

Bleeding Control of Dental Extraction in Patients Treated with Heparin Therapy

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Abstract

Background: The administration of antiplatelet drugs to patients as part of heparin therapy is one method that can be used to prevent thrombosis. This can be done either prophylactically or in patients who are undergoing percutaneous coronary intervention. The purpose of this study was to investigate whether or not removing teeth prior to treatment with dual antiplatelet medication is effective. **Materials and methods:** There were a total of 200 people who were investigated for having dental extractions done on them. The epinephrine fraction and the adenosine fraction of collagen with the operative surface, as well as the post-surgical measures and the adverse consequences, were both evaluated. Following the completion of the surgical procedure, all of the patients were given tranexamic acid-impregnated gauzes and alveolar sutures as part of their post-operative care. For the purpose of making comparisons between quantitative variables, the student's t-test and the Pearson correlation coefficient were utilized. As a consequence of these comparisons, descriptive statistics were computed and examined. We considered a value of P that was less than 0.05 to be statistically significant. **Results:** Both the epinephrine fraction, which was measured at 441 ± 22.3 seconds with a range of 13050 to 350 seconds, and the adenosine fraction, which was measured at 201 ± 12.23 seconds with a range of 130-350 seconds, were measured to be longer than the typical range. The results of this study show that both of these fractions are longer than the typical range. Because we took all of the necessary precautions after the surgery, not a single patient experienced any post-operative complications like bleeding, hematoma, or infection. **Conclusion:** It was possible to safely perform dental extractions on patients who were receiving dual antiaggregant therapy by making use of non-resorbable sutures and gauze that had been impregnated with tranexamic acid. The patient was instructed to hold the gauze in place for twenty minutes.

Keywords: Dental Extraction, Management, Bleeding, Heparin, Surgery.

INTRODUCTION

Hemostasis is able to prevent further loss of blood because fibrin is produced during the process (clotting). This process can be broken down into three stages: the vascular stage, in which neurogenic vasoconstriction blocks blood flow for a period of twenty seconds; the muscular stage; and the mental stage (1). Formation of platelet thrombus occurs concurrently with platelet aggregation, which concentrates numerous components that are necessary for the third phase of plasma coagulation (2). Within twenty seconds, this phase will have completed its complex chain of proteolytic processes, which will have caused fibrin to clot (3). In order to begin the process of blood clot formation, the first step that must take place is the activation of coagulation factors. These factors include blood vessel, platelet, and blood protein secretions (4). The dual antiplatelet treatment consists of clopidogrel and aspirin and has two indications: the prevention of thrombotic cerebrovascular accidents and acute myocardial infarction in patients who have acute coronary syndromes or who are undergoing percutaneous coronary intervention. The dual antiplatelet treatment is administered to patients who have acute coronary syndromes or who are undergoing percutaneous coronary intervention (5). Patients who are currently being treated for acute coronary syndromes are eligible for treatment under either of these indications. Platelets play a significant part in thrombotic events; medications that inhibit platelet function can prevent these processes from occurring (6). Taking aspirin on a consistent basis has been shown by a significant body of research to be an effective way to reduce the risk of developing vascular problems. Aspirin is able to inhibit the activity of cyclooxygenase because it acetylates the hydroxyl group that is found on the serine residue of the enzyme (7). Thienopyridine is the starting material for the production of the antiplatelet medication clopidogrel. Adenosine diphosphate can cause platelets to clump together, but this substance stops that from happening. In a study, the effectiveness of clopidogrel was evaluated by contrasting its effects with those of a daily dosage of 400 mg of aspirin and a dosage of mg of clopidogrel (8). Clopidogrel has been shown to be more effective than aspirin in reducing the risk of cardiovascular mortality and myocardial infarction, according to a number of studies. This advantage was only maintained in individuals who displayed symptoms of peripheral

artery disease (9). Because aspirin and clopidogrel accomplish their goals in distinctive ways, it was hypothesized that taking both medications would lead to an increase in the rate at which cardiovascular disease could be avoided (10). Individuals who are currently taking antiplatelet medication and who need to have teeth extracted absolutely require treatment for bleeding and hematoma. It is possible to reduce the amount of bleeding that takes place during oral surgery, as well as the amount of bleeding that takes place after the procedure (11). During the course of this research project, a method for performing dental extractions on patients who were receiving dual antiplatelet therapy was investigated.

Material and methods

Samples

One hundred patients who had appointments at one of the specialty clinics in the Wasit province that are run by dentists agreed to take part in the research. These patients were scheduled to have teeth extracted at one of the clinics. These people came from one of the clinics located throughout the province, where they were recruited. Participants in the study were required to have a history of a myocardial infarction or another form of heart disease that required coronary revascularization as well as the implantation of a stent within the previous year in order to be eligible to take part in the research. After each of these patients had been hospitalized for at least a week due to their condition, they were eligible for participation in the study. As a measure of precaution against the occurrence of thromboembolic events, a prescription for two platelet antiaggregant medications was written for each patient to take in order to reduce the risk of complications. Every person who took part in the research project signed a waiver stating that they were aware of the risks that were involved and that they gave their informed consent to take part in the study. Patients who were already taking any kind of medication that could potentially affect their blood's ability to clot were not allowed to participate in the study. Patients who required extractions that involved osteotomies were not included in the study. Neither were patients who were diagnosed with disorders that led in a terminal diagnosis or substantial risks of mortality. Patients who needed to have their teeth extracted were excluded from the study.

History of cases

Analyses were performed on a great number of aspects of the experiment, including the epinephrine fraction, the adenosine fraction, the collagen surgical surface, postsurgical measures, and adverse effects. Two figures that are derived from a test that evaluates platelet function using a platelet function analyzer that aspirates blood through two discs containing different agonists to platelets are called the epinephrine fraction and the adenosine fraction, respectively. These figures are referred to as the epinephrine fraction and the adenosine fraction, respectively. The epinephrine fraction and the adenosine fraction are the names given to these two figures when referred to by their individual names. The third diagram depicts collagen in its various forms. It offers a numerical representation of the amount of time required to shut the hole found on the interior of the disc. If we are speaking about the samples of adenosine, the typical values could fall anywhere between 130 and 300 seconds.

Pre-surgical

Heparin function test times are prolonged in cases of thrombocytopenia or thrombopathia, and so the delay in obturation with collagen/adrenalin is characteristic of patients who consume aspirin or other non-steroidal anti-inflammatory drugs, while the prolongation of obturation time with collagen- the adenosine samples occurs in patients consuming antiaggregant inhibitors of the adenosine samples. Heparin function test times The testing times for platelet function are drawn out. In order to carry out surgical surface evaluation, points were awarded for each unique type of tooth as well as the amount of space on the alveolar surface that it occupied. This was done in order to compare the results of the evaluation. A score of two points was assigned to each of the upper and lower incisors, a score of 2.5 points was assigned to each of the canines and premolars, and a score of three points was assigned to each of the molars. These scores were used to investigate the possibility of a connection between the occurrence of problems and the portion of the alveolar surface that was occupied by the tooth. This portion of the alveolar surface was determined by the tooth's position on the occlusal plane.

Post-surgical

After the operation, each patient received the identical post-operative care as well as instructions. The surgical procedures did not begin until the hematologist had provided a positive report on the findings of the coagulation test. Only after this point did the procedures begin. The mixture of articaine and epinephrine that was used as the local anesthetic was 1 milligram of

epinephrine for every milligram of articaine. The only exceptions to this rule were people who were allergic to local anesthetics or had an extreme sensitivity to epinephrine. It took anywhere from 2.5–3 strands of silk and a curved triangular needle to stitch all of the alveolae together. This was done with the goal of securing the gingival margins, which ultimately led to an improvement in the hemostasis. After the sutures were placed, the patient was given gauze that had been impregnated with tranexamic acid and instructed to bite on it for the following twenty minutes. This was done in order to prevent any infection from occurring. After that, the patient was examined once more to verify that the bleeding had been brought under control following the initial attempt that had been made. When it was determined that this was the correct diagnosis for the patient, the patient was given an ampoule of tranexamic acid and a packet of sterile gauzes before being discharged from the hospital. This was done before the diagnosis was confirmed. Throughout the course of the study, consideration was given to the following secondary effects: none (zero points), bleeding (a), oedemic (b), inflammation (c), and others (d).

Data analysis

In order to facilitate comparisons between quantitative aspects, the student's t-test and the Pearson correlation coefficient were utilized. The findings of these comparisons served as the basis for the subsequent compilation and examination of descriptive statistics. When P was lower than 0.05, we came to the conclusion that there was a relationship between the two variables that was supported by statistical evidence.

Results

There were a total of one hundred patients present, with one hundred of them being male and the remaining one hundred being female. The ages of the patients ranged from forty-five to seventy-seven, with seventy-five years and six months representing the average age of the patients in this study. The total number of patients comprised fifty-one females and fifty-nine males. It was determined that the average age of the participants was seventy-five years and six months on mean. The epinephrine fraction in seconds, on the other hand, was measured at a value of 441 ± 22.3 seconds, with a range of 150 to 350 seconds, and the P value for this comparison was 0.01. The adenosine fraction in seconds was measured at 201 ± 12.23 seconds, with a range of 120 to 250 seconds, and the epinephrine fraction in seconds was measured at 302 ± 44.3 seconds, with a range of 130 to 300 seconds (Figure 1).



Figure 1: patient no. 30 without treatment with heparin intervention

Both of the percentage values were substantially higher than what might be thought of as the laboratory's average for that particular variable. There was not a single patient who experienced any bleeding after the procedure had been completed. The values that were obtained for the surgical surface ranged from one to four points, with the mean value being determined to be 3.40.22 points (Figure 2).

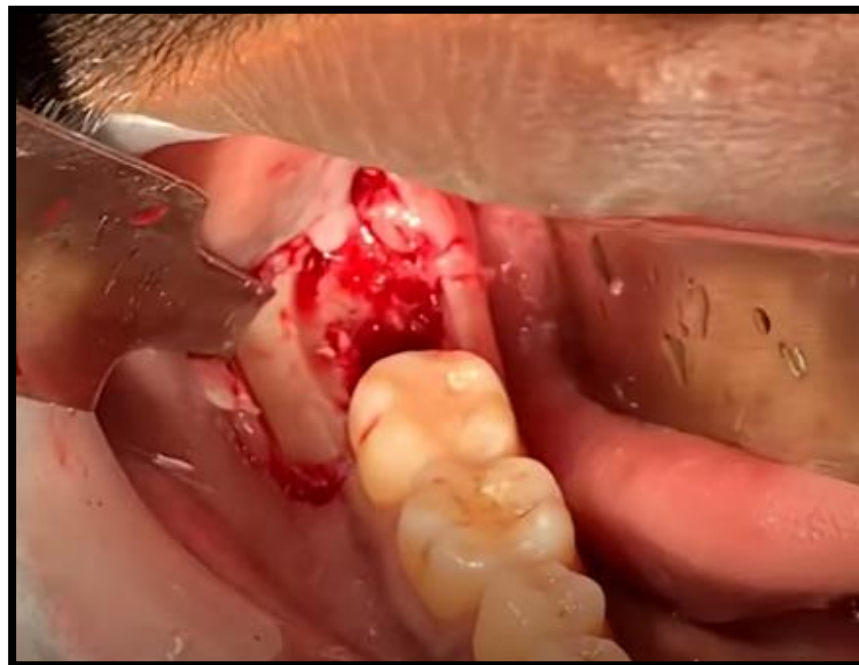


Figure 2: patient no. 24 with treatment with heparin intervention.

There was a range that started at one point and went all the way up to four points. There were no differences that could be considered statistically significant in relation to the gender of the participants ($p = 0.78$). After having teeth extracted, not a single patient experienced post-operative complications such as hematoma or infection as a direct result of the post-surgical care that was provided. When it was determined that this was the correct diagnosis for the patient, the patient was given an ampoule of tranexamic acid and a packet of sterile gauzes before being discharged from the hospital. This was done before the diagnosis was confirmed. The following secondary effects were taken into consideration at various points throughout the course of the research: none (zero points), bleeding (a), oedemic (b), inflammation (c), and others (d) (figure 3). (Figure 4).



Figure 3: patient no. 17 without treatment with heparin intervention.



Figure 4: patient no. 13 with treatment with heparin intervention.

Discussion

Oral surgery must take into account the cause, severity, type, location, and scope of the condition when treating patients who have problems with the function of their platelets (12). The degree to which the surgical site is accessible for the treatment of local hemostasis will determine the risk. Both hemorrhage and hematoma have the potential to restrict airflow, putting the patient's life in jeopardy as a result of the condition (13). Minimizing trauma, avoiding flaps, utilizing surgical methods that encourage suturing and cauterization, and providing appropriate care for hemostasis are some of the most effective strategies for reducing bleeding during and after surgery (14). After oral surgery, a patient is required to have a hematological analysis as well as a coagulation test within the first twenty-four hours following the procedure. In the event that there is more than one extraction, the results of the test should be considered reliable for up to two weeks, taking into account the manner in which the

patient behaved immediately following each procedure (15). After the allotted amount of time has elapsed, a fresh coagulation test is required to be carried out before any additional extractions can be carried out. In this investigation into the activity of platelets, the effects of clopidogrel and aspirin led to an increase in both the collagen/epinephrine fraction and the adenosine fraction. Both of these fractions had previously been found to be lower than normal. It was found that the platelet function analyzer known as the PFA-100 was worthy of investigation (16). We took samples from one hundred patients who had undergone oral surgery and been treated with antiplatelet medications. Their ages ranged from 24 to 80. They underwent a bleeding time test utilizing the Ivy method, as well as an international normalized ratio test on the same day, a Coagula-check one hour before surgery, and a PFA-100 evaluation (17). The PFA-100 platelet function analyzer demonstrated superior accuracy when compared to the traditional method of determining the duration of bleeding (18). Anticoagulant medications not only hasten the process of bleeding but also increase the likelihood of post-operative bleeding (19). Patients are advised by a number of dentists to stop taking the aforementioned medications at least three days before their oral surgery appointment. In the event that a patient's pharmacological treatment is abruptly terminated, the patient is placed in a position where they are at risk for potentially life-threatening vascular problems (20). Several studies have reported the use of antifibrinolytic medications in oral surgery; however, the manner in which these medications are administered, the techniques that are used, and the timing might vary substantially from one another (21). In addition to using medications that stop bleeding, some sources recommend using antifibrinolytic medication after surgery in order to prevent bleeding after the procedure. [22] If tranexamic acid is given topically as a post-operative antifibrinolytic medication for a period of two days following surgery, certain individuals are of the opinion that a great number of patients will be able to successfully undergo surgical procedures without having to deviate from their typical anti-coagulation regimen and without requiring additional intervention from medical professionals (23). Several different hemostatic procedures have made use of the fibrin that can be found in human blood. It is not common practice to use fibrin gel to treat hemorrhagic patients in order to stop bleeding because of the high cost of this medication. According to the findings of a number of other studies, fibrin gel cannot be utilized because it may make viral infections more likely. Platelets are a natural deposit for growth factors such as platelet-derived growth factor (24), TGF-beta, insulin-like growth factor, and epidermal growth factor. Platelets are also a natural deposit for cytokines (25). Autologous platelet concentrate is used by a large number of medical professionals to assist anti-coagulation patients in recovering in advance of cardiovascular surgery, which carries a significant risk of bleeding. This is done in order to reduce the likelihood that the patient will experience excessive blood loss. Patients were instructed to gargle their saliva rather than spitting it out during the course of the tamponade, and they were asked not to speak at any point during the procedure (26). This technique was successful in stopping the bleeding because it preserved the blood clots and allowed them to coagulate (27). After the extraction procedure, Rojas et al. applied a gauze tamponade that had been soaked in tranexamic acid to the affected area for ten minutes. In addition, immediately after having teeth extracted, applying pressure for several minutes with gauze that has been soaked in tranexamic acid, and then following this up with mouthwashes every six hours for seven days is highly recommended (28). Another difficult topic to tackle is that of variable surgical sutures. Suturing should be avoided at all costs, and if it must be done, non-resorbable sutures should be used to reduce the likelihood of inflammatory responses that could prevent blood from clotting. If suturing is unavoidable, then non-resorbable sutures should be used (29). When it comes to other patients, such as Brewer, the dentist has the option of using either resorbable or non-resorbable sutures; depending on the specifics of the procedure and the level of experience they possess (30). Because there is a risk of bleeding associated with the removal of non-resorbable sutures, a post-operative visit needs to be scheduled 8 days after the procedure (31). During the course of this experiment, a suture was necessary for each and every extraction that was carried out. A 2-0 silk suture was used in conjunction with a curved triangular needle to improve hemostasis and seal the gingival boundaries. This was done in order to seal the gingival borders and prevent bleeding (32). Sutures were removed between 8 and 10 days after an extraction, which had been performed earlier. Another contentious issue is the length of time a patient is required to undergo treatment; estimates range from six months to two years, with twelve months being the standard (33). When looking at the people who received combination treatment versus those who received basic antiaggregating treatment, the current study found that the incidence of problems was significantly lower for the latter group.

Conclusion

Dental extraction was performed safely in patients who were receiving dual heparin therapy by following a protocol that reduced the amount of trauma experienced by the patient to a minimum, utilized non-resorbable sutures, and applied an antifibrinolytic agent gauze impregnated with tranexamic acid to the extraction site, which the patient then held in place under pressure for twenty minutes.

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