CLINICAL EVALUATION OF GELATAMP DENTAL DRESSING FOLLOWING DENTAL EXTRACTION IN PATIENTS UNDER ASPIRIN AND CLOPIDOGREL THERAPY- A RANDOMIZED CONTROL CLINICAL STUDY

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ABSTRACT

Aim

The aim of the study is to evaluate the use of Gelatamp dental dressing in cardiac patients taking aspirin and clopidogrel following dental extraction.

Objective

Dental extraction in cardiac patients taking aspirin and clopidogrel can be difficult as these patients present a significant risk for post-operative hemorrhagic complications. This study is performed to evaluate the use of Gelatamp dental dressing in cardiac patients taking aspirin and clopidogrel following dental extraction without stopping the therapy.

Materials and Methods

This is a randomized clinical trial and was approved by the institutional review board and the ethical committee and an informed consent was obtained from all patients before their inclusion in the study.

This study was conducted on 84 patients with an age range of 32 to 62 years who were referred to the Oral and Maxillofacial Surgery department, Best Dental Science College, Madurai. All patients were cardiac patients and under aspirin or/and clopidegrol therapy with no known or controlled diabetic or/and hypertention, who preferred extraction as a treatment option.

Extractions were performed for all patients without altering the dose of the anticoagulant. Prior to the procedure physician's concern has been obtained. Patients who had an INR >3.5 on the day of operation or had a history ofliver disease or coagulopathies, Patients under warfarin and heparin therapy and immuno-compromised patients were excluded from this study. Patients under aspirin or/and clopidegrol therapy were included in this study.

The patients were randomly divided into two groups: group A, where the extraction sockets weresutured with 3.0 black silk, and group B, where the extraction sockets were packed with Gelatamp and sutured with 3.0 black silk. The allocation of patients into either group was random nonblind as there was no way to mask the Gelatamp group from the control group.

A full medical history was taken and an IOPA/ an orthopantogram and clinical examination were performed. Antibiotic prophylaxis was given to all patients one hour pre-operatively, in the form of 875mg Amoxicillin and 125 mg Clavulanic acid. A preoperative INR was performed for all patients on the day of extraction. If the INR was more than 3.5, the patient was excluded from the study.

Group A

Local anesthesia, 2% lidocaine and 1:80,000 epinephrine was given to the patients using standard injection techniques. Dental extractions were then performed as atraumatic as possible, using extraction forceps and elevators when needed. Immediately following extraction, the sockets were sutured with 3/0 black silk.

Group B

Same procedures were done as in group A but in this group the extracted socket is sutured along with Gelatamp pack at the height of alveolar bone wherever needed the gelatamp is trimmed using scissors to fit inside the socket.

The time of hemostasis was recorded for each patient using a stop watch at the time of extraction. Antibiotics were continued three days post-extraction in the form of 875 mg amoxicillin and 125 mg clavulanic acid once a day. Analgesics were prescribed every 8 h for 3 days in the form of paracetomol 500 mg.

Post-extraction sites were monitored to assess potential late hemorrhagic complications and to evaluate pain and swelling in 1st, 3rd and 5th post-operative day. Pain scores were evaluated using the Visual Analogue Scale (VAS) where 0 means no pain and 10 being the worst pain the patient had ever experienced.Swelling assessment were done using Tape measurement method by Gabka and Matsumara.

Sutures were removed one week following extraction. Soft tissue healing is assessed by Laundry, Turnbull, and Howley index.

CONCLUSION

Better pain control and wound healing potential after extraction in patients continuing aspirin and/ or clopidogrel therapy provided that the INR range should be ≤ 3.5.

KEYWORDS: Antiplatelets, Gelatamp, thromboembolic events, INR

DOI Number: 10.14704/nq.2022.20.9.NQ44511 **Neuro Quantology 2022; 20(9):4469-4478**

INTRODUCTION

Hemostasis is an important physiologic mechanism of the body to prevent excessive blood loss when the blood vessel is severed or injured. Hemostasis occurs by initial vasoconstriction and formation of clot. Formation of clot involves two main process; Platelet aggregation and coagulation (formation of fibrin strands). Coagulation or clotting is defined as the process in which blood loses its fluidity and becomes a jelly-like mass few minutes after it is shed out. Coagulation of blood occurs through a series of reactions due to the activation of a substances necessary for clotting mechanism is called clotting factors.

Thirteen clotting factors are identified:

Factor I Fibrinogen

Factor II Prothrombin

Factor III Thromboplastin (Tissue factor)

Factor IV Calcium

Factor V Labile factor (Proaccelerin or accelerator globulin)

Factor VI Presence has not been proved

Factor VII Stable factor

Factor VIII Antihemophilic factor (Antihemophilicglobulin)

Factor IX Christmas factor

Factor X Stuart-Prower factor

Factor XI Plasma thromboplastin antecedent

Factor XII Hageman factor (Contact factor)

Factor XIII Fibrin-stabilizing factor(Fibrinase).

Coagulation is complex cascade process of enzymatic events that forms the fibrin stands. Formation of prothombin activator that converts prothrombin into thrombin occurs in either though intrinsic or extrinsic pathway. The intrinsic pathway is initiated within the bloodstream by platelet thromboplastin. Heparin

influences this pathway by inhibiting factors XIIa, XIa, and IXa, its aanticoaulant activity is monitored by activated partial thromboplastin time (aPTT). The extrinsic pathway functions outside the bloodstream, initiated by tissue thromboplastin. This pathway is influenced by warfarin because it inhibits hepatic synthesis of factor VII, the most essential factor in the extrinsic pathway. Therefore the anticoagulant activity of warfarin is uasually monitored using the prothrombin time (PT). (figure-1). [1,i].

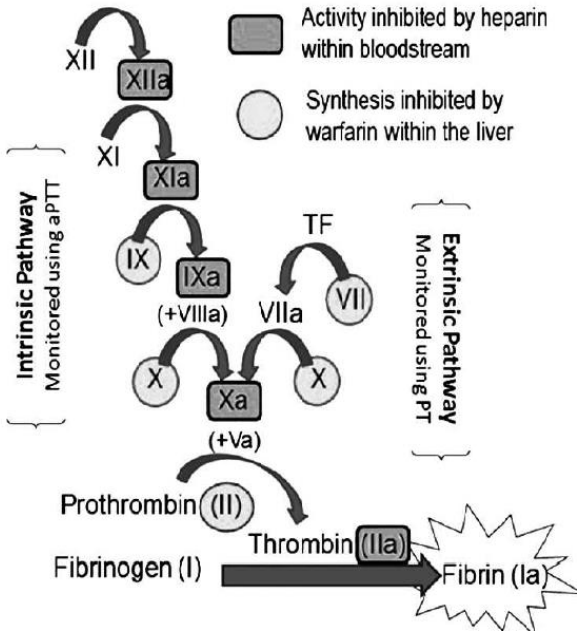


Figure-1: The coagulation pathway

At the site of arterial injury, platelets initiates hemostatic plug and thus contributes for the formation of arterial thrombosis that leads to increased incidence of ischemic stroke and myocardial infarction. Venous thrombi commence as fibrin strands, appear red in colour because of entrapped red blood cells, and can get embolize at distant sites, usually in pulmonary arteries causing pulmonary embolism. To prevent as well as to treat cardiovascular and cerebrovascular thromboembolic conditions, antithrombotic therapy is indicated.Antithrombotics includes inhibition of platelet aggregations (Antiplatelet), inhibition of fibrin strands formation (Anticoagulant), dissolution of fibrin clot (fibrinolytic).[2,ii](figure-2)

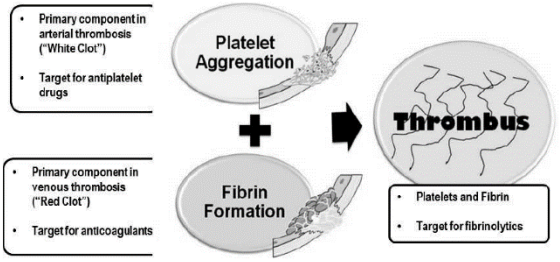


Figure- 2; Thrombus consists of 2 principal components: an aggregate of platelets and a fibrin mesh. Platelet activity consists of adherence to vessel walls (adhesion) and to one another (aggregation). The fibrin mesh is synthesized during a complex cascade of enzymatic reactions leading to the formation fibrin strands (coagulation).

The common indications if antithrombotic therapy are arterial thrombosis, ischemic heart disease, myocardial infarction, both stable and unstable angina, coronary artery bypass and placement of a stent, non-hemorrhagic stroke, transient ischemic attacks (ischemic stroke), peripheral arterial disease, atrial fibrillation, etc. [2, iii]

Later newer antiplatelet medication emerged such as clopidogrel, ticlopidine, cilostazol, dypyridamole, ticagrelor, prasugrel, abciximab, tirofiban andebtifibatide.These newer drug has higher antithrombotic effect as well as bleeding risk more than aspirin. When oral surgical procedures is planned for these patients both the surgeons and the physicians should weigh the potential bleeding risks in continuing the medications versus the thromboembolic risks in interrupting them before procedure.[iv]

Traditional method of treating these patients is by stopping the antiplatelet medication 7 to 10 days or at least for 3 days prior to the oral surgical procedure.[3]Aspirin begins irreversibly inhibiting thromboxane A2-induced platelet aggregation within 1 hour of ingestion, and clopidogrel selectively inhibits adenosine diphosphate (ADP)-induced platelet aggregation within 2 hours, this lasts for 7–10 days of the mean platelet life[2,4].

If antiplatelet drug is discontinued hypercoagulable state or rebound phenomenon occurs by abnormal increase in production thromboxane A2, increased activity of ADP receptor that involve in platelet aggregation,

decreased fibrinolysis and decreased antithrombin level.[3,v,vi,vii]

. However, this can increase the incidence of fatal thromboarterial events within 10 days of stopping the drugs. Thus the oral surgeons have to maintain the balance between the risk of increased post-operative bleeding and the risk of thromboembolic events. The increase in the risk of thromboembolic events outweighs the risk of post-operative bleeding as it can be managed with local hemostatic measures.[viii]

Extractions of teeth, is unlike surgery in most other parts of the body, have less incidence of encountering major blood vessels. The extracted sockets can be easily accessible to undergo local hemostatic methods such as pressure application (biting on gauze) and using hemostatic materials like cellulose, gelatin foams, gelatamp, hemcon dressing, microfibrillar collagen, sutures, hemostatic solutions, tannic acid, tranexamic acid, and fibrin glue etc[ix, x]

In 19th century antibacterial activity of silver ion is first discovered, in 1920s colloidal silver was accepted by the US Food and Drug Administration (FDA) for wound management. In 1960s Silver again used for management of burn patient in form of 0.5% $AgNO_3$.In 1968 silver was combined with sulphonamide antibiotic to produce silver sulfadiazine cream which acts a broad spectrum silver based antibiotic cream that were widely used for management of burns. Silver based wound dressing also used in infected wound with antibiotic-resistant bacteria.[xi, xii]

. Gelatamp(colloidal silver ion impregnated in gelfoam) is effective against wide range of microrganisms, which are found in the oral cavity. It has been found to be very effective against bacteria, which are resistant to antibiotics. The finely dispersed colloidal silver provides a large active surface for the continuous release of silver ions. As silver does not dissolve easily it is not washed out of the gelatin sponge but is continually released as the sponge is resorbed. This gives Gelatamp a depot antimicrobial effect throughout the resorption process. Gelatamp has the great advantages of both hemostatic and bactericidal effect. It remains in the alveolus and completely resorbed within 4 to 6 weeks.[11]

The purpose of this study is to evaluate and compare the post-operative clinical outcome,such as post-operative bleeding,pain, and wound healing on patients taking aspirin and clopidogrel between Gelatampgroup and non Gelatamp group in the extracted sockets,.

MATERIALS AND METHODS

This is a randomized clinical trial and was approved by the institutional review board and the ethical committee .Informed consent was obtained from all patients before their inclusion in the study. This study was conducted on 88 patients with an age range of 32 to 62 years, who were referred to the Oral and Maxillofacial Surgery department, Best Dental Science College, Madurai.

All patients were cardiac patients and under aspirin or/and clopidegrol therapy with no known or controlled diabetic or/and hypertention, who preferred extraction as a treatment option.

Gelatamp (Gelatampgelatine sponge with colloidal silver Coltène/Whaledent Ltd. President Suite Kendal House Victoria Way Burgess Hill West Sussex, RH15 9NF/U.K.) is made of foam gelatine and finely dispersed (colloidal) silver. Silver forms silver ions in moist conditions. The porous foam structure absorbs its own weight in blood several times over, promotes thrombocyte aggregation due to the large surface and fills the wound cavity. Gelatamp remains in the alveolus and is completely resorbed within 4 weeks. (Figure -)

INCLUSION CRITERIA

Patients' age ranged between (32 - 62) years old of both sexes,

Patients with known diabetic and hypertension under controlled condition.

Patients under aspirin and/ or clopidogrel therapy with INR ≤ 3.5 .

EXCLUSION CRITERIA

Patients who had INR value greater than 3.5,

Patients with history of bleeding disorders or with severe systemic diseases,

Patients under warfarin and heparin therapy,

Immuno-compromisedpatients.

The patients were randomly divided into two groups: group A is a Gelatamp group, where the extraction sockets were packed with Gelatamp and sutured with 3.0 black silk . The allocation of patients into either group was random nonblind as there was no way to mask the Gelatamp group from the control group. Group B is a non-Gelatamp group, where the extraction sockets were sutured with only 3.0 black silk.

A full medical history was taken and an IOPA/ an orthopantogram and clinical examination were performed. Antibiotic prophylaxis was given to all patients one hour pre-operatively, in the form of 875mg Amoxicillin and 125 mg Clavulanic acid. A preoperative INR was performed for all patients on the day of extraction. If the INR was more than 3.5, the patient was excluded from the study.

Group A

Local anesthesia, 2% lidocaine and 1:80,000 epinephrine was given to the patients using standard injection techniques. Dental extractions were then performed as atraumatic as possible, using extraction forceps and elevators when needed. Immediately following extraction the extracted socket is sutured along with Gelatamp pack at the height of alveolar bone. whevever needed the gelatamp is trimmed using scissors to fit inside the socket.

Group B

Same procedures were done as in group A but in this group the extracted sockets were sutured only with 3.0 black silk without placing any haemostatic material into the socket.

Antibiotics were continued three days post-extraction in the form of 875 mg amoxicillin and 125 mg clavulanic acid once a day. Analgesics were prescribed every 8 h for 3 days in the form of paracetomol 500 mg. Patients were given a leaflet outlining the usual post-extraction instructions and a 24-h on-call emergency telephone number to contact if any serious bleeding occurred during non-office hours.

Post-extraction sites were monitored to assess the grade of post-operative bleeding immediately after extraction, 5 minutes, 30 minutes, 2hours after extraction and 1st& 7th post-operative day using bleeding index. Pain scores were evaluated using the Visual Analogue Scale (VAS) where 0 means no pain and 10 being the worst pain the patient had ever experienced. Soft tissue healing is assessed by presence or absence of broken down blood clot, dry socket and inflammation & infection in 7th day. Sutures were removed one week following extraction.

THE POSTOPERATIVE EVALUATION WAS DONE CLINICALLY AS FOLLOWS

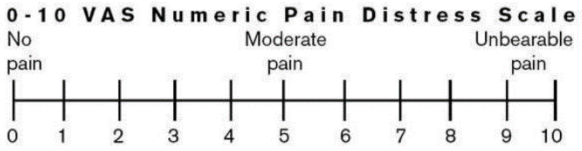
POSTOPERATIVE BLEEDING; Hemostasis was evaluated after extraction by clinical observation using following bleeding index.

Bleeding was assessed postoperatively by bleeding index (maani et al):

Grade 0: Very low (almost no bleeding).
Grade 1: Low (slight oozing of blood from the socket which usually stops by its self or after pressure is applied).
Grade 2: Normal. (Clinically significant).
Grade 3: High. (Bleeding occurs after clot has significantly formed).
Grade 4: Very high (excessive bleeding that could not be controlled by local hemostatic agents or stitches).

POST-OPERATIVE PAIN

Pain was evaluated though VAS (visual analogue scale) at first, third and seventh days postoperatively, taking pain scores from 0 to 10. Patients were asked about the pain severity according to VAS as follow:



POSTOPERATIVE HEALING:

Adequate socket healing was evaluated clinically at the seventh postoperative day including the following clinical obseravtion:

- Presence or absence of broken down blood clot.

- Presence or absence of sign and symptom of dry socket.

- Presence or absence of inflammation and infection

The information collected regarding all the selected cases will be recorded in a Master Chart. Data analysis will be done with the help of computer using **SPSS statistical package-Version 17.**

Using this software range, frequencies, percentages, means, standard deviations, chi square , 't' value and 'p' values will be calculated. 't' test was used to test the significance of difference between quantitative variables and Yate's and Fisher's chi square tests for qualitative variables. A 'p' value less than 0.05 is taken to denote significant relationship.

RESULTS

In this study, 88 patients (age range of all the 88 patients varied from 32 – 62 years old) were divided equally into 2 groups:

Group 1 (study group) consisting of 44 patients and included 24 males and 20 females.

Group 2 (control group) consisting of 44 patients and include 24 males and 20 females.

Table -1 and table -2 shows that both the study and control groups included 38 molars (maxillary molars- 23 and mandibular molar-15) and 6 premolar (maxillary premolars – 3 and mandibular premolars – 3) in the present study.

Table-1 shows number teeth extracted in the study group

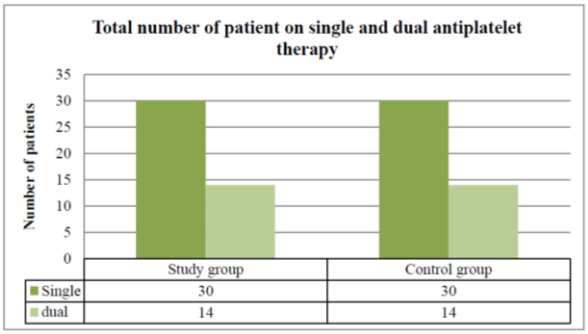
Tooth	Maxillary	Mandible	Total
Molar	23	15	38
Premolar	3	3	6
Total number of patients in study group			44

Table-2 shows number of teeth extracted in the control group

Tooth	Maxillary	Mandible	Total
Molar	23	15	38
Premolar	3	3	6
Total number of patients in control group			44

Chart -1 shows 30 patients were on single (aspirin/clopidogrel) and 14 patients were on dual (aspirin and clopidogrel) antiplatelet therapy in both study group and control group respectively.

CHART-1



POSTOPERATIVE BLEEDING:

Table 1 shows:

- Immediately after tooth extraction, the bleeding grade was recorded after the placement of gelatamp in study group and after suturing the socket in the control group. The p value of this variable is $p<0.562$ which is found to be statistically not significant.
- After 5 minutes, 30 minutes, 2 hours, first and seventh day postoperative the p value were $p<0.793$, $p<0.682$, no p value, $p<0.296$, no p value respectively. It was found that there were

no significant differences between the two groups.

The incidence of postoperative bleeding was higher in the control group (grade 2, 36/44, 81.8 %) than in the control group (grade 2 15/44, 34.1 %) immediately after extraction. The post-operative bleeding after 5 minutes is also found to be higher in control group (grade 1- 31/44, 70.4 %) compared to study group (grade 1 – 12/44, 27.2%) but difference was statistically not significant. In 30 minutes after extraction the bleeding was very less in study group (grade 1- 1/44, 2.3 %) when compared to control group.

Table 1: Comparison of bleeding index between

	Immediate		5 mins		30 mins		2 hrs		Day 1		Day 7	
STUDY GROUP	No	%	No	%	No	%	No	%	No	%	No	%
Grade 0	0	0.0	32	72.7	43	97.7	44	100	42	95.5	44	100
Grade 1	29	65.9	12	27.2	1	2.3	0	0.0	2	4.5	0	0.0
Grade 2	15	34.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Grade 3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Grade 4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
CONTROL GROUP												
Grade 0	0	0.0	8	18.1	30	68.1	44	100	37	84.1	42	95.5
Grade 1	8	18.1	31	70.4	14	31.8	0	0.0	7	15.9	2	4.5
Grade 2	36	81.8	5	11.4	0	0.0	0	0.0	0	0.0	0	0.0
Grade 3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Grade 4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
p VALUE	0.562		0.793		0.682		-		0.296		-	

Chart 2

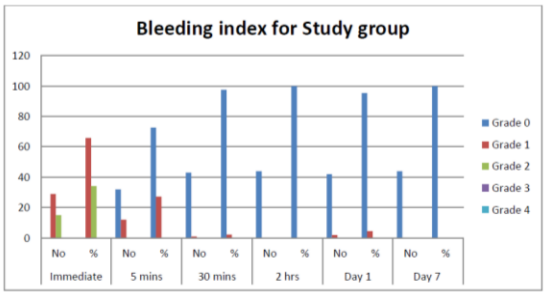
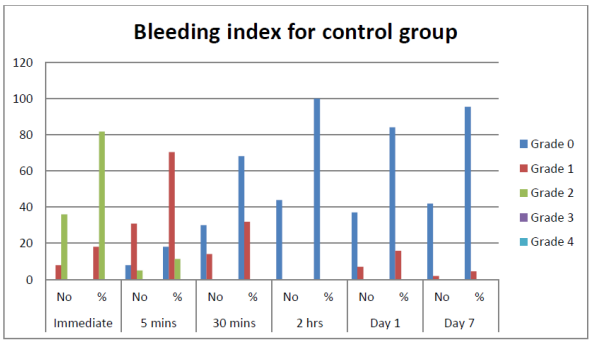


Chart 3



POST-OPERATIVE PAIN:

Table 2 shows the comparison between the two groups regarding visual analogue scale at different periods of follow up. From this table, it

was found that the p value of first and third post-operative day were p<0.079, p<0.194 respectively, which was statistically not significant. The p value of the 7th post-operative day was p<0.011 which was found to be statistically significant.

The post-operative pain scores were less in study group when compared to control group.

In 1st post-operative day study group has mild to moderate pain (score 2 = 21/44 and score 3 = 23/44) when compared to control group which had moderate to severe pain (score 4 = 2/44. Score 5 = 22/44, score 6 = 15/44, score 7 = 4/44, score 8 = 1/44).

In 3rd post-operative day study group experiences a range of no pain to mild pain (score 0 = 1/44, score 1=21/44, score 2 = 9/44) when compared to control group which had moderate pain (score 4 = 10/44, score 5 = 28/44, score 6 = 5/44, score 7 = 1/44)

In 7th post-operative day study group has almost no pain (score 0 = 42/44, score 1 = 2/44) when compared to control group which had mild to moderate pain (score 3 = 8/44, score 4 = 28/44, score 5 = 7/44, score 6 = 1/44)

Table 2 :Comparison between the two studied groups according to pain

	1st	3rd	7th
STUDY GROUP			
Score 0	0	14	42
Score 1	0	21	2
Score 2	21	9	0
Score 3	23	0	0
Score 4	0	0	0
Score 5	0	0	0
Score 6	0	0	0
Score 7	0	0	0
Score 8	0	0	0
Score 9	0	0	0
Score 10	0	0	0
CONTROL GROUP			
Score 0	0	0	0
Score 1	0	0	0
Score 2	0	0	0
Score 3	0	0	8
Score 4	2	10	28
Score 5	22	28	7
Score 6	15	5	1
Score 7	4	1	0
Score 8	1	0	0
Score 9	0	0	0
Score 10	0	0	0
p value	0.079	0.194	0.011

POSTOPERATIVE HEALING:

Postoperative Healing on seventh postoperative Day: Adequate socket healing was detected in all patients of both groups without any sign or symptoms of dry socket, broken down blood clot, and inflammation & infection.

DISCUSSSION

Antiplatelet drugs inhibit aggregation by targeting specific receptor sites and also by inhibiting the synthesis of substances that involves in platelet aggregation. The newer antiplatelet drugs were more potent in their mechanism of action. (Table)

TABLE- 3

ANTIPLATELET DRUG	**MECHANISM OF ACTION**
Aspirin	Inhibits TXA_2 Synthesis
Clopidogrel Prasugrel Ticagrelor	Inhibit ADP Receptor Activation
Dipyridamole Cilostazol	Lowers ca^{++} by elevating cAMP
Abciximab Tirofiban Eptifibatide	Block GP IIb/IIIa Receptor

In this present study extraction was done in patients with INR ≤ 3.5 which is similar to **Broekemaet al (2014)Afriaman et al (2007), Al- Mubarak et al (2007), Morimoto et al (2008) and O. Ross Bierne.**

Little et al., Gaspar et al., and Sonksenet al. claimed that there are no significant post-operative bleedings after dental extractions as long as prolongation in bleeding time remains within acceptable limit (bleeding time up to 20 minutes) preoperatively. These studies were similar to this pesent study because no excessive bleeding was recorded in both the groups in 30 minutes. The present study results were also appear to concur with **Krishnan et al (2008)** where they achieved haemostasis in 30 minutes after extraction continuing antiplatelet therapy.

In this present study the p value immediately, 5 minutes, 30 minutes, 1st day and 7th day after extraction were 0.562, 0.793, 0.682, no p value, 0.296, no p value, respectively. This results was not similar when compared with maani et al, as their study reported p value of 0.34, 0.37, 0.47, nil, 0.60, 1.0 and also maani et al compared the study group with patients who stopped anticoagulant prior to the extraction which is contrary to this present study.

Immediately after extraction, the present study reported 65.9 % of grade 1 bleeding and 34.1 % of grade 2 bleeding which is not similar to maani et al as they reported 8 % of grade 1 bleeding index and 92 % of grade 2 bleeding index of the same. Thus the present study has got better results immediately after extraction when compared to maani et al.

Five minutes after extraction, the present study reported 72.7 % of grade 0 and 27.2 % of grade 1 bleeding index. Maani et al reported near equal results compared to the present study. They reported 76 % of grade 0 and 24 % of grade 1 bleeding index.

In thirty minutes, 2 hours, 1 day and 7 days after extraction, the present study reported 97.7 %, 100 %, 95.5 %, and 100 % of grade 0 bleeding index respectively. Which also similar to maani et al where they reported 100 %, 100 %, 96 %, and 100 % of grade 0 bleeding index for the same. Thus these results were also similar compared to the present study.

Grade 2 bleeding index were reported in 34 % of cases in study group and 81% of cases in control immediately after extraction, in 2 hours after extraction grade 0 were reported in 100 % of cases in both study group and control group, in 1st post-operative day 4.5 % and 15.9 % of grade 1 bleeding index were reported in study and control groups respectively and 4.5 % of grade 1 bleeding index as reported in control group on 7th post-operative day which were managed by pressure gauze itself, but this didn't influence the patient morbidity and mortality. The risk of bleeding under continued aspirin use to increase by 1.5-fold, but that this can be controlled with Gelatamp to obtain earlier haemostasis when compared to control group. No life-threatening complications were reported and no transfusions were required. Hence, there is no need to expose the patient to the risk of thromboembolism or cardiovascular events by discontinuing antiplatelet therapy before extraction.

Most studies fail to evaluate the intensity of pain and wound healing after extraction and none have yet compared the patient's post extraction pain between Gelatamp and non Gelatamp group. To evaluate the pain felt by patients, the current study used a VAS, which is the most widely used pain measurement instrument in many centres. The VAS is a simple, solid, sensitive, and reproducible tool for assessing pain in a given patient at different points in time.

Study (gelatamp dental dressing) group is considered to offer advantages over the control-non Gelatamp group (only suture). However, studies contrasting patient outcome variables in support of these assumptions are lacking. Only one comparison has been made of (study group) gelatamp placement in patient continuing anticoagulant therapy versus (control group) normal suture after extraction in patient who stopped anticoagulant therapy 3 days prior to the procedure. Therefore, the present study also sought to explore patient pain/discomfort, using a subjective visual analog scale (VAS) and wound healing to compare between study group and control group.

The results of this present study shows that the there is a significant decrease in the VAS score of study group when compared to control group with the difference being highest in the 7th post-operative day in both clinically and statistically.

Also the results of this present study shows that the number of patients who felt no pain were also higher in the study group.

In the present study the p value for pain in 1st, 3rd, 7th post-operative day were p<0.079, p<0.194, p<0.011 respectively, which was found to be not similar when compared to manni et al in which they reported p<0.74 for the 1st day, p<1.0 for the 3rd day and no p value for the 7th day.

The pain perception in the study group of the present were found to be mild to moderate in 1st , no pain to mild pain in 3rd and almost no pain in 7th post-operative days. These results were appeared to concur to the maani et al.

In the present study the adequate socket healing were found to be present without any incidence of broken down blood clot, dry socket and inflammation/infection which were also found to be similar to study done by maani et al and also with the above mentioned studies. The limitation of this present study is the smaller sample size. Randomized controlled trials with larger sample sizes are required to confirm the findings of this study.

CONCLUSION

Within the limitations of this study, it can be considered that Gelatamp dental dressing is an effective alternative haemostatic agent with better pain control and wound healing potential after extraction in patients continuing aspirin and/ or clopidogrel therapy provided that the INR range should be ≤ 3.5.

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