

Bleeding complication after surgical removal of impacted teeth in a patient with undiagnosed clotting disorder

Complicação de sangramento após remoção cirúrgica de dentes impactados em um paciente com desordem de coagulação não diagnosticado

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ABSTRACT

To report one case of bleeding episodes after impacted teeth extractions had been performed in a patient with undiagnosed clotting disorder, describing a sequence of approaches for hemostasis up to the appropriated diagnosis and effective resolution. A male 16-year old patient with surgical indication to remove eight impacted teeth. After the surgery, there were bleeding episodes, being needed for hospital admission to keep on his physiological functions, blood pressure and heartbeat frequency regularly, to carry out laboratory blood tests, and to achieve hemostasis by using antifibrinolytics and blood products. After 24 hours, 11% of IX clotting factor was verified into bloodstream by specific blood test, being diagnosed with mild Hemophilia B. From the diagnosis, infusions of IX clotting factor were performed to the adequate resolution and recovery of the patient. The clinical conducts were efficient to keep on stable vital signs and achieving appropriate diagnosis. However, preventive behaviors should be applied in hemophilic patients in pre- or intra-operative, avoiding circumstances that can compromise health condition of the patient.

Indexing terms: Hemophilia B. Postoperative hemorrhage. Hemostatics.

RESUMO

Relatar um caso de episódios de sangramento após remoção de dentes inclusos em paciente com distúrbio de coagulação não diagnosticado, descrevendo uma sequência de condutas para hemostasia até o diagnóstico apropriado e resolução efetiva. Paciente do

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How to cite this article

Rodrigues Neto HL, Costa TE, Silvares MG, Parente EV, Marlière DAA. Bleeding complication after surgical removal of impacted teeth in a patient with undiagnosed blood dyscrasia. RGO, Rev Gaúch Odontol. 2021;69:e20210038. <http://dx.doi.org/10.1590/1981-863720200003820190152>

gênero masculino, 16 anos, com indicação de remoção de 8 dentes inclusos. Após a cirurgia, houve episódios de sangramento, sendo necessária sua internação para integridade das funções orgânicas básicas, realização de exames laboratoriais, controle hemodinâmico e tentativa de obtenção de hemostasia por meio de antifibrinolíticos e hemoderivados. Após 24 horas de internação, 11% do fator IX de coagulação foi verificado na corrente sanguínea por meio de exame específico, sendo o paciente diagnosticado com Hemofilia B de caráter leve. A partir do diagnóstico, infusões do fator deficiente foram realizadas para resolutividade adequada e recuperação do paciente. As condutas realizadas foram eficientes para manutenção dos sinais vitais até a hemostasia obtida após diagnóstico adequado. No entanto, as condutas preventivas devem ser aplicadas em pacientes hemofílicos no pré- ou trans-operatórios, evitando circunstâncias que podem comprometer o estado de saúde do paciente.

Termos de indexação: Hemofilia B. Hemorragia pós-operatória. Hemostáticos.

INTRODUCTION

Disruptions of blood vessels in situations of trauma can be the causal factors for the acute bleeding [1,2]. The occurrence of hemorrhage can also be determined by clotting disorder, which changes coagulation cascade functionally [3]. The Hemophilia A, B and deficiency of the Von Willebrand Factor represent most of 90% of the cases of coagulopathies [4]. Hemophilia B (Christmas disease) is characterized as a recessive disorder linked to the chromosome X that results in a deficiency in the activity of the IX Factor of the coagulation cascade in its intrinsic pathway, neither breaking nor activating the X Factor [5].

According to Tagamond et al. [6], Hemophilia B is considered a rare pathology and low prevalence, and it is being estimated that 1 subject in 300.000 people could be affected in the world. Hemorrhage's severity is related to the level of activity of circulate factors in the plasma (severe <1%, moderate 1 -5%, mild <40%) [7,8]. As mild, patients rarely presented spontaneous bleeding [9,10]. For moderate, there are reports of higher predispositions of hemorrhagic during or after oral surgical procedures [11]. And, severe ones exhibited occurrences of spontaneous hemorrhagic in joints (hemoarthrosis) and/or in soft tissues [8].

Generally, Hemophilia B can be diagnosed from family health background (bleeding episodes) associated with laboratory findings in coagulogram [5]. The results of the Coagulation Time (CT) and Activated Partial Thromboplastin Time (APTT) can usually be changed in hemophilic B patients. However, laboratory results may present normal values for Prothrombin (PT), Thrombin (TT) and Bleeding (BT) times, which would imply the diagnosis of these patients [9].

Although there are guidelines in surgery procedures (for example the removal of impacted teeth) to minimize morbidity and complications, emergencies can happen because patients might not have known

their illness either clinical history was not enough, or no occurrences of events had been manifested before. In addition, the laboratory exams may present no evidences of clotting disorder [4,12].

Therefore, surgeons should recognize clotting disorder in their patients for either implementation of prophylactic protocols or haemostatic treatment in post-operative even no previous diagnosis [4,13]. The aim was to report one case of bleeding episodes after the removal of impacted teeth in patient with undiagnosed clotting disorder, describing a sequence of clinical behaviors for hemostasis from the postoperative to the appropriate diagnosis.

CASE REPORT

A male 16-year old patient showed up to Division of Oral and Maxillofacial Surgery (University Hospital of *Pedro Ernesto*, State University of *Rio de Janeiro*, *Rio de Janeiro*, Brazil) for a surgical removal of impacted teeth in maxilla and mandible. During the anamnesis, the patient did not report any medical or familiar background of comorbidity factors, blood examination had been required before the surgical procedure. The exam findings did not indicate abnormality (table 1).

Two third superior and two inferior molars, further of three impacted supernumerary premolars in mandible and one impacted supernumerary superior cuspid in maxilla were verified on panoramic radiograph image (figure 1). The patient signed the science and informed consent term for performing surgical procedure.

Surgical procedure

Before the surgical procedure, the patient had taken orally 2 grams of Amoxicillin (Onefarma®, *São Paulo*,

Table 1. Description of the results of the preoperative laboratory exams.

Blood Cell Count	Values (Preoperative)	Reference
Erythrocytes	4,8 million/mm ³	4,5 – 5,3
Hemoglobin	14.4g/dl	13.0 – 16.0
Hematocrit	41.1%	37 – 49
Leukocyte	7300/mm ³	4000 – 10000/mm ³
Platelets	192000/mm ³	140000 – 450000/mm ³
Coagulogram	Values (Preoperative)	Reference
Coagulation Time	7 minutes	5 to 10 minutes
Bleeding Time	1 minute e 30 seconds	Up to 3 minutes
Prothrombin Time	14.4 seconds*	13.6 seconds*
	87.5%	70 to 100%
International normalized ratio	1.07	Up to 1.3
Partial Thromboplastin Time	32.9 seconds*	28.0 seconds*

Note: *Up to 10 seconds above the standard time. The reference values were based in the Brazilian clinical analysis laboratory.

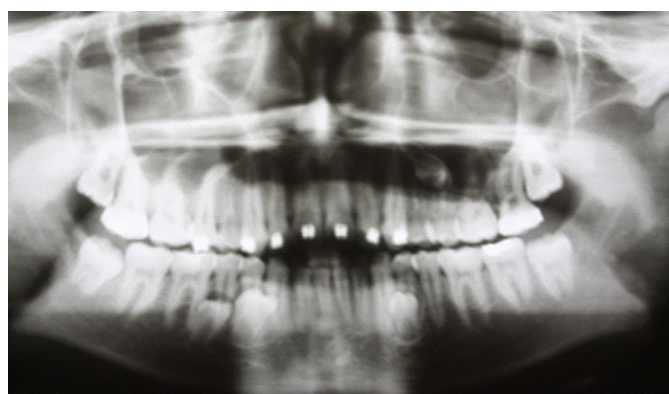


Figure 1. Panoramic radiography showing eight impacted teeth: four third molars, three inferior supernumerary molars and one superior cuspid.

Brazil) and 8 milligrams of Dexamethasone (Medley®, São Paulo, Brazil) to prevent infection and edema in the postoperative, respectively. Furthermore, mouthwash of Chlorhexidine 0.12% (Periogard, Colgate®, São Paulo, Brazil) and antiseptis in periphery of the oral region with Chlorhexidine 0.2% (Riohex®, São Paulo, Brazil) were also performed.

The patient was undergone bilateral local anesthesia of posterior superior alveolar, middle superior alveolar, palatal approach-anterior superior alveolar, greater palatine, nasopalatine, inferior alveolar, buccal and lingual nerves with anesthetic of lidocaine 2% with epinephrine 1:100,000 (Nova DFL, Rio de Janeiro, Brazil). There was no positive aspiration and/or intravascular injections signs.

Incision and mucoperiosteal detachments were performed to exposure bone areas in which teeth were localized. Osteotomies were performed around the crowns by using spherical drill size 06 (KG Sorensen®, São Paulo, Brazil). For impacted teeth, odontosections were done to facilitate the removal of dental fragments by using a drill Zecrya (KG Sorensen®, São Paulo, Brazil) and Apexo 303 elevator (Quinelato®, São Paulo, Brazil) (figure 2A-D). All osteotomies and odontosections were performed by using drills fitted to the brushless motor (Driller®, São Paulo, Brazil) under the irrigation with the saline of 0.9% (Eurofarma®, Rio de Janeiro, Brazil).

At the end of each dental removal, alveolar sockets had been washed with 0.9% saline (Eurofarma®, Rio de Janeiro, Brazil) before verifying hemostasis and suturing with a thread of 4.0 of the nylon type (Procure®, Rio de Janeiro, Brazil). There were no complications during the surgical procedure or any episode of acute bleeding. In the postoperative, the patient remained under attention for 20 minutes with gauze tampons and ice pack on the cheek's regions. They received postoperative medical prescription of Amoxicillin 500 milligrams (Onefarma®, São Paulo, Brazil) and Paracetamol 500 milligrams (Ultrafarma®, São Paulo, Brazil). The patient evolved favorably in the immediate postoperative.

Complications in the postoperative

The patient came back to the Division of Oral and Maxillofacial Surgery in the fifth day of the postoperative

and presented bleeding episodes in the surgical sites (figure 3A-B). No pulsatile bleeding was noted. Firstly, the patient was undergone local anesthesia and hemostasis were reviewed in alveolar sockets, being performed firm

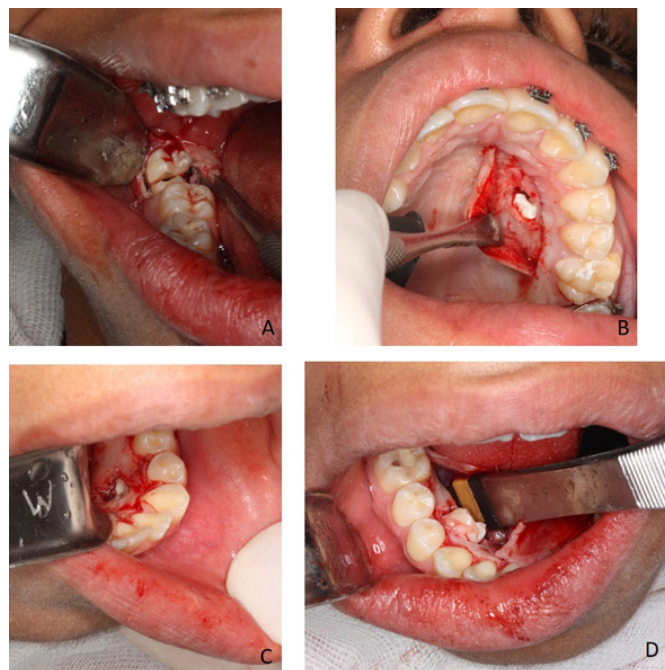


Figure 2. (A) Odontosection in the buccolingual sense in the tooth 48 to remove the sectioned teeth fragments. (B-D) Accesses to mucoperiosteal patchwork to remove the impacted supernumerary teeth in the maxilla and the mandible.

tamponade with sterile gauze and hemostatics were inserted into alveolar sockets, such as microfibrillary collagen (Avitene®, São Paulo, Brazil) and oxidized cellulose (Surgicel®, São Paulo, Brazil). In addition, sutures were renewed in the same parameters previously done.

Even after interventions in clinical office, there was not reduction of the bleeding episodes completely, and the blood loss was not quantified. Thus, the patient was hospitalized in the same hospital to monitor his vital signs, to keep on his airways, to allow appropriate volemic support of blood for hemodynamic stability, to ensure nutritional adequacy and diagnose the etiology of the bleedings. During 24 hours of hospitalization, the vital signs were monitored every 4 hours and presented variations with no deterioration of his physiological state, being the values of the blood pressure between 113/62 mmHg to 123/78mmHg,



Figure 3. Episodes of the bleeding in the surgical access up to the fifth day of the postoperative.

Table 2. Description of the results of the postoperative laboratory exams.

Blood Cell Count	Values (postoperative)	Reference
Erythrocytes	3.9 million/mm ³	4.5 – 5.3
Hemoglobin	10.3g/dl	13.0 – 16.0
Hematocrit	31.0%	37 – 49
Leukocyte	5475/mm ³	4000 – 10000/mm ³
Platelets	153000/mm ³	140000 – 450000/mm ³
Coagulogram	Values (postoperative)	Reference
Coagulation Time	9 minutes	5 to 10 minutes
Bleeding Time	2 minutes e 30 seconds	Up to 3 minutes
Prothrombin Time	15 seconds	13.6 seconds
	70.5%	70 to 100%
International normalized ratio	1.4	Up to 1.3
Partial Thromboplastin Time	37 seconds*	28 seconds*
Liver Function	Values (postoperative)	Reference
Gamma-glutamyltransferase	14 U/L	<55 U/L
Aspartate transaminase	19 U/L	<35 U/L
Alanine transaminase	19 U/L	<41 U/L

Note: *Up to 10 seconds above the standard time. The reference values were based in a Brazilian clinical analysis laboratory.

of the heart beats from 66 to 90 beats/minute, and the temperature from 36 to 37 (°C). The blood exam was performed to measure values of the Hemoglobin, Hematocrit, coagulogram and aminotransferases of liver function (table 2).

Even though no type of measuring of the blood loss had been taken, it was estimated a loss between 15% to 20%. Because of it was verified that the Hematocrit and Hemoglobin values were smaller than those previously ones to the procedure (Table 2). In order to maintain the tissue perfusion, fluid replacements intravenously with 500ml of saline 0.9% (Eurofarma®, *Rio de Janeiro*, Brazil) associated with glucose 5% (Eurofarma®, *São Paulo*, Brazil) were started infusions in each 4 hours. As an antifibrinolytic agent, 1g of aminocaproic acid (NIKKHO®, *Rio de Janeiro*, Brazil) was diluted in 200ml of 0.9% saline (Eurofarma®, *Rio de Janeiro*, Brazil) and infused intravenously (50ml/hour) among breaks of 8 hours. For replacing of the blood products and procoagulants, 2 units of red blood cells or erythrocyts concentrated (01U/300ml), 4 units of fresh frozen plasma (01U/10kg) and 2 units of cryoprecipitate (01/15ml) were transfused in sequence, and respectively, in each 6 hours and lower than one hour. Aforementioned approaches were performed by medical team as well as the prescription of painkillers and antibiotics. The enteral diet was administrated by the nutritionist.

After replacements and blood transfusions, the bleedings continued in a small intensity at night during 24 hours of his hospitalization. The patient remained with headboard of the hospital bed elevated in 45°, ice packs on the face bilaterally, sterile gauze tampons in the surgical sites associated with suction device in the oral cavity.

About 24 hours had passed since hospitalization, peripheral blood material was collected for sending to the Hematology State Institute (HEMORIO, *Rio de Janeiro*, Brazil), which submitted to specific exams for coagulopathies research. The results showed deficiency of the IX clotting factor that categorized the patient as a mild hemophilic B because it featured 11% of the normal coagulation factor in the blood. So, it took place an infusion of 6.6 UI/Kg of IX clotting factor according to the weight of the patient (45kg) to fetch an increase of 50% of the coagulation factor, overcoming bleeding episodes.

After the end of the bleeding episodes and hospital discharge, the patient was evaluated throughout 15 days in clinical office. During this phase of the postoperative, no problem was displayed, and it was verified a good healing in both maxillary and mandibular regions (figure 4).



Figure 4. Regions of the surgical sites with a good cicatrization in maxilla and mandible after the hospitalization discharge.

DISCUSSION

Postoperative bleeding cases are not common among complications of third molars surgery [14]. However, it is important to show that patients in using oral antiplatelet agents or anticoagulants can present a predisposition for bleeding after surgical procedures, being a good option to use local hemostatic agents in order to avoid that complication [15]. Our patient had not passed by a drug therapy or hemorrhage incident before the surgery, and those episodes in postoperative were not related to a disruption of his vessels by professional careless. So, oxidized cellulose and microfibrillar collagen were used as local haemostatics associated with buffering and ice packs in order to achieve an immediate control of the bleeding in a clinical dentistry.

Haemorrhagic complications in haemophilic patients are considered difficult to be treated, and need a specialized and multidisciplinary resolution, in which the hospitalization of the patients is recommended [16]. Even though there has not been a diagnose of this case report yet, we preferred to perform hospitalization admission of the patient, who probably displayed a coagulation problem to undergo blood exams and keep on the vital signs, hydration, nutrition and blood volume.

After the blood exams, haematocrit and haemoglobin were lower than reference values indicating erythrocytes loss caused by bleeding episodes. Chan &

Gara [17] and Carson et al. [18] highlighted importance of blood transfusion when hemoglobin and hematocrit were respectively lower than 7.0g/dl and 30% in exam findings, but red blood cells transfusions can be carried out in cases of hemoglobin values from 7.0 up to 10.0g/dl and acute bleedings. Although the patient has been in a situation of flexible practice of blood transfusion according to these authors, red blood cells transfusions were performed to control its volume and maintain his oxygenation.

Furthermore, bleeding episodes may be related to coagulopathy by a liver disfunction, which could be caused by malfunctioning of hepatocytes in metabolic or genetic diseases [19,20]. However, the results of the exams of the patient ruled out the relationship between low liver function and bleeding episodes.

The patient presented normal values for CT, BT, PT, INR and APTT, which did not suggest any propensity to clotting disorder. One of the possibilities is the fact in which the stimulus for bleeding has taken place because of an alteration in the fibrin formation or in the fibrinolysis stage, being IX clotting factor important to form thrombin [21,22]. Therefore, the normal results of the coagulogram did not show a trend of hematologic alteration in another stage of the coagulation, discarding some clotting disorder which was incompatible with that exam findings. Moreover, it was verified that IX factor value was lower than reference values determining the diagnosis for mild hemophilia B.

When a specific reposition of coagulation factors by blood-derivative and drugs administrations (erythrocytes, platelets) is not possible, there are protocols of infusion with derivates of coagulation factors (such as cryoprecipitate, prothrombin complex concentrate and fresh frozen plasma), which may be used for immediate control of clotting disorder, even if a previous confirmation of diagnosis had not been established by laboratory exams, such as the hemophilia B [23]. Despite infusions of the concentrated erythrocytes had presented some coagulation factors, no diagnosis for hemophilia B determined the administration of the fresh frozen plasma (blood liquid portion rich in proteins, ions and blood coagulation factors in hemostatic levels) and cryoprecipitate (hemocomponent that has the XIII, VIII, Von Willebrand factors and fibrinogen) to reset specific coagulation factors associated with antifibrinolytic agents.

The antifibrinolytic agents (tranexamic acid and aminocaproic acid) are recommended for prior conduct

in patients with clotting disorder before invasive surgical procedures. However, it is necessary more randomized controlled trials with large samples to verify their efficiency [23]. In our case report, those antifibrinolytic agents were administrated with the intention of avoiding damages in the formation of the fibrin clot. Previously to the surgical procedure, it was not performed any antihemorrhagic protocol because the patient did not know a familiar background for coagulation problems and not exhibited laboratory exams with blood alterations. Unknown clotting disorder was related to etiology and maintenance of the bleedings in the postoperative, but it did not prevent that sequential behaviors were done to keep on physiological functions of the patient in attempt to get hemostasis in the surgical sites.

The laboratorial exam for mild hemophilia B allowed associating with disease to bleeding episodes. Generally, patients with mild hemophilia B did not expressed spontaneous bleeding episodes until there has been occurrence of the stimulus such as tooth extraction cases [24,25]. Our patient had not presented bleeding episodes before that surgery or any moment of spontaneous bleeding. And, the preoperative laboratorial exams did not show hematologic alterations. From the hemorrhage occurrence, the postoperative laboratorial exams showed low level of the IX factor (11%), which confirmed the mild hemophilia B diagnosis and a coherence between the case evolution and the information written in the literature.

Genetic or immunological factors must be taken in count to the diagnosis of hemophilia B. Peisker et al. [11] analyzed a serial of tooth extractions in A and B hemophilic patients. Their results showed that reposition of VIII and IX clotting factors could be performed in those patients if levels of factors were lower than 50% – 80% in the preoperative and 30% – 80% until 5 days in the postoperative. On the other hand, that therapy of conventional reposition is not effective for cases in which inhibitor antibodies of the VIII and IX clotting factors are etiological agents of the disease. In these specific cases, the concentrate of activated prothrombin complex or a concentrate of recombinant activated VII factor are good alternatives for those patients [26]. According our case report, the IX factor infusion was effective, because there was no relationship between the immunological system and illness.

Even though sequential behaviors were taken, infusion therapy increased IX clotting factor levels into blood plasma after the surgical procedure, and the patient

was gotten better. Ideal treatment should be performed in the prevention of the haemorrhagic episodes for patients with Hemophilia B, mainly when patients will be undergone surgical procedures [4,13]. Therefore, there are challenges to assist haemophilic patients for the rarity of the clotting disorder and the lack of researches which analysed the efficiency of the treatment protocols [16].

CONCLUSION

Clotting disorder had not been diagnosed yet before surgical procedures, which could be negative factors in the recovery of patients after dental surgeries. In an ideal clinical condition, prevent attitudes must be performed in haemophilic patients to avoid circumstances that can harm the integrity of the patient. Our case report showed adequate preoperative with anamnesis, clinical and complementary exams, which were not enough to prevent complications in the postoperative. However, all clinical conducts were effective in order to overcome bleeding and keep on health status of the patient.

Collaborators

DAA MARLIÈRE had full access to all study data and assumes responsibility for the integrity of said data as well as the accuracy of the data analysis. Study concept and design: HL RODRIGUES NETO, TE COSTA, MG SILVARES, EV PARENTE, DAA MARLIÈRE. Management of the case report: MG SILVARES, EV PARENTE, DAA MARLIÈRE. Analysis and interpretation of data: DAA MARLIÈRE, HL RODRIGUES NETO, TE COSTA. Drafting of the manuscript: HL RODRIGUES NETO, TE COSTA, DAA MARLIÈRE. Critical revision of the manuscript in terms of significant editorial content: MG SILVARES, EV PARENTE, DAA MARLIÈRE

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Received on: 2/11/2019

Final version resubmitted on: 28/3/2020

Approved on: 14/4/2020