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ENDODONTIC CONSIDERATIONS AND MANAGEMENT OF EXTRAORAL ECCHYMOSIS IN IDIOPATHIC THROMBOCYTOPENIC PURPURA PATIENTS RECEIVING ENDODONTIC TREATMENT: A REVIEW

Dental Science

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ABSTRACT

Dental professionals are being asked increasingly to give high-quality dental care to patients with inherited or acquired disorders that has affected their bleeding and clotting systems. Bleeding disorders are classified as- vessel wall disorders, platelet disorders, coagulation disorders and fibrinolytic disorders. Transient or persistent thrombocytopenia is characterstics of an autoimmune blood dyscrasia known as idiopathic thrombocytopenic purpura (ITP). This platelet disorder of unknown etiology is presented with purple bruises brought on by subcutaneous hemorrhage which is termed as purpura. While some people exhibit no symptoms at all, others do exhibit signs like petechiaes, easy bruising, lower leg bruising, abrupt nasal bleeding, and gingival bleeding. Oral manifestations of this, includes hematomas, petechiae, ecchymosis, telangiectasias, vesicles and hemorrhagic blisters. Dentists need to focus on the management of patients with such disorders which requires a thorough dental and medical evaluation of the patient, prior to treatment, particularly if an invasive dental procedure is being planned. Being and endodontist, present with several complications while treating a patient with such condition, as various problems can be encountered- be it using a Local Anaesthesia prior to procedure or undergoing restorative or surgical treatment. This review focuses on various endodontic considerations that should be undertaken while performing root canal therapy, in general, with patients presenting with given anomaly. Furthermore, complications associated with administration of Local anaesthesia in patients with ITP- formation of ecchymosis and measures taken to prevent it prior, during and post treatment are discussed in detail.

KEYWORDS

INTRODUCTION-

Bleeding disorders affect the way the body controls blood clotting. If the blood does not clot enough, one may experience problems associated with bleeding following an injury or surgery. Platelets play a significant role in haemostasis. Platelets aid in haemostasis through their formation of the primary haemostatic plug, secretion of substances essential for additional platelet recruitment, provision of a surface for coagulation to occur on, release of endothelial repair promoters, and restoration of normal vessel architecture. Platelet dysfunction can result from any disruption in the metabolic processes and events mentioned above which may be genetic or acquired.[13] Bleeding disorders are classified as- vessel wall disorders, platelet disorders, coagulation disorders and fibrinolytic disorders.

Platelet disorders may be divided into two categories by etiology—congential and acquired—and into two additional categories by type—thrombocytopenias and thrombocytopathies.[14] This article throws a light on management of Idiopathic thrombocytopenia purpura patients receiving endodontic treatment.

Idiopathic Thrombocytopenic Purpura (itp)

Thrombocytopenia is defined as a reduction in the platelet count per microliter of blood (less than 150,000 cells/mm3). Thrombocytopenia is brought on by one of three mechanisms: elevated splenic sequestration, fast platelet deterioration, or reduced bone marrow production. Idiopathic thrombocytopenia purpura is a bleeding disorder where the immune system attacks and eliminates platelets, which leads to a lower platelet count in blood and abnormal blood coagulation. This disorder of unknown etiology is also presented with purple bruises brought on by subcutaneous hemorrhage which is termed as purpura. Although the precise etiology of ITP is unknown, there are a number of risk factors linked to this condition, including pregnancy, autoimmune diseases like SLE, the use of certain medications like sulfa medicines, viral infections in children like the mumps and in adults like chicken pox and rubella. While some people exhibit no symptoms at all, others do exhibit signs like petechiaes, easy bruising, lower leg bruising, abrupt nasal bleeding, and gum bleeding.

Endodontic Considerations Of Bleeding Disorders

The oral cavity is the most common site of bleeding, which can show up as hematomas, petechiae, ecchymosis, telangiectasias, vesicles, and hemorrhagic blisters. The mucosa, soft palate, and gums are among the most afflicted areas.[6]

To avoid bleeding-related problems, these disorders must be identified through history, clinical examinations, and laboratory investigations where necessary.[10]

From an endodontist perspective, every step of the treatment process, from isolation to completion, must be managed with the utmost care. Usually, there are no contraindications to root canal treatment provided, the instrument should be within the apical limit and not extend beyond apex.[18,19] Furthermore, it is best to avoid filling beyond the apical seal. Irrigation should be performed with sodium hypochlorite followed by the use of calcium hydroxide paste to stop bleeding. The repetitive placement of film in of intra oral periapical (IOPA) radiographs for determining working length can cause injury and bleeding in oral mucosa. To avoid such situation, working length of the canals should be measured using apex locators.[21,22]

Epinephrine is applied intrapulpally to the apical region, to achieve hemostasis . Factor replacement therapy similar to that needed for oral surgical procedures is applied to endodontic surgical procedures as well.[18]

Rubber dam isolation is advised to reduce the possibility of soft tissue laceration in the operative field and to prevent saliva ejectors or high-speed evacuators from causing ecchymoses and hematomas.[18] It is important to choose a tooth clamp carefully so as to avoid injury to gingiva. Customised cushee rubber dam clamps are silicone stops that assist the inner side of the clamp and protect the gingival tissues from the sharp edges of the clamps.[20]

Management Of Ecchymosis In Patients With Itp Following Local Anaesthesia

According to Statista Research Department, In 2022, there were 208,957 people worldwide who had hemophilia A and around 17,626 people with other platelet disorders. This statistic displays the number of people worldwide diagnosed with a blood disorder by disorder type, as of 2022.[14]

In individuals with ITP, the administration of LA may result in petechiae, ecchymosis, and intraoral or extraoral hematoma. An accurate diagnosis and appropriate treatment of these instances are extremely crucial. Numerous research works have discussed about treatment approaches of both ecchymosis and intraoral and extraoral hematoma.[3,6]

Owing there is a potential risk of intramuscular hematoma formation, perioral and cervical bruises, and anesthetic infiltration following puncture, the main recommendations for the dental care of patients with ITP include performing a platelet count prior to any invasive or non-invasive dental procedures. Due to the possibility of hematoma formation in the retromolar or pterygomandibular areas, a few studies have shown that the use of anesthetic procedures such as inferior alveolar nerve block and lingual infiltrations should be avoided.[6,3]

Management Strategies:

Pre-operative Management-

Research suggests that using a contact cooling device to chill the skin before injection can lower the risk of ecchymosis by 60 to 88 percent.[8,9] Vitamin K injection and platelet replacement therapy, such as Platelet Rich Plasma (PRP) , can be administered to patients before dental procedures[1]. Intravenous immunoglobulin G (IVIgG) administration inhibits the removal of opsonized platelets, most likely by blocking the FccRIIb receptor.[2] Corticosteroids lower the body's levels of autoantibodies and hinder the ability to remove opsonized platelets from the bone marrow and peripheral organs . It is confirmed by numerous prospective, randomized studies that corticosteroids raise platelet counts more rapidly than no other treatment.[3,4] Prednisone at a high dosage of about 4 mg/kg/d for 4 days, or as short a duration as feasible, may minimize adverse effects while maintaining therapeutic benefit in the treatment of ITP.[3]

Intra-Operative management-

When administering LA, use a shorter needle or one with a shallower puncture with slow injection of the anaesthetic salt to be used. Instead of regional analgesia, a buccal infiltration, intraligamental, interosseous or intrapulpal injections can be used as possible alternatives.[5] Aspiration is the most important procedure that must be performed while administering a local anesthetic, either block or infiltrate. Less volume and slower rate of LA administration lower chances of bruising.[8] Nitrous oxide sedation by means of inhalation can be used as a substitute to avoid the need of anaesthesia.[5] In case of inferior alveolar nerve block, the Gow Gate Technique can lower the risk of formation of ecchymosis.[5]

Post-operative management-

Usually, an ecchymosis almost always, naturally resolve over several weeks or months as the body breaks it down through normal processes. Studies report that patients with visible ecchymosis suffer from anxiety and depression and become conscious about their appearance.[23,24] So, it is important for the clinician to emphasize on the treatment protocols if an extraoral ecchymosis occurs. Local measures should be used to control blood loss: splints, gelfoam, oxygel and surgical thrombin. According to certain research, applying 15% hydrogen peroxide carbamide gel reduced discomfort and discolouration associated with bruising. According to the principal investigator's experience, the aspects of bruising that patients often find troubling can be significantly improved when a hydrated gel containing hydrogen peroxide (H2O2), 5 to 20%, or carbamide peroxide (CH6N2O3, hydrogen peroxide combined with urea) gel, 5 to 20%, is applied to the skin under occlusion with an adhesive bandage.[7] Due to the inhibitory impact on platelet aggregation, acetylsalicylic acid and non-steroidal anti-inflammatory medications (NSAIDS) should not be used for post operative pain relief.[6]

Local postoperative cryotherapy in the anesthesia puncture sites, and close observation for any subsequent oral bleeding episodes using guidance and patient-centered communication to be done.[6] Hydrogen peroxide is thought to produce a bleaching effect by its mechanism of breaking light-absorbing double-bonds within color pigments.[7] Cold compression also causes dilatation of injured capillaries leading to subsiding of the bruising. Topical administration of vitamin K8, arnica, or bromelain can decrease the likelihood of formation of an ecchymosis and possibly hasten its resolution.[8] After an injury, the body can expedite recovery and removal of metabolic waste can be done by supplementing with 200–400 mg of the pineapple-derived enzyme bromelain three times a day.[8] Some relevant recommendations in individuals with ITP include the use of antifibrinolytic medications (e.g., tranexamic acid) and local compressive techniques using gauze and obliterative sutures to control bleeding.[6] Additional local hemostatic agents, such as chitosan, bovine collagen, biological (such as fibrin sealant) or synthetic glues based on cyanoacrylate, absorbable alveolar dressings (such as regenerated oxidized cellulose weft, gelatins, gelatin soaked with thrombin, and microfibrilar collagen) can be used for the same purpose.[6] Massage using heparin cream for 5 days without prescription of antibiotics can be given.[11]

CONCLUSION

Restoring the hemostatic system to acceptable levels and maintaining hemostasis using local and adjuvant therapies are steps toward minimizing the challenge to patients with severe bleeding problems.[10] Proper case history taking and evaluation of patients with ITP can reduce possible complications of hematomas and ecchymosis in accordance with successful management if such complications do occur.[6] Dentists must be very carful when using anesthetic block techniques and be prepared to take the appropriate actions when such complications occur.

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