Journal of Dental Sciences 20 (2025) 716–717

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.e-jds.com

Correspondence

Tooth extraction after transfusion of fresh frozen plasma in a severe factor XI deficiency (hemophilia C) patient

KEYWORDS
Factor XI deficiency;
Hemophilia C;
Tooth extraction;
Fresh frozen plasma transfusion

Factor XI deficiency (hemophilia C) was firstly reported in the 1950s in four generations of a family experiencing bleeding related to surgery and dental procedures.[1] In this article, we reported a case of severe factor XI deficiency in a 16-year-old female patient who received tooth extraction after transfusion of 2 units of fresh frozen plasma (FFP).

This 16-year-old female patient was referred from an endodontist for extraction of the left maxillary second molar. Intraoral examination and panoramic radiography revealed a large decay in the crown portion of both the right and left maxillary second molars (teeth 17 and 27, respectively, Fig. 1). After consultation with the endodontist, the endodontist decided to perform root canal treatment followed by crown restoration for the carious tooth 17, and suggested to extract the carious tooth 27 because the carious tooth 27 was unrestorable after endodontic treatment. The review of the past medical history found that the patient had a bleeding tendency since childhood. She often complained of easily bleeding while brushing the teeth. However, no joint pain and ecchymosis on the skin were noted. Four years ago, the patient visited the emergency room of our hospital due to uncontrolled nose bleeding. Although the nose bleeding was finally controlled by gauze compression, she was then referred to a pediatric hematologist for further evaluation of her blood clotting function. The blood examination showed normal levels of factors VIII, IX, and Von Willebrand, but the plasma level of factor XI could not be detected. Moreover, the activated partial thromboplastin time (aPTT) was prolonged (84 s, normal range 24–36 s), suggesting that the patient has severe factor XI deficiency. To avoid the uncontrolled bleeding after tooth extraction, a detailed blood clotting function test was performed and showed that the prothrombin time (PT) was 10 s (normal range, 8–12 s), the aPTT was 88.3 s, and the international normalized ratio (INR) was 0.98 (normal range, 0.85–1.15). Because the aPTT was still prolonged, the pediatric hematologist suggested to transfuse 2 units of FFP to the patient before tooth extraction. The re-check of blood clotting function after the FFP transfusion in our patient demonstrated that the PT was 10.3 s, the aPTT was 44.8 s, and the INR was 0.96. Then, the extraction of the tooth 27 was performed by an oral surgeon using an elevator only under local anesthesia in the morning of the next day after the FFP transfusion. In addition, a surgicel absorbable hemostat (Ethicon Inc., Somerville, NJ, USA) was inserted into the extraction socket and then the Fig. 1 suture was performed over the blood clot to avoid active bleeding after tooth extraction. The blood loss was minimal during the whole tooth extraction procedure and the patient discharged one day later. The healing of the tooth extraction socket was uneventful.

Hemophilia C is a rare inherited blood disorder with a prevalence of one case per one million people.[1] There are

https://doi.org/10.1016/j.jds.2024.08.018

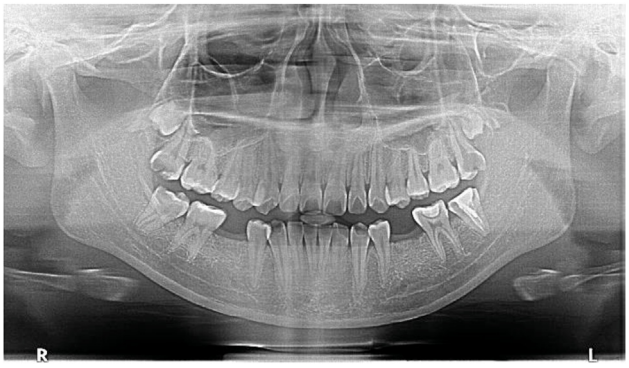

Figure 1 The panoramic radiograph revealed a large decay in the crown portion of both the right and left maxillary second molars (teeth 17 and 27, respectively) in a 16-year-old female patient with severe factor XI deficiency.

three types of hemophilia; hemophilia A has the factor VIII deficiency, hemophilia B has the factor IX deficiency, and hemophilia C has the factor XI deficiency. Unlike the hemophilia A and B patients whose defected genes are located on the X chromosomes, the defected gene of the factor XI deficiency patients is located on chromosome 4.[1] Patients with the factor XI deficiency have an elevated aPTT and a lower or undetected plasma level of the factor XI. According to the guidelines for dental treatment of the patients with inherited bleeding disorders (published by the Dental Committee of the World Federation of Hemophilia in 2006),[2] prevention of dental problems is an essential component of oral care for the patients with inherited bleeding disorders. Brushing the teeth twice daily with a fluoride toothpaste and the regular dental visits are also necessary. For dental treatment of the patients with inherited bleeding disorders, careful use of saliva ejectors and impression materials, placement of X-ray films, protection of soft tissues by rubber dam during restorative and endodontic treatments are suggested because any small trauma may cause the massive bleeding. All oral surgical treatment plans should be discussed with hematologists.[2] Zaliuniene et al.[3] recommended that the inferior alveolar nerve block should be avoided because of the risk of bleeding into the surrounding muscles, which could potentially compromise the airway. The buccal infiltrations, intraligamental technique or interosseous technique could be considered as alternatives to the inferior alveolar nerve block for the hemophilia patients. Invasive operation should be carried out only in the hospital.[3] There is replacement of the deficient clotting factors by intravenous infusion of the factor VIII or IX concentrate to treat hemophilia A or hemophilia B patients, respectively. However, the product of the factor XI concentration which is needed for hemophilia C patient before doing invasive dental treatment is only available in European countries.[1] Thus, we used the FFP instead of the factor XI concentration for our factor XI deficiency patient. Gurcan et al.[4] presented a case of endoscopic urologic surgery in a hemophilia C patient. The patient received 6 units of the FFP before surgery and discharged 3 days after operation.[4] Approximately 14% of all hemophilia patients are initially diagnosed following an episode of severe oral bleeding; thus, the clinicians must pay attention to the patients with a history of unusual bleeding.[2] Although the factor XI deficiency patients are rarely encountered, preoperative evaluation and consultation to hematologist are important to perform invasive treatment to these hemophilia C patients.[1]

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

Acknowledgments

None.

References

1. Lewandowska MD, Connors JM. Factor XI deficiency. *Hematol Oncol Clin N Am* 2021;35:1157–69.
2. Dental Committee, World Federation of Hemophilia. Guidelines for dental treatment of patients with inherited bleeding disorders. *Treatment of hemophilia* 2006;(40).
3. Zaliuniene R, Peciuliene V, Brukiene V, Aleksejuniene J. Hemophilia and oral health. *Stomatol* 2014;16:127–31.
4. Gurcan M, Turan S, Demirel E, Tonyali S. How to deal with hemophilia C in endoscopic urologic surgery: lessons learned from a transurethral resection of bladder tumor case. *Cureus* 2023; 15:e36255.

Hsin-Yang Liang
Department of Oral and Maxillofacial Surgery, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Hualien, Taiwan

Chun-Pin Chiang*
Department of Dentistry, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Hualien, Taiwan
Department of Dentistry, National Taiwan University Hospital, College of Medicine, National Taiwan University, Taipei, Taiwan
Graduate Institute of Oral Biology, School of Dentistry, National Taiwan University, Taipei, Taiwan

*Corresponding author. Department of Dentistry, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, No. 707, Section 3, Chung-Yang Road, Hualien 970, Taiwan.
E-mail address: cpchiang@ntu.edu.tw (C.-P. Chiang)

Received 24 August 2024
Available online 4 September 2024