<Abstract>
Study about Dental Extraction of Patients Receiving Antiplatelet Treatment

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The population of patients with antiplatelet treatment is expanding globally with the rising prevalence of cardiovascular disease and increasing use of percutaneous coronary interventions. While antiplatelet agents have revolutionized the management of atherosclerotic disease and its thrombotic complications, the potential of bleeding remains an inherent risk. Dentists are more likely to stop antiplatelet therapy before dental extraction because they think that the patient is at high risk for bleeding. However, stopping or altering antiplatelet therapy may expose such patients to the risk of a thromboembolic event such as thromboembolism, myocardial infarction, or cerebrovascular accidents, particularly in patients with drug-eluting stent. In this study, we report 3 cases that were performed dental extraction in patients receiving single or dual antiplatelet therapy without immediate and late post-extraction bleeding and reviewed the literature on dental extraction in patients receiving antiplatelet therapy. We concluded that dental extractions may be safely performed in patients receiving single or dual antiplatelet therapy when appropriate local hemostatic measures are taken, thus averting thrombotic risk of temporary antiplatelet discontinuation.

Key words: Antiplatelet therapy, Dental extraction, Immediate and late bleeding, Thrombotic risk

I. Introduction

Advances in medical science have ensured an increased lifespan for human beings. Unfortunately, this has come at the price of a greater incidence of medically compromising conditions in a large proportion of such individuals. The population of patients for antiplatelet treatment is expanding globally with the rising prevalence of cardiovascular disease and increasing use of percutaneous coronary interventions. Antiplatelet agents such as Acetylsalicylic acid (Aspirin®, Astrix®, Rhonal®), Clopidogrel (Plavix®, Plavitor®, Plateless®), Triflusal (Disgren®) are widely used in alone or dual therapy for prevention of ischemic cardiovascular events and stent thrombosis. Optimal dental management of patients receiving antiplatelet treatment remains a frequent, challenging issue faced by dentists because while antiplatelet agents have revolutionized the management of atherosclerotic disease and its thrombotic complications, the potential of bleeding remains an inherent risk. Dentists are more likely to stop antiplatelet therapy before dental extraction because they think that the patient is at high risk for bleeding. The risk of excessive bleeding prompts consultation physicians to recommend to stop the drug 7 to 10 days or at least 3 days...
before any oral surgical procedure based on the irreversible
effect exerted by antiplatelet drug on platelets\(^2,3\). However
stopping or altering antiplatelet therapy may expose such
patients to the risk of a thromboembolic event such as
thromboembolism, myocardial infarction, or cerebrovascular accidents partcularly in patients with drug-eluting stent\(^4,7\). Discontinuation of antiplatelet therapy is the
dominant risk factor for the occurrence of late stent thrombosis in patients with drug-eluting stent\(^8,14\). For this reason,
treatment guidelines for patient with drug-eluting stent now
recommend maintaining dual antiplatelet therapy for at
least 12 months. However, antiplatelet agents are fre-
quently interrupted in everyday dental practice. This is
clearly an empirical, rather than an evidence-based ap-
proach, based on excessive concerns about potential post-
extraction bleeding complications.

In the last decade, advances in biotechnology have
resulted in an explosive growth of topical hemostatic agents\(^15\). So it is able to control of bleeding easily with
the help of hemostatic agents in dental clinic. Various he-
mostatic measures such as oxidized cellulose (surgical\(^5\)),
gelatin sponge (Gelfoam\(^\circledR\)), atelocollagen sponge
(Teruplug\(^\circledR\), Collaheal\(^\circledR\)) have been used to control bleeding
in dental clinic.

In this study, we report 3 cases that were performed dental
extraction in patients receiving single or dual antiplatelet
therapy without immediate and late postextraction bleeding
and reviewed the literature on dental extraction in patients
receiving antiplatelet therapy.

### II. Materials and Method

We studied 3 patients who visited in Dankook University
dental hospital for multiple teeth extraction with antiplatelet
treatment. They extracted tooth or teeth with continuing
antiplatelet drugs and studied their post extraction bleeding
(table 1).

#### Case 1

The 59 years old female visited Dankook university dental hospital emergency room for toothache, X-ray revealed
advanced proximal dental caries of right maxillary third molar (figure 1). She had a systemic disease of diabetes meli-
tus, ischemic heart disease, hypertension and was taking on aspirin. We called up her medical doctor to discuss
about her medical condition, He said that she had a well-controlled blood sugar and stable angina and recommended
for discontinuing aspirin for 7 days before dental extraction. After the instructions to stop aspirin, IM injection of painkillers, she was discharged with PO medication of

| Table 1. The patients who were extracted with receiving single or dual antiplatelet therapy. |
|-----------------|-----------------|-----------------|-----------------|
| age             | 59              | 65              | 79              |
| sex             | female          | female          | male            |
| medical history | diabetes mellitus, ischemic heart disease | diabetes mellitus, ischemic heart disease, coronary artery stent | atrial fibrillation, coronary artery stent, prostate cancer |
| antiplatelet drug | aspirin only    | aspirin & clopidogrel | aspirin & clopidogrel |
| number of extraction | 1(surgical extraction) | 10(simple extraction) | 6(simple extraction) |
| interrupting antiplatelet drug | none(continuing aspirin) | clopidogrel(continuing aspirin) | none(continuing aspirin & clopidogrel) |
Fig. 1. Periapical radiograph of case 1 patient: Rt maxillary third molar was extracted surgically with continuing aspirin.

analgesics and antibiotics. The next day, she revisited dental clinic to complaining severe pain of the tooth. We decided to extractions without interruption of aspirin, We performed right maxillary 3rd molar extraction under local anesthesia (lidocaine 2% with 1:100,000 epinephrine) with maintenance aspirin, Tooth was extracted surgically with odontomy, ostectomy and inflammatory granulation tissue was curetted as much as possible. Regarding local hemostatic measures, atelo-collagen sponge (Teruplug®, Terumo Co, Tokyo, Japan) was placed in the wound socket then fixed by placing figure eight sutures using 3-0 silk. The patient was instructed to bite down on gauze for 30 minutes for compression and hemostasis was confirmed. The patient was checked after 30 minutes and then discharged with strict instructions, Sutures were removed after 1 week. There was not immediate and late bleeding event.

Case 2

The 65 years old female visited in Dankook university dental hospital for total dental treatment. She have the medical disease such as ischemic heart disease with coronary artery stenting and type 2 diabetes mellitus with insulin injection. Clinical and radiographic exam revealed multiple hypermobility teeth and root rest on maxilla/mandible (figure 2). We planned complete denture on the maxilla and removable denture on the mandible after multiple teeth extraction. We consulted her medical doctor for her medicine and possibility of multiple dental extraction. Her doctor answered that she has a well-controlled DM and she was taking on antiplatelet agent as acetyl salicylic acid (Aspirin®), clopidogrel (Plavix®), so clopidogrel is able to stopping but aspirin must not stop because of the risk of stent thrombosis. We instructed patient to stop clopidogrel for 4 days before dental extraction. We performed multiple teeth extractions (8 maxillary teeth and 2 mandibular teeth) under local anesthesia, (lidocaine 2% with 1:100,000 epinephrine) with maintenance aspirin, The multiple teeth (10 number) were extracted with minimal invasion and inflammatory granulation tissue was curetted as much as possible. Regarding local hemostatic measures, atelo-collagen sponge (collaheal® Bioland, Co, Korea) was placed in the wound socket then fixed by placing continuous sutures using 3-0 silk. Patients were then instructed to bite down on gauze for 30 minutes for compression and hemostasis was confirmed. The patients were checked 30 minutes after the completion of the procedure and was then discharged with strict instructions, Sutures were removed after 1 week. There was not immediate and late bleeding event.
Case 3)

The 79 years old male visited in Dankook university dental hospital for complaining of pain and swelling of Lt mandible. He had the medical history of coronary heart disease, atrial fibrillation with stent and prostate cancer. He had moderate swelling on Lt chin and intraoral swelling on Lt lower vestibule with multiple root rest (figure 3). We diagnosed Lt submandible abscess and prescribed antibiotics (metronidazole, penicillin) and consulted medical doctor for his taking medicine and possibility of multiple dental extraction. His doctor answered that his cardiac function was normal range, so dental procedure was possible, but he was taking on antiplatelet agent as acetyl salicylic acid (Aspirin®), clopidogrel (Plavix®), so antiplatelet agent was able to stopping for 4days but the stent thrombosis was able to inevitably occur. We instructed to stop two antiplatelete drugs for 4days before dental extraction, but he experienced chest pain after stopping of two antiplatelet drugs. So we re instructed the patient to taking his antiplatete drugs and decided to extract multiple teeth without discontinuing of dual antiplatelet drug. After a few days, his chest pain was eliminated and facial swelling was decreased. We performed multiple teeth extractions (6 mandibular anterior root rest) while maintenance two antiplatelet therapy were continued under local anesthesia (lidocaine 2% with 1:100,000 epinephrine). The multiple teeth (6 number) were extracted with minimal invasion, and inflammatory granulation tissue was curetted as much as possible. Regarding local hemostatic measures, atelocollagensponge (collaheal® Bioland, Co, Korea) was placed in the wound socket then fixed by placing continuous sutures using 3-0 silk. Patients were then instructed to bite down on gauze for 30 minutes for compression and hemostasis was confirmed. The patients were checked 30 minutes after the completion of the procedure and were then discharged with strict instructions, Sutures were removed after 1 week. There were not immediate and late bleeding event (figure 4).

III. Discussion

Thrombotic and thromboembolic occlusion of blood vessels are the main cause of ischemic events in heart and brain. Since thrombi occluding arteries were rich in platelets, antiplatelets and anticoagulants have been extensively developed as potential therapies for the prevention and management of arterial thrombosis. Platelet activation and aggregation is considered to be central to arterial thrombous production. Platelets are the major players in arterial thrombosis and therefore are attractive targets in the prevention and treatment of cardiovascular disease such as my-
A recent study evaluated the safety and effectiveness of aspirin and clopidogrel in patients undergoing dental extractions. The study was conducted in Spain and included 100 patients with drug-eluting stents who underwent dental extraction without stopping antiplatelet agents. Of these, 10 having triple antiplatelet therapy and 90 having dual therapy, 2 cases of excessive intraextraction bleeding were encountered that continued at the extraction site for 4 and 5 hours, respectively, after extraction. The cases were treated with simple pressure packs, and one case was on triple antiplatelet therapy, whereas the other case was on dual therapy. The authors suggested that it may be feasible to continue antiplatelet therapy in such patients.
for patients with drug-eluting stent to continue their antiplatelet therapy, even triple antiplatelet therapy, for dental extraction.

In our study, Case 3 patient with uninterrupting antiplatelet dual therapy were not experienced immediate or late bleeding after multiple dental extraction.

The optimally balance the bleeding risk of uninterrupted antiplatelet therapy versus the thrombotic hazard of temporary antiplatelet withdrawal before dental procedures has been an unanswered question for a frequent clinical problem. However current recommendations suggest uninterrupting antiplatelet therapy in patients with drug-eluting stent undergoing dental procedures. Dodson suggested that simple extraction of less than three is safe without interrupting the antiplatelet therapy but if 3 more teeth extraction is needed, it is recommended to divide 2-3 teeth extraction.

In our study, because case 2 patient is needed upper, lower temporary denture and aspirin is not stopping during extraction, we performed multiple number teeth(10 number) extraction at one time and used hemostatic material. In case 3 patient, pus discharge origin was multiple root rest, we performed multiple number teeth(6 number) extraction at one time and used hemostatic material. In the present study, local hemostatic measures primarily consisted of placing atelo-collagene sponge and sutures, and local hemostatic management was favorable. Oxidized cellulose (Surgicel®), Gelatin Foams (Gelfoam®), atelo-collagen sponge(Teruplug®, Collaheal®), HemCon, Microfibrillar Collagen (Avitene), Fibrin Glue have all been reported as local hemostatic measures for tooth extraction in patients on antithrombotic therapy. Lillis et al reported that Hemorrhagic complications mostly occurred in the setting of periodontitis. Local inflammation in relation to local hyperemia and possibly fragility of the blood vessels might predispose to post-extraction bleeding. Presence of periodontitis could thus be control before dental extraction in patients who are more likely to develop hemorrhage while receiving antiplatelets and dentist should prompt appropriate hemostatic measures.

It is imperative that the postoperative medications that are given to patients do not in the short term potentiate the anticoagulant effects. Some medications that are known to do this are the NSAIDs and to a lesser extent the cyclo-oxygenase (COX)-2 inhibitors. NSAIDs have the anti-platelet effects and selective COX-2 inhibitors increased the INR. Also amoxicillin, cephalosporin by increasing the INR can increase the risk of delayed bleeding if they are taken in the long term for prevention of infection. In our study, Acetaminophen was given to all patients with antiplatelet therapy for pain control and preventing delayed bleeding.

Other considerations for dental surgery in patient with antiplatelet therapy is follows. Oral procedures must be done at the beginning of the day because this allows more time to deal with immediate re-bleeding problem. Also the procedure must be performed early in the week, allowing delayed re-bleeding episodes, usually occurring after 24-48h, to be dealt with during the working weekdays. Surgery, when performed, should be as atraumatic as possible, being careful to handle the tissues gently and to place sutures appropriately. Figure eight sutures should be considered for extraction sites even when adherent type hemostatic agents such as gelfoam or surgicel, and atelocollagen sponge were applied. Granulation tissue in extraction sockets should be removed before placement of hemostatic agents, as the granulation tissue is a frequent source of postextraction bleeding.

Discontinuation of antiplatelet therapy, including acetylsalicylic acid(aspirin) and thienopyridine (clopidogrel) is the dominant risk factor for the occurrence of late stent thrombosis in patients with drug-eluting stent. If patients stopped both antiplatelet agents simultaneously, the me-
Median time to event of thrombosis was 7 days. If the clopidogrel was stopped but aspirin was maintained, the median time to thrombosis event was 122 days. Among the 48 patients who stopped both agents, in 36 cases (75%) late thrombosis occurred within 10 days. Among the 94 patients who discontinued a clopidogrel but continued aspirin, only 6 cases (6%) occurred within 10 days. In our study, case 2 patient with drug-eluting stent was not experienced cardiac discomfort within 4 days of stopping clopidogrel and maintaining aspirin. But case 3 patient with drug-eluting stent experienced chest pain within 2 days of stopping both antiplatelet agents. These observations presented us with the dilemma of whether or not to stop antiplatelet therapy before minor oral surgery. In my opinion, dental extractions may be safely performed in patients receiving single or dual antiplatelet therapy when appropriate local hemostatic measures are taken, thus averting thrombotic risk of temporary antiplatelet discontinuation. Yet because of the substantial interindividual variability in response to drug effect and in intrinsic bleeding tendency, dentists should be particularly cautious to dental procedures.

IV. Conclusion

Dental extractions may be safely performed in patients receiving single or dual antiplatelet therapy when appropriate local hemostatic measures are taken, thus averting thrombotic risk of temporary antiplatelet discontinuation.

V. References


