



## POST-OPERATIVE BLEEDING IN PERIODONTAL SURGERY: A SHORT REVIEW.

### Periodontology

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### ABSTRACT

Periodontal therapy includes both surgical and non-surgical phase of therapy. Bleeding forms an inseparable part of surgical therapy. Normally, the hemostasis is achieved within 30-60 minutes after surgical procedures through clot formation and maturation. Excessive hemorrhage after initial steps may be due to laceration of small arterioles or capillaries or damage to larger vessels due to surgical invasion of anatomic areas. This may also occur if patient is suffering from any coagulopathy or is on medications or other factors that may interfere with hemostasis.

### KEYWORDS:

Bleeding, hemorrhage, periodontal surgery, post-operative bleeding

### INTRODUCTION:

With the increase in the life expectancy and increased awareness among patients, even the people of old age retain most of their teeth, thereby increasing demand of periodontal therapy.<sup>1</sup> Periodontal therapy includes both nonsurgical and surgical procedures and is a common practice in dental clinics. From the basic procedures like scaling and root planning to extensive periodontal procedures like flap surgeries and periodontal plastic procedures, periodontal therapy play a vital role in the maintenance of entire dentition. Moreover, it also includes surgical procedures related to implant therapy. There are many procedures in clinical periodontics in which bleeding is encountered and body's hemostatic mechanism plays essential role in the formation of blood clot, which is the initial step of healing mechanism in the body.

Haemostasis begins at the site of injury and is accomplished through blood coagulation. When dealing with patients with an increased bleeding tendency, the understanding of this mechanism is of crucial importance. It was Morawitz who first presented a simple two step-four factor model in the early 1900's, according to which prothrombin is converted to thrombin (activated by FIII and FIV), and then fibrinogen transforms to fibrin, activated by the previously formed thrombin (Morawitz, 1905).<sup>2</sup>

### PATHWAY FOR BLOOD COAGULATION (Figure 1):

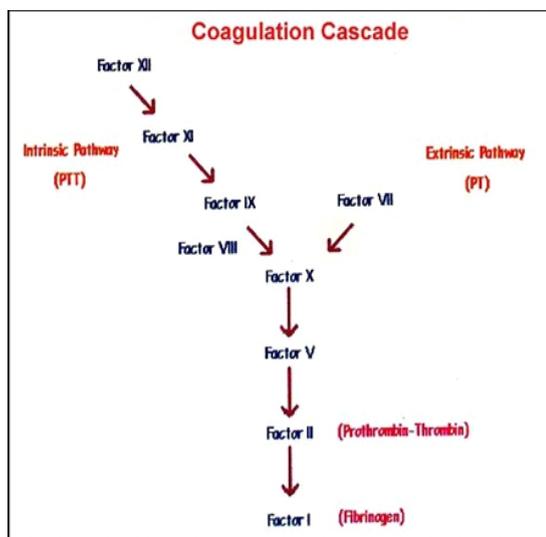


Figure: 1

Haemostasis begins at the site of injury and is accomplished through blood coagulation. Intra-operative and Post-operative bleeding after oral and periodontal surgery is a common complication. The surgical

procedure presents a challenge to the body's hemostatic mechanism.<sup>3</sup> 'Bleeding' is synonymous with the term 'Hemorrhage', which means an escape of blood from ruptured blood vessel. Although bleeding is a common sequelae of periodontal surgery and is usually self-limiting. Following surgical procedures, hemorrhage can range from a minor leakage or oozing at the site, to extensive or frank bleeding at surgical site.<sup>3</sup>

### Classification of hemorrhage:<sup>4</sup>

- Depending upon the source of Bleeding:
  - External Hemorrhage- When the bleeding is revealed and seen outside. Eg. Epistaxis.
  - Internal Hemorrhage- When the bleeding is concealed and not seen outside. Eg. Hematoma following Posterior Superior Alveolar Nerve Block.
- Depending upon nature of Bleeding Vessels:
  - Arterial Hemorrhage- It is bright red in colour and is emitted as a jet with each heartbeat. The bleeding vessels can be identified and secured easily.
  - Venous Hemorrhage- It is dark red in colour. The blood flow is steady and non-pulsatile. The bleeding is difficult to stop because the vein gets retracted.
  - Capillary Hemorrhage- It is bright red in colour. There is generalized ooze of blood instead of blood flow from definite sites. It can cause serious blood loss in disorders like Hemophilia.
- Depending upon the time of Hemorrhage:
  - Primary Hemorrhage- It occurs at the time of surgery.
  - Reactionary Hemorrhage- It occurs within 24 hours of trauma or surgery. In most of the cases, it occurs within 4-6 hours due to dislodgement of blood clot or slippage of ligature. The precipitating factors are:
    - Rise in blood pressure during recovery from shock.
    - Rise in venous pressure due to coughing, vomiting, etc.
  - Secondary Hemorrhage- It occurs after 7-14 days of trauma or surgical procedure. It is due to infection and sloughing of the vessel walls causing moderate to severe bleeding. In most cases, there is a warning hemorrhage in which the dressing gets soaked with fresh blood. It is followed by sudden severe hemorrhage that may prove fatal.
- Depending upon Volume of Blood Loss:
  - Mild Hemorrhage- When blood loss is less than 500 ml (adult patient). This much blood loss is compensated by peripheral vasoconstriction. Hence, there are no significant dynamic changes seen in the patient.
  - Moderate Hemorrhage- When blood loss is between 500-1000 ml. In such a situation peripheral vasoconstriction is not sufficient for maintaining circulation. Hence, there are hemodynamic changes in the form of tachycardia and hypotension. The extremities feel cold and

clammy due to peripheral vasoconstriction.

- Severe hemorrhage-  
When blood loss is more than 1000 ml. The patient have all the feature of moderate hemorrhage due to peripheral vasoconstriction like cold clammy skin, thin thready pulse, tachycardia, and hypotension. If bleeding continues, then due to splanchnic vasoconstriction, there is decrease in renal perfusion leading to oliguria, which may subsequently lead to renal failure. There is also decrease in cerebral perfusion leading to cerebral anoxia that manifests as irritability, unconsciousness and irregular respiration. There is also decrease in cardiac perfusion leading to cardiac ischemia, cardiac arrhythmias and cardiac arrest.

#### RISK FACTORS:

- Patient related factors-
  - Patient non-compliant with post-operative instructions.
  - Tobacco smoking.
  - Alcohol drinking.
  - The tongue may also cause suction of blood by creating small negative pressures that cause secondary bleeding.<sup>5</sup>
  - Tongue being an inquisitive organ may dislodge the blood clot at the surgical site, which initiates secondary bleeding.
  - Lysis of the blood clot with salivary enzymes before it gets organized.<sup>6</sup>
- Certain systemic diseases like Bleeding Disorders, Deficiency of clotting factors as in Hemophilia, Von Willebrand Disease and other factor deficiencies.
- Certain drugs that influence blood circulation such as parenteral anticoagulants, Oral anticoagulants, Antiplatelet drugs (Aspirin, Dipyridamole, Ticlopidine, Clopidogrel).
- Factors related to surgery or healing process that may cause excessive post-operative bleeding.
- Many factors like infection, intrinsic trauma, presence of foreign bodies like splinter of bone, a fleck of enamel, a piece of dental restorative or dressing material that may cause repeated, delayed organization of blood coagulum.<sup>7,8</sup>

#### SIGNS:

- Bleeding within 24 hours after periodontal surgery.
- Presence of liver clot as result of venous bleeding; an incomplete clotting process that slowly develops as a brown-black clot.
- Hematoma or ecchymosis within the soft tissue.

#### SYMPTOMS:

- Continuous bleeding, oozing or pink saliva after 24 hours.
- Difficulty controlling the bleeding with pressure alone.
- Pain.

#### DIAGNOSIS:

- Ask the patient about the onset, severity and duration of the bleeding as well as the compliance with the oral hygiene instructions to verify if any patient related factor initiated the bleeding (e.g.- trauma from brushing, chewing food, vigorous rinsing, spitting, smoking, or trying to explore the surgical site with the tongue).
- Determine the patient's medical history for any bleeding or clotting disorders.
- Question if the patient is taking any medication which can interfere with normal hemostatic mechanism (e.g.- Oral anticoagulants, Aspirin, or any other antiplatelet drugs, etc.)
- Perform an intraoral examination. Determine the location, presentation and severity of bleeding.
- Identification of the cause and the anatomic structures involved will help orient the dentist towards a proper treatment approach.
- The possibility of systemic coagulopathy should be considered if the bleeding proves particularly difficult to control or if the cause cannot be determined. Laboratory investigations such as complete blood count, bleeding time, coagulation time, tourniquet test, international normalized ratio (INR), prothrombin time (PT), and partial thromboplastin time (PTT) can help diagnose such cases reliably.<sup>9</sup>

#### TREATMENT:

- If there is slight oozing of blood
  - Reassure the patient that this is normal within first 24 hours after surgery.
  - Apply continuous pressure to the area with a moist gauze for about 15 minutes.
  - If the patient is consulting on phone, pressure can be applied using a tea bag for 15 minutes.

- Re-assess the bleeding site again and repeat the pressure if necessary.

- If there is bleeding after 15 minutes and the source of bleeding is granulation tissue remaining at the surgical site, remove the granulation tissue by curettage or if there is no granulation tissue remaining and the initially applied pressure is insufficient, then
  - Determine the source of bleeding, irrigation and suction will greatly help in improving the visibility and identifying the source of bleeding.
  - Inject the site with local anesthetic containing epinephrine along with continuous pressure.
  - If the bleeding is from small arterioles and capillaries, suture the bleeding vessel and/or use electro cautery.<sup>10</sup>
  - If the bleeding is from larger arterioles suture the bleeding vessel, in conjunction with electro cautery or diode laser coagulation.
  - Then patient is advice to hold on to a moist gauze for 15 minutes over the bleeding site.
  - If the bleeding is from bone, crush and burnish the overlying bone with bone file, hemostats or rongeur forceps.
  - After the hemostasis is achieved, the patient can be dismissed.

- If the bleeding is continuous and source cannot be determined, hemostatic agents can be used to help control bleeding. These include;

- Absorbable gelatin sponge (Gelfoam) with or without topical thrombin, oxidized regenerated methylcellulose (Surgicel).
- Hemostatic collagen- This includes various products like Helisorb, Collacote, Collatape, Hemocollagene. These agents are soft, white, non-friable, coherent, and sponge like structures which are highly absorbent, thus creating an artificial clot like structure when it comes in contact with blood. They act by aggregation of platelets which bind to the collagen fibrils and degranulate, thereby releasing factors like thromboxane A2 which helps in the clot formation.<sup>11</sup>
- Fibrin glue- It is a cryoprecipitate of human plasma, which serves to anchor a blood clot to surrounding collagen owing to its ability to link fibrin and collagen by Factor XIIIa.<sup>12</sup>
- Other topical applications in the form of thrombin, and tranexamic acid (anti-fibrinolytic agent) can also be used.
- A postoperative appointment may be scheduled one week later for assessment of tissue healing.

#### CONCLUSION:

Periodontal therapy forms a very important part of patient's overall treatment plan. Bleeding is unavoidable consequence when performing surgical phase of therapy. Thorough knowledge of hemostatic mechanism and proper management of intra-operative and post-operative bleeding is of utmost importance. All the factors that may interfere with the body's hemostatic mechanism and the techniques and materials that can be used to manage each case effectively should be well known to the treating clinician.

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