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Dental extraction without stopping single or dual antiplatelet therapy: results of a retrospective cohort study

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Abstract. The aim of this study was to investigate the incidence of bleeding after dental extraction without stopping antiplatelet therapy. Postoperative bleeding was assessed in a total of 1271 patients who were divided into two groups: a study group comprising 183 patients on antiplatelet therapy (aspirin 125 patients/185 occasions; clopidogrel 42 patients/65 occasions; dual therapy 16 patients/24 occasions) who underwent 548 dental extractions on 274 occasions, and a control group comprising 1088 patients who were not receiving any antiplatelet or anticoagulant therapy and underwent 2487 dental extractions on 1472 occasions. The incidence of postoperative bleeding was higher in the study group (5/274, 1.8%) than in the control group (10/1472, 0.7%), and also in the dual antiplatelet subgroup (1/24, 4.2%) than in the single antiplatelet subgroups (clopidogrel: 2/65, 3.1%; aspirin: 2/185, 1.1%); however, these differences were not significant. Postoperative bleeding was managed successfully by repacking with Gelfoam impregnated with tranexamic acid powder in 12 patients and by resuturing in three of the control patients undergoing extraction of impacted teeth with flap elevation. These findings indicate that there is no need to interrupt antiplatelet drugs before dental extraction.

Key words: extraction; antiplatelet; aspirin; clopidogrel.

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It is not uncommon for physicians and dentists to routinely stop a patient's antiplatelet therapy for 7 to 10 days, or for at least 3 days, prior to dental extraction in order to avoid the risk of bleeding. However, the interruption of antiplatelet therapy is associated with a progressive recovery of platelet function and the potential risk of a rebound of thrombotic arterial events.[1] Excessive thromboxane A_2 activity and decreased fibrinolysis have been noted following aspirin interruption, thereby exposing the patient to a higher risk of recurrent thrombosis, stroke, myocardial infarction (MI), or other coronary event.[2] Although the risk is small, it outweighs the risk of oral bleeding.[3,4] Clinically, the present researchers have witnessed two strokes occurring in two Chinese female patients with hypertension and diabetes who had been taking aspirin for the prevention of cardiovascular disease (CVD). Both had been instructed to stop taking aspirin 7 days before a single dental extraction procedure at a dental clinic and experienced cerebrovascular events 2 days later. The chronological link between aspirin withdrawal and

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the acute thromboembolic events may not have been a matter of chance.

Antiplatelet therapy has been reported to have reduced the overall mortality from vascular disease by 15% and non-fatal vascular complications by 30%.[1] Low-dose aspirin remains the cornerstone of oral antiplatelet therapy. Prophylactic aspirin use in the USA has been estimated at 33% in high-risk individuals (e.g., those with coronary artery disease (CAD), MI, stroke, or peripheral vascular disease), 16% in those with multiple CVD risk factors, and 12–49% in those with diabetes.[5] Diabetes is a complex metabolic disease with increased macrovascular and microvascular complications, which are responsible for 65% of deaths in patients with type 2 diabetes.[6] Atrial fibrillation (AF) is the most common sustained arrhythmia. Among patients with AF, the annual rate of stroke without any preventive treatment is approximately 5%, 2- to 7-fold higher than the rate in those with sinus rhythm.[7] Such cardioembolic strokes are often fatal or severely disabling. Stroke prevention in AF requires the use of oral anticoagulants (OAC), with antiplatelet therapy only having a weak efficacy.[7] The OAC warfarin has been the primary therapy for stroke prevention in AF due to its efficacy in therapeutic range, convenience of once-daily dosing, and relatively low cost. However, warfarin use is associated with a number of limitations, including an unpredictable dose–response and excessive bleeding when not controlled adequately. Novel oral anticoagulants (NOAC), including dabigatran, rivaroxaban, and apixaban, have now been proved to provide a significant reduction in stroke risk without increasing the risk of intracranial haemorrhage, although dabigatran has been shown to increase the relative risk of MI by 33% when compared to warfarin.[7]

In Taiwan, half of AF patients (54.3%) take antiplatelet agents alone.[8–10] Although a national representative cohort study has shown a progressive increase in the use of warfarin among Taiwan Chinese patients over time, usage rates (24.7%) are still low when compared with Western populations (39–65%).[10] Randomized trials have shown that warfarin reduces the relative risk of stroke by 64%, while antiplatelet agents only reduce this by 22%.[8–10] It is clear that anticoagulation management among Chinese patients is suboptimal.[8–10] Under circumstances of poor anticoagulation control, the cessation of antiplatelet medications prior to dental surgery will, most likely, expose the patient to a fatal risk of thromboembolism. Therefore, the routine perioperative withdrawal of antiplatelet therapy in these patients may have devastating consequences.

Aspirin begins irreversibly inhibiting thromboxane A_2-induced platelet aggregation within 1 h of ingestion, and clopidogrel selectively inhibits adenosine diphosphate (ADP)-induced platelet aggregation within 2 h; this lasts for 7–10 days of the mean platelet life.[11,12] Dual therapies with aspirin and clopidogrel have a synergistic antiplatelet effect, as the two drugs affect platelet aggregation by different mechanisms. Compared with aspirin alone, dual oral antiplatelet therapy can provide an additional 20% reduction in the relative risk of MI or stroke.[11–13] Dual antiplatelet therapy and newer antiplatelet agents are associated with greater antithrombotic efficacy, but also with a higher bleeding risk than aspirin. However, studies have reported that no patients taking non-aspirin or dual antiplatelet regimens have had bleeding complications while undergoing dental surgery that have required more than local haemostatic measures.[14–16]

Most Western studies have reported that single antiplatelet therapy should not be stopped prior to dental surgical procedures and that patients on dual antiplatelet therapy may need to be referred to a hospital-based dental clinic.[14,15] In Taiwan, the debate about continuing or stopping antiplatelet therapy prior to dental extraction has been going on for a long time, with opinions varying between institutions and doctors. In over 25 years of clinical practice, the present researchers have not withheld antiplatelet therapy in any of their patients seeking dental extraction.

Perioperative bleeding has been shown not to differ significantly between patients who continue antiplatelet therapy and those who stop it of their own accord. Sufficient haemostasis can be obtained using local measures.[3,16]

The aim of this retrospective study was to evaluate the incidence of postoperative bleeding after dental extraction in patients without interruption of single or dual antiplatelet therapy. (Table 1 provides a list of all acronyms and abbreviations related to this study, for reading convenience.)

Table 1. Descriptions of all related acronyms and abbreviations.

Acronym	Description
AF	Atrial fibrillation
AHA	American Heart Association
CAD	Coronary artery disease
CVA	Cerebrovascular accident
CVD	Cardiovascular disease
OAC	Oral anticoagulant
MI	Myocardial infarction
NOAC	Novel oral anticoagulant

Patients and methods

The study was approved by the necessary institutional review board and comprised a total of 1363 consecutive subjects who underwent dental extractions performed by the same qualified dentist (the corresponding author) in the family dentistry department of the study hospital between January 2010 and June 2014. Data were retrieved from the chart notes made at each visit, and the following factors were investigated: patient clinico-demographic parameters (sex, age, dental disease, and medical illness), history of antiplatelet therapy (aspirin, clopidogrel, dual therapy), number and types of tooth extraction (simple or complicated extraction), and incidence of postoperative bleeding. Patients with a history of alcoholism, concomitant anticoagulant therapy, platelet counts below 60×10^9/l, interrupted antiplatelet therapy, liver dysfunction, or any systemic disease affecting postoperative bleeding or coagulopathies were excluded from the study. A total of 92 patients were excluded from the study because of warfarin therapy (65 patients), platelet counts below 60×10^9/l (two patients), and interruption of antiplatelet therapy by the individual him/herself (25 patients).

The remaining 1271 patients who underwent 3035 dental extractions on 1746 occasions were divided into two groups (Table 2). A convenience sample of 1088 consecutive patients who had never been on antiplatelet therapy comprised the control group. The study group comprised 183 patients, of whom 125 were on aspirin (100 mg/day), 42 were on clopidogrel (75 mg/day), and 16 were on dual therapy (100 mg aspirin plus 75 mg clopidogrel) (Table 2). The antiplatelet agents were being used for CAD (76 patients), cerebrovascular accident (CVA) (58 patients), AF (15 patients), hypertension (11 patients), primary prevention in diabetes (nine patients), peripheral artery disease or deep vein thrombosis (five patients), heart valve replacement (four patients), and organ transplantation (five patients). All were dental outpatients and had been advised against interrupting antiplatelet therapy in any way before dental extraction. In accordance with the American Heart Association (AHA) guidelines, an appropriate regimen of antibiotic prophylaxis was administered to patients with cardiac valvular disease or an organ transplant.[17] All procedures were planned with the patient's informed consent.

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