Management of a Life Threatening Bleeding Following Extraction of Deciduous Second Molar Related to a Capillary Haemangioma

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Abstract

Various forms of vascular lesion affect the head and neck region. The head and neck vascular lesions are classified into neoplasms and malformations. Neoplasm presents either as hemangioma or lymphangioma; neoplasm usually presents in young age compared with vascular malformation. A 9-year-old female patient presented to the outpatient clinic referred from the department of pedodontics after extraction of a right mandibular second deciduous molar. Extraction was done by dental GP in outpatient clinic. Massive bleeding followed the extraction. Bleeding was controlled by electrocoagulation of bleeding site and systemic and local application of antifibrinolytic agent. An intravenous line was placed to provide fluid replacement. Injection of intravenous cyklokapron was given to stabilize the blood clot. Selective embolization was performed 24 hours prior to surgical resection of lesion and the lesion was removed under general anesthesia followed by peripheral ostectomy of bone to remove any feeders. Different protocols are used to control life-threatening bleeding. Primary local measures such as Gelfoam packing, Tranexamic or Aminocaproic topical application, Surgicel application, Electrocautery, Bone wax, Ligation of External Carotid or Common Carotid Artery, or Selective Embolization of feeder vessel may be used to control the bleeding. Interventional radiographic blockage of feeder vessel currently shows high success rate in the management of life-threatening bleeding compared with previous techniques.

Keywords

- ▶ vascular lesion
- ▶ haemangioma
- ▶ selective embolization
- ▶ bleeding emergency
- ▶ pediatric oral surgery

Various forms of vascular lesion affect the head and neck region. The head and neck vascular lesions are classified into neoplasms and malformations.¹ Neoplasm presents either as hemangioma, hemangioendothelioma or angiosarcoma; neoplasm usually present in young age compared with vascular malformation.² hemangioma are further classified into congenital, infantile capillary and venous hemangiomas based on histological and clinical features and various terms were used to describe various forms of hemangioma and several classifications were set.³ Vascular malformations are either high flow or low flow; slow flow lesions are classified into capillary, lymphatic or

venous and the fast flow were classified mainly as arterial malformations.³

Hemangioma is the most commonly occurring tumor in pediatric population. The rate of occurrence of hemangioma is 4% to 10% in the Caucasian ethnic group. Hemangiomas are three to 5-folds more common in females compared with males. The oral and maxillofacial area is the most affected in the whole body; 60% of all Hemangiomas occur in the craniofacial region.⁴

Several methods are used to stop a life-threatening bleeding in dental office. Primary local measures such as Gelfoam

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Fig. 1 A preoperative OPG showing slight displacement of lower second deciduous molar and no bone destruction.

packing, Tranexamic or Aminocaproic topical application, Surgicel application, Electrocautery or Bone wax may be used to stop the bleeding. Ligation of external carotid or common carotid artery may manage uncontrolled major bleeding. Interventional radiographic blockage of feeder vessel currently show high success in management of life threatening bleeding compared with all previous techniques.⁵

Case Report

A 9-year-old female patient presented to the outpatient clinic referred from the department of pedodontics for extraction of a right mandibular second deciduous molar. The molar had a carious decay and was mobile; the mobility was attributed by the pediatric staff to the normal exfoliation process sequence. The patient chief complaint was a small swelling related to the molar which was suspected to be pyogenic granuloma because it was red in color, bleeds on touch, soft in texture and associated with badly decayed tooth. Central lesions were excluded; since, the lesion had no radiographic presentation in orthopantomogram (OPG) (► **Fig. 1**).

The extraction was performed under local anesthesia by the general practitioner (GP) dentist in outpatient clinic. Profuse bleeding followed the extraction. Packing and pres-

Fig. 3 Lesion proliferation post extraction.

sure application failed to control the bleeding episode. As the bleeding, increased emergency measures were taken. High volume suction was advocated to identify the bleeder. The bleeding site was from within the bony socket. Electrocoagulation was applied to control the bleeding site. An intravenous line was placed. Saline was administered to achieve open venous access for volume replacement therapy if needed. Injection of intravenous cyklokapon was done to stabilize the blood clot. Once the bleeding was controlled the patient was immediately referred to the internal medicine department to rule out any coagulation anomalies and perform emergency blood transfusion if needed. The patient's hemoglobin had dropped from 9 md/dl prior to extraction to 6.1mg/dl and had series of transfusion to replace the lost volume (► **Fig. 2**).

The case was referred to interventional radiography. CT angiography was performed which confirmed the vascular nature of lesion but failed to confirm a final diagnosis. The treatment plan placed included selective embolization of the feeding vessels followed by excision of the intraoral lesion. The possibility of ligation of the external carotid was not excluded. The lesion expanded enormously and the patient suffered from recurrent bleeding throughout the patient

Fig. 2 Intraoral photographic image showing the socket post extraction bleeding control.

Fig. 4 Showing an extra oral swelling in right side.

Fig. 5 Angiogram showing vascular lesion related to right side branches of ECA.

preparation phase (►Fig. 3 and ►Fig. 4). Interventional radiographic aids confirmed vascular nature of lesion but failed to confirm a final diagnosis (►Fig. 5).

Selective embolization was performed 24 hours using N-butyl cyanoacrylate synthetic polymer prior to the surgical excision of the lesion (►Fig. 6) and the lesion was removed under general anesthesia followed by peripheral osteotomy of bone to remove any feeders. Post-operative biopsy results showed that the lesion is a capillary hemangioma (►Fig. 7).

Fig. 6 Angiogram showing the lesion site post embolization procedure.

Fig. 7 Intraoral photographic image showing the bleeding site post-surgical resection of lesion.

Discussion

Mulliken and Glowackic classified hemangiomas and vascular malformations giving them significantly different therapeutic approaches. Hemangioma is a true vascular neoplasm histologically formed of multiple blood vessels. On the other hand, AV malformation (AVM) is considered an abnormal communication between arteries and veins. AVM is a result of increased blood flow rather than cell proliferation; hence it is not considered a tumor.¹

The case under study presented with the following criteria: tooth displacement, positive blood aspiration, and rapid growing lesion with high rate of expansion in response to any local trauma as well as the hemorrhagic episode associated with the extraction. An initial diagnosis of AVM was reached in agreement with Kohout et al.⁶

After performing any dental extraction usually, the tooth and socket is examined to be sure that bony architecture and soft tissue architecture is intact. However, in the current case the GP dentist failed in examining the socket because of perfuse bleeding.⁷ Normally, the patient is asked to bite on gauze and is given instruction to avoid clot disruption. If hemostasis is not achieved after 2–3 minutes the wound should be reassessed. However, If the socket keeps oozing after 2–3 minutes of extraction; the blood origin may be vascular, soft tissue or bony in origin. The persistent bleeding should be controlled by electrocautery, ligating, hemostatic gauze, suture, chemical agents (cyklokapron or tranexamic acid) burnishing of bony source of bleeding if possible or inserting bone wax.⁷

The persistent bleeding following those measures is usually of a systemic origin which is either congenital or acquired cause. Congenital defects are either vascular defect as hereditary hemorrhagic telangiectasia, platelets defect as idiopathic thrombocytopenia or coagulation defects as hemophilia. Acquired defects may be associated with liver or renal disease, aspirin therapy, anti-platelet therapy (Plavix), oral anticoagulants (Warfarin) or intravenous anticoagulants (heparin therapy). Transfusion of platelets manages platelets defects, hemophilia disease is managed by providing specific factor replacement and DDAVP, liver and renal disease need referral for adjustment of medical condition, Warfarin action in

reversed by vitamin K administration. Heparin action is reversed by Protamine Sulfate administration.⁸ However, in current case all those regimens were of no concern because the cause of bleeding was local from vascular lesion.

To avoid those accidents; the Points to know section in the Canadian dental association journal Web site answered the important question (How do I manage a suspected oral vascular malformation?)⁹ The article presented some clinical signs which may raise suspicions to a vascular lesion affecting oral cavity as periodontal bleeding, clinical teeth mobility and occlusal plane affection (super eruption of affected tooth).¹⁰ The article recommended a preoperative radiograph for the suspected area, however in current case the radiographic image didn't show any abnormality.¹¹ However, the pediatric staff didn't suspect any incidence of vascular lesions and didn't perform aspiration biopsies.

The life-threatening bleeding was controlled by a protocol advocated by Khanna and Dagum.¹² Initially, air way assessment and preservation was achieved via high volume suction; since 93% of cases presented in Khanna and Dagum review¹² suffered initially from airway affection and needed a definitive airway to resuscitate the patient. After air way securing the bleeding was stopped by conservative means as oral packing, applying pressure over wound, local anticoagulant adjunctive agent's applications as tranexamic acid, gauze, gelfoam and cautery.

Systemic administration of cyklokapron injection was advocated for stabilization of the blood clot. Cyklokapron and Tranexamic acid are used a lot to decrease and control postoperative bleeding. Choi et al used those antifibrinolytic agents to decrease post orthognathic surgery bleeding¹³ and Song et al used it with children undergoing craniostyostosis to decrease the need of blood transfusion.¹⁴

Trans catheter arterial embolization was performed by N-butyl cyanoacrylate synthetic polymer in agreement with Alonso et al¹⁵; prior to the surgical intervention by the interventional radiology team of the hospital. Bouloux et al¹⁶ study showed that Trans catheter arterial embolization replaced conventional extraoral arterial ligation and had more superiority in embolization of inaccessible arteries. Trans catheter arterial embolization showed a 96 percent success rate in controlling of life threatening bleeding as claimed by Khanna et al.¹²

Diagnosis of vascular lesions is usually performed using US color Doppler examination and Angiography.¹⁵ The USS Doppler, CT with contrast and the angiogram confirmed the vascular nature of the lesion. However, no final diagnosis was achievable prior to the surgical intervention.

Different material and protocols of embolization are currently used.¹⁷⁻²⁰ Longacre et al used silicone balls impregnated with barium or tantalum.²¹ Injection of n-butyl cyanoacrylate maybe used and offers more stability.²² Gel foam resorbs in 1-2 weeks so it can be used only as a temporary mean of vessel obstruction. Polyvinyl alcohol which is used usually in embolization and sclerotherapy also causes a permanent obstruction.^{23,24} Immediate intervention and resection within 24-48 hours; must be done to avoid risk of revascularization of lesion.⁴ Post-operative

biopsy showed numerous thin walled vascular vessels lined by endothelium coinciding with histopathological features of hemangioma.²⁵

Conclusion

Minor surgical procedures performed in outpatient clinics may be associated with life threatening bleeding. Dental office armamentarium must include different local measures of management of bleeding emergency. Interventional radiographic blockage of feeder vessel currently show high success in management of life threatening bleeding compared with all previous techniques with minimal morbidity compared with external carotid ligation.

Recommendation

The pediatric staff and the general practitioners should have more training and education regarding clinical steps of screening of oral vascular lesions. Screened out vascular lesions must be treated under hospitals care not in an outpatient clinic to avoid perfuse life threatening bleeding; a preoperative angiogram and selective embolization would have prevented this bleeding episode if the case was properly diagnosed from beginning and a safe tumor excision would have been easily performed with minimal morbidity.

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