bleeding risk was significantly elevated for DAPT compared to SAPT and no APT, but only by 1% and 1%, respectively.^[16] Clinically, this may be considered quite similar. In addition, local haemostatic measures could control all reported bleeding and no lethal events occurred. Therefore, DAPT interruption is not advised before minor oral surgery.

In a systematic review on the dental management of patients under antiplatelet treatment, they concluded that the current trend is to maintain the treatment during the surgical procedure, assuring a good control of the haemorrhage with local haemostatic measures.^[17]

A new class of oral anticoagulants has recently been introduced for the treatment and prevention of thromboembolism. Currently, dabigatran (Pradaxa), apixaban (Eliquis), and rivaroxaban (Xarelto) are available. To date, one major disadvantage of the new drugs compared to warfarin has been the lack of a reversal agent to help deal with uncontrollable bleeding. This has recently changed with the approval of idarucizumab, a humanized monoclonal antibody against dabigatran.^[18] Parenteral idarucizumab can be given when rapid reversal of dabigatran is required for emergency surgery or urgent procedures, or for life-threatening or uncontrolled bleeding. Antidotes for the other new drugs are not yet available.

NOACs are novel direct-acting medications that are selective for one specific coagulation factor, either thrombin (II a), or activated factor X (X a). Several Vitamin K antagonist (VKA) Newer oral anticoagulants (NOACs), such as dabigatran (a direct inhibitor of FII a) and rivaroxaban, apixaban, and edoxaban (direct inhibitors of factor X a), have been used for at least 5 years but possibly 10 years. Unlike traditional VKA, which prevent the coagulation process by suppressing the synthesis of vitamin K-dependent factors, NOACs directly inhibit key proteases (factors II a and X a). The important indications of these drugs are the prevention and treatment of deep vein thrombosis and pulmonary embolisms, and the prevention of atherothrombotic events in the heart and brain of patients with acute coronary syndrome and atrial fibrillation. Their dosage isn't fixed and various dosages are available for purchase.^[19] Most studies have reported more advantages than disadvantages for NOACs when compared with VKAs, with the most important advantages of NOACs including safety issues (i.e., a lower incidence of major bleeding), convenience of use, minor drug and food interactions, a wide therapeutic window, and no need for laboratory monitoring.

A study was conducted to evaluate the need for stoppage of DAPT in patients undergoing dental extractions by Babaji and Rishal. One hundred and fifty patients indicated for dental extraction were grouped as Group I consisted of 75 patients on DAPT and Group II consisted of 75 patients who have discontinued APT 1 week before dental extraction. Before treatment (BT) of all the participants was recorded before extraction procedures. Under local anesthesia, single molar tooth indicated for simple extraction was done in both the groups. Suturing along with pressure pack was done after extraction. BT after extraction was statistically checked between the groups after 1–24 h. Postoperatively, none of the patients in both the groups showed active bleeding 1–24 h.^[20] No bleeding was seen in 73 patients in Group I and 78 patients in Group II after 24 h.

This study concludes that low-dose aspirin therapy need not be stopped, before extraction procedures. Local haemostasis is sufficient to control bleeding. Antiplatelets have minimal impact on the amount and duration of bleeding following routine dental extractions. The benefits of the use of antiplatelet drugs by patients outweigh the risk of postoperative bleeding. With the advent of new antiplatelet regimens, it is necessary that they are studied and their risks in dental extraction procedure are to be assessed which is a limitation of this study.

CONCLUSION

Antiplatelets are used for the prevention of myocardial infarction, ischemic stroke, and vascular death among patients who are at high risk of these events. Antiplatelets have minimal impact on the amount and duration of bleeding following routine dental extractions. The benefits of use of antiplatelet drugs by patients outweigh the risk of postoperative bleeding.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Cardona-Tortajada F, Sainz-Gómez E, Figuerido-Garmendia J, de Robles-Adsuar AL, Morte-Casabó A, Giner-Muñoz F, *et al.* Dental extractions in patients on antiplatelet therapy. A study conducted by the Oral Health Department of the Navarre Health Service (Spain). *Med Oral Patol Oral Cir Bucal* 2009;14:e588-92.
- Bajkin BV, Urosevic IM, Stankov KM, Petrovic BB, Bajkin IA. Dental extractions and risk of bleeding in patients taking single and dual antiplatelet treatment. *Br J Oral Maxillofac Surg* 2015;53:39-43.
- Dézi BB, Koritsánszky L, Braunitzer G, Hangyási DB, Dézi CA. Prasugrel versus clopidogrel: A comparative examination of local bleeding after dental extraction in patients receiving dual antiplatelet therapy. *J Oral Maxillofac Surg* 2015;73:1894-900.
- George Varghese K, Manoharan S, Sadhanandan M. Evaluation of bleeding following dental extraction in patients on long-term antiplatelet therapy: A clinical trial. *Indian J Dent Res* 2015;26:252-5.
- Carrizo A, Carrasco D. Oral surgery in patients under antithrombotic therapy: Narrative review. *J Oral Res* 2015;4:58-64.
- John WE. Antiplatelet drugs: A literature review. *J Chest Physicians* 2012;141:89-119.

7. Sadeghi-Ghahrody M, Yousefi-Malekshah SH, Karimi-Sari H, Yazdanpanah H, Rezaee-Zavareh MS, Yavarahmadi M. Bleeding after tooth extraction in patients taking aspirin and clopidogrel (Plavix®) compared with healthy controls. *Br J Oral Maxillofac Surg* 2016;54:568-72.
8. Omar HR, Socias SM, Powless RA, Sprenger C, Karlinski R, Mangar D, *et al.* Clopidogrel is not associated with increased bleeding complications after full-mouth extraction: A retrospective study. *J Am Dent Assoc* 2015;146:303-9.
9. Palta S, Saroa R, Palta A. Overview of the coagulation system. *Indian J Anaesth* 2014;58:515-23.
10. Dinkova A, Kirova DG, Delev D. Dental management and bleeding complications of patients on long-term oral antiplatelet therapy. Review of existing studies and guidelines. *J IMAB* 2013;19:298-304.
11. Darawade DA, Kumar S, Desai K, Hasan B, Mansata AV. Influence of aspirin on post-extraction bleeding – A clinical study. *J Int Soc Prev Community Dent* 2014;4:S63-7.
12. Madan GA, Madan SG, Madan G, Madan AD. Minor oral surgery without stopping daily low-dose aspirin therapy: A study of 51 patients. *J Oral Maxillofac Surg* 2005;63:1262-5.
13. Girotra C, Padhye M, Mandlik G, Dabir A, Gite M, Dhonnar R, *et al.* Assessment of the risk of haemorrhage and its control following minor oral surgical procedures in patients on anti-platelet therapy: A prospective study. *Int J Oral Maxillofac Surg* 2014;43:99-106.
14. Doganay O, Atalay B, Karadag E, Aga U, Tugrul M. Bleeding frequency of patients taking ticagrelor, aspirin, clopidogrel, and dual antiplatelet therapy after tooth extraction and minor oral surgery. *J Am Dent Assoc* 2018;149:132-8.
15. Lu SY, Lin LH, Hsue SS. Management of dental extractions in patients on warfarin and antiplatelet therapy. *J Formos Med Assoc* 2018;117:979-86.
16. Ockerman A, Bornstein MM, Leung YY, Li SKY, Politis C, Jacobs R. Incidence of bleeding after minor oral surgery in patients on dual antiplatelet therapy: A systematic review and meta-analysis. *Int J Oral Maxillofac Surg* 2020;49:90-8.
17. Sáez-Alcaide LM, Sola-Martín C, Molinero-Mourelle P, Paredes-Rodríguez V, Zarrias-Caballero C, Hernández-Vallejo G. Dental management in patients with antiplatelet therapy: A systematic review. *J Clin Exp Dent* 2017;9:e1044-50.
18. Daly C. Treating patients on new anticoagulant drugs. *Aust Prescr* 2016;39:205-7.
19. Mekaj YH, Mekaj AY, Duci SB, Miftari EI. New oral anticoagulants: Their advantages and disadvantages compared with vitamin K antagonists in the prevention and treatment of patients with thromboembolic events. *Ther Clin Risk Manag* 2015;11:967-77.
20. Babaji P, Rishal Y. Clinical evaluation of role of dual antiplatelet therapy on bleeding after dental extraction. *Contemp Clin Dent* 2018;9:41-4.