



Assessment of Bleeding in Patients on Antiplatelets Undergoing Dental Implants

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Abstract

Introduction Antiplatelet drugs are used for the secondary prevention of cardiac and cerebrovascular diseases. Clopidogrel and Aspirin are the most commonly prescribed drugs for these patients. Physicians and dentists have to weigh bleeding risks versus thrombotic risks in interrupting antiplatelet regimen. The balance of these risks for an individual patient is the primary consideration in management of dental patients who are taking antiplatelet drugs and require dental implants. The study was undertaken to assess the risk of bleeding in patients on single and dual antiplatelets undergoing dental implants.

Materials and method 65 patients were assessed for bleeding after placement of dental implants. They were divided into 2 groups: group I included 48 patients on single antiplatelets (Aspirin) and group II included 17 patients on dual antiplatelets (Aspirin and Clopidogrel)

based upon the timing of coronary intervention. Bleeding was evaluated intra-operatively and post-operatively.

Results Significant difference in bleeding was noted between group I and group II based on the Visual Analog Scale (VAS) for bleeding severity after implant placement both intra-operatively ($P = 0.000$) and post-operatively ($P = 0.004$) within 24 h. However, post-operative complication after 24 h was non-significant ($P = 0.277$).

Conclusion Dental implants can be safely placed in patients on single antiplatelet drugs without discontinuing them. In patients on dual antiplatelets, risk of bleeding is mild to moderate if the drugs are continued. Consultation with treating cardiologist is a must before any kind of dental invasive surgery in patients on antiplatelets.

Keywords Bleeding · Antiplatelets · Dental implants · Hemostatic measures

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Introduction

Antiplatelet drugs are used for the secondary prevention of cardiac and cerebrovascular diseases, especially in patients with ischaemic heart disease, a history of coronary artery bypass, previous myocardial infarction, placement of a stent, non-hemorrhagic stroke, peripheral arterial disease. Clopidogrel and Aspirin are the most commonly prescribed antiplatelet drugs for these patients [1]. These drugs interfere with platelet aggregation by reversibly or irreversibly inhibiting various steps in platelet activation required for primary hemostasis.

In patients on antiplatelet medications undergoing dental surgery, peri-operative and post-operative management represents a clinical problem. Physicians and dentists have to weigh bleeding risks versus thrombotic risks in

interrupting antiplatelet regimen. According to The American Heart Association, American College of Cardiology, Society for Cardiovascular Angiography and Interventions, American College of Surgeons, and American Dental Association, single or dual antiplatelet therapy should not be interrupted for dental procedures. These guidelines suggest, “Given the relative ease with which the incidence and severity of oral bleeding can be reduced with local measures during surgery (eg, absorbable gelatine sponge and sutures) and unlikely occurrence of bleeding once an initial clot has formed, there is little or no indication to interrupt antiplatelet drugs for dental procedures.” [2] Despite these guidelines, doctors adopt a totally different approach in their practices because of the fear of oral bleed, the same has been depicted in previous studies done on clinical practices and perceptions [3,4].

The balance of these risks for an individual patient is the primary consideration in management of patients who are taking antiplatelet drugs and require dental implants. The use of dental implants has become a routine management strategy for replacing missing teeth either partial or complete loss of teeth. Patients who undergo implant therapy face medical and surgical risks that are similar to those of outpatient oral surgical intraosseous procedures [5]

According to the SCDEP (Scottish Dental Clinical Effectiveness Program), dental implants are placed under high risk bleeding risk procedure (Table 1) [6]. A literature review yielded few well designed prospective clinical studies identifying post-operative bleeding and complications after dental implant surgeries in patients using antiplatelet medications [7] Therefore, this study was undertaken to assess the risk of bleeding in patients on single and dual antiplatelets undergoing dental implant procedure in the hospital setting.

Materials and method

The prospective clinical study took place from February 2017 to December 2019. All patients were provided written informed consent, and the study was approved by the Local Ethics Committee. The sample was derived from the population of patients presenting to the Outpatient Department of Dentistry, Dayanand Medical College & Hospital and Hero DMC Heart Institute, Ludhiana.

The total sample size was of 69 patients. Out of them, 48 patients were on Aspirin, 17 patients on Clopidogrel, 3 patients on Prasugrel and 1 patient on Ticagrelor. Only

Table 1 Post-operative bleeding risks for dental procedures

Dental Procedures that are unlikely to cause bleeding	Dental procedures that are likely to cause bleeding	
	Low risk of post-operative bleeding complications	Higher risk of post operative bleeding complications and low risk of post operative bleeding complications are subtable of dental procedures that are likely to cause bleeding
Local anesthesia by infiltration, intraligamentary or mental nerve block	Simple extractions (1-3 teeth, with restricted wound size	Complex extractions , adjacent extractions that will cause a large wound or more than 3 extractions at once
	Incision and drainage of intraoral swellings	Flap raising procedures
Local anesthesia by inferior dental block other regional nerve blocks	Detailed six point full periodontal examination	Elective surgical extractions
Basic periodontal examination (BPE)	Root surface instrumentation (RSI) and subgingival scaling	Periodontal surgery
Supragingival removal of plaque, calculus and stain	Direct or indirect restorations with subgingival margins	Preprosthetic surgery
Direct or indirect restorations with supragingival margins		Periradicular surgery
Endotonics - orthograde		Crown Lengthening
Impressions and other prosthetic procedures		Dental implant surgery
Fitting and adjustment of orthodontic appliances		Gingival recontouring
		Biopsies

Management of Dental Patients taking Anticoagulants or Antiplatelet Drugs

Source: Scottish Dental Clinical Effectiveness Program (SCDEP)

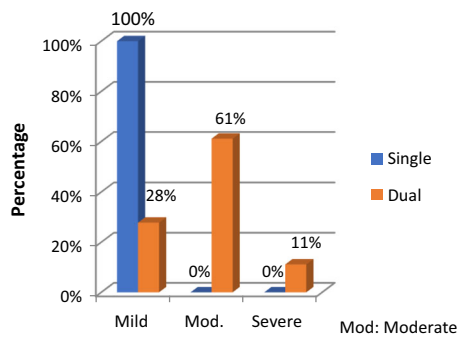


Fig. 1 Intra-operative bleeding

patients on Aspirin and Clopidogrel were included in the study due to a larger sample size. 65 patients were taken for dental implant surgery. They were divided into 2 groups according to the usage of antiplatelet drugs based upon the timing of coronary intervention. Group I comprised 48 patients on single antiplatelets (Aspirin 75 mg/day or 150 mg/day), dental implants were placed without any alteration of antiplatelet dosage. Group II comprised 17 patients on dual antiplatelets (Aspirin and Clopidogrel) and were asked to continue. None of the patients were asked to stop or modify the drugs. This was done in consultation with the treating cardiologist and decided according to the patient's cardiac presentation. The complications and risks were explained to the patients regarding the stoppage and continuation of antiplatelets.

Basic investigations (Routine Haemogram, Random Blood sugar) were done as per the clinical judgment of the cardiologist. All clearances were taken from the concerned cardiologist. Although the Ivy bleeding time has been used to assess platelet function, it is not suitable for estimating the hemorrhagic risk of a patient taking antiplatelet medication. Patients taking aspirin or other platelet-inhibiting drugs may have prolonged bleeding times, although these may not be clinically relevant for procedures such as the removal of one or two teeth, the placement of implants, or other minor procedures, as post-operative bleeding can be controlled using local measures.

Dental implant placement was done in the Department of Dentistry, DMC&H by an oral-maxillofacial surgeon with minimal flap elevation technique.

Surgical procedure

A midcrestal incision was made on the residual alveolar ridges without any releasing incisions. Full thickness mucoperiosteal flap was elevated, and osteotomy was prepared as per the drilling protocols suggested by the implant company. One to five number of implants were placed as per the treatment plan for the patients. All implants were a single stage implant. A 3–0 vicryl was

used to close the flap. Coagulant substitute was used in some patients. Patients were advised to use cold compresses and call the surgeon if they had severe bleeding (VAS 7–10). All the cases were done by the same surgeon. Post-operatively, patients were advised to take analgesic (Paracetamol 650 mg thrice a day) for the management of pain along with antibiotics (Amoxicillin/Clavulanic Acid 625 mg thrice a day for 5 days).

Bleeding was evaluated using a Visual Analog Scale (VAS) intra-operatively & post-operatively for 24 h.

Initially, the patients were asked to wait in the recovery area after implant placement for 1 h. After 1 h, they were reassessed for oral bleeding by the resident. Within 24 h, they were contacted on the telephone to know the bleeding status. After 24, 1 patient reported back with severe bleeding and resuturing was done.

A Score of 1–3 indicated mild bleeding (patient needs to place a wet gauze on the surgical site), a score of 4–6 indicated moderate bleeding (sutures and use of hemostatic agent), and a score of 7–10 indicated severe bleeding (patient needs to return to clinic for resuturing). We used Gelfoam, the most common absorbable gelatin sponge as a hemostatic agent.

All the patients were looked for complications in the form of intra-operative bleed, post-operative complications including re-procedure, hematoma, and need for blood transfusion. Patients were given a list of post-operative instructions (Appendix) and telephone numbers of the resident and oral-surgeon who could be contacted in case of post-operative bleed.

Statistical analysis

Data have been described in terms of range; mean $\pm$ standard deviation ($\pm$ SD), frequencies (number of cases), and relative frequencies (percentages) as appropriate. Comparison of quantitative variables between the groups has been done using Student t-test. For comparing categorical data, Chi square (χ^2) test was performed, and exact test was used when the expected frequency was less than 5. A probability value (p value) less than 0.05 has been considered statistically significant. All statistical calculations have been done using SPSS (Statistical Package for the Social Science) SPSS 21 version statistical program for Microsoft Windows.

Results

65 patients were studied in two groups (47 patients in group I and 18 patients in group II). Group I comprised patients on single antiplatelets (Aspirin) and group II comprised patients on dual antiplatelets (Aspirin and

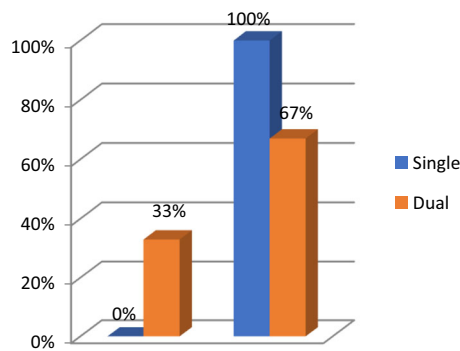


Fig. 2 Post-operative bleeding within 24 h

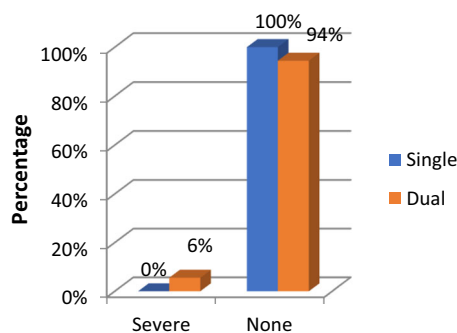


Fig. 3 Post-operative bleeding after 24 h

Clopidogrel). The mean age of the patients in group I was 60.89 ± 6.03 and in group II was 63.00 ± 6.09 . In group I, males: 31 (66%) were more as compared to females: 16 (34%). In group II, males: 12 (67%) were more as compared to females: 6 (33%). Number of implants placed varied from 1 to 5 in both groups with the mean of 2.45 in single antiplatelets and 2.72 in dual antiplatelets.

It was observed that after giving intraoral local anesthesia, no bleeding was seen in group I whereas mild bleeding was seen in 2 (11%) cases in group II.

Intra-operatively, mild bleeding was observed in group I in all the patients on single antiplatelets. In group II, mild bleeding was seen in 5 (28%) cases, moderate bleeding was observed in 11 (61%) cases, and severe bleeding was seen in 2 (11%) cases. The results were statistically significant in case of intra-operative bleed ($P = 0.000$).

Within 24 h, no post-operative complication was seen in group I. In group II, mild ooze was seen in 33% of cases. On cross examination, the patients (6%) told that they had been spitting. These results were also statistically significant ($P = 0.004$).

No post-operative complication was seen in Group I after 24 h whereas in group II, severe bleeding was seen in

1 (6%) case. These results were statistically non-significant ($P = 0.277$).

Significant difference in bleeding was noted between group I and group II based on the Visual Analog Scale (VAS) for bleeding severity after implant placement both intra-operatively and post-operatively within 24 h. However, post-operative complication after 24 h was non-significant.

Discussion

The decision to continue or stop antiplatelets before invasive dental surgery is a challenging decision for the dentist because of the associated risk of bleeding. Studies of patients with coronary artery disease and at risk of ischaemic stroke have shown that ASA withdrawal seriously increases the risk of adverse cardiac and brain ischaemic events [8,9]. In this study, we found that in patients on continued single antiplatelets (Aspirin), the frequency of oral bleeding complications after dental implant placement is low to negligible. However, in patients who continued with dual antiplatelets (Aspirin and Clopidogrel), mild to moderate bleeding was seen in majority of patients, whereas, severe bleeding was seen in 11% of cases. Grobe et al. in their study found that minor oral surgery can be done safely with continued single or dual antiplatelets [10].

Complete assessment of the patient should be done regarding intra-operative and post-operative hemorrhage. The risk of moderate to severe bleeding induced by dental procedure is less than 1% for the average patient [11]. While this risk increases with the patient on antiplatelet medication, nearly all scenarios of excessive bleeding can be adequately managed with relatively simple local measures such as positive pressure (absorbent gauze), suturing and haemostatic packing material (eg., oxidized cellulose, gelatine sponge) [12]. Positive pressure aids hemostasis by promoting occlusion of the site of injury and providing mechanical aid to clot formation. Suturing wound margins helps in applying compressive force to the bleeding areas [13]. Gelfoam aids in hemostasis by providing a simple occlusive matrix and through contact activation of the intrinsic pathway [14]. In nearly all patients involved with previous studies, hemorrhaging was easily controlled with local measures and also by following instructions in the post-surgical period. These findings have been corroborated in our study also, in which we found that patients on dual antiplatelets who had moderate bleeding were controlled by suturing and packing of Gelfoam. In a patient who had severe bleeding, it was controlled by resuturing. No hospitalization was required.

The treatment should be planned early in the day and week to allow time for the management of prolonged bleeding or rebleeding episodes. The procedure should be performed as atraumatically as possible, local hemostatic measures should be used appropriately. The patient should be discharged once hemostasis has been achieved and should be advised to take Paracetamol, unless contraindicated, for pain relief and to avoid NSAIDS.

The findings of the present study in patients taking antiplatelet drugs, such as Aspirin and Clopidogrel, who developed complications during implant surgeries were in line with currently accepted protocols [15,16]. In patients who are continuing with dual antiplatelets, the treatment strategies should be planned only after recommendation with treating cardiologist, since the risk of frequency of oral bleed complication is much more. According to this study, dental implant surgeries can be performed safely in an institutional setup but with certain precautions. Further studies are required to assess the bleeding in patients taking newer anti platelet medications like Prasugrel and Ticagrelor.

Conclusion

In summary, dental implants can be safely placed in patients on single antiplatelet drugs without discontinuing them. In patients on dual antiplatelets, risk of bleeding is mild to moderate if the drugs are continued, but at the same time it can be managed with local hemostatic measures such as packing with gelfoam and suturing. Consultation with treating cardiologist is a must before any kind of dental surgery in patients on dual antiplatelet drugs.

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Compliance with ethical standards

Conflict of interest There is no conflicts of interest.

Appendix 1 Post-operative instructions in vernacular language and english

Post-operative instructions:

- Remove pressure pack after 1 h
- Don't spit for 24 h
- Take soft and cold diet for 24 h, example ice cream, cold milk, curd, lassi, Custard, etc.
- No aerated drinks
- Don't apply any hot pack from outside

- Ice pack to be applied
- After 24 h, start warm saline Rinse (salt water) 3–4 times a day for a week.

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