

CASE REPORT

Rare post-operative complications in a previously undiagnosed Congenital Factor X deficiency patient

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Abstract

Factor X (FX) deficiency is a rare autosomal recessive congenital bleeding disorder. The clinical presentation is among the most severe among the rare coagulation defects. Thus, majority of diagnosed patients will receive factor replacement therapy before surgical manipulation. However, the diagnosis of FX deficiency may be overlooked because it is a rare entity. This is a case report of a 15-year-old male patient who was diagnosed with FX deficiency after developing post-operative complications. With regular fresh frozen plasma infusion given, the patient responded well and recovered. However, had he been diagnosed earlier pre-operatively, the post-operative complication could have been prevented. Therefore, pre-operative coagulation screening should be performed in patients with significant bleeding history in both emergency and elective situations to prevent surgical morbidity related to post-operative bleeding.

Keywords: Congenital bleeding disorder, Factor X, factor deficiency, post-operative bleeding

INTRODUCTION

Congenital factor X (FX) deficiency is a rare autosomal recessive disorder in which patients usually present with bleeding tendency.^{1,2} The patients with this disorder fail to form sufficient fibrin clot when injury or bleeding occurred. The diagnosis is confirmed by low FX levels and is suspected when there is prolongation of both prothrombin time (PT) and activated partial thromboplastin time (APTT) with corrected mixing study.^{1,3} FX deficiency is one of the most rare congenital coagulation disorders and equally affects both males and females,^{4,5} unlike haemophilia which affects the male gender. Children and adult patients may present with spontaneous mucous membrane bleeding, usually epistaxis and menorrhagia or unusual bleeding following minor or major trauma typically inducing haemarthrosis, haematoma, gastrointestinal and intracranial bleeding. Newborn patients usually presented with umbilical stump bleeding.⁵⁻⁷ Thus, its clinical presentation places FX deficiency and FXIII deficiency as among the most severe of the rare coagulation defects.^{7,8}

Surgical morbidity due to post-operative bleeding in diagnosed FX deficiency patients are not frequently seen since such patients receive FX replacement therapy prior to the surgical procedures. Because of the rarity of the disease, the diagnosis of FX deficiency may be overlooked especially if the bleeding history and pre-operative coagulation screening are not properly obtained. Without therapy, patients may develop serious post-operative bleeding complications such as iliopsoas haematoma. Iliopsoas haematoma has been widely reported in blood coagulation abnormalities mainly in haemophilic or in patients on anticoagulant medication, either spontaneous or secondary to trauma.⁹⁻¹² However, iliopsoas haematoma with femoral nerve lesion in congenital FX deficiency patients has been very rarely reported¹³ and almost all reported cases were due to haemophilia and anticoagulant therapy.^{9,11,14} This report is of a case of iliopsoas haematoma with femoral nerve neuropathy in an undiagnosed congenital FX deficiency patient who underwent abdominal surgery.

CASE REPORT

A 15-year-old male student was admitted with complaints of difficulty in walking due to progressively increasing right hip pain associated with right lower limb weakness and numbness. Five days prior to the presentation, he underwent emergency appendectomy in another health centre. Apparently, the history of bleeding was overlooked and hence, pre-operative coagulation screening was not performed. The patient had no fever and he gave a past history of prolonged bleeding after tooth extraction, easy bruising upon minor trauma since childhood and profuse bleeding following circumcision at the age of 13 years which required blood transfusion. He came from a poor family and was the product of a non-consanguineous marriage. He was the fourth of five siblings. His youngest sister also had bleeding problems after tooth extraction but was not investigated for the excessive bleeding. On physical examination, he was pale and afebrile. The right hip was swollen, tender and in flexion deformity. His right lower limb showed signs of right femoral nerve palsy as evidenced by muscle weakness and reduced sensation of the limb. There was a large haematoma over the appendectomy wound. The other physical examination was unremarkable.

Laboratory findings

His haemoglobin level was 8.4g/dL and the platelet count was normal. Both PT and APTT were markedly prolonged while thrombin time (TT) was normal. Since a bleeding problem was suspected, a detailed coagulation work-up was performed (Table 1). The mixing study showed correction of the initial prolonged PT and APTT, and it was strongly suggestive of factor deficiency. Coagulation factors assay showed moderate FX deficiency with normal levels of other coagulation factors (II, V, VII, VIII and IX). D-dimer was positive while fibrin monomer was negative. The liver and renal function tests were normal. Ultrasound and CT scan of the abdomen and pelvis revealed infected intramuscular haematoma of the right psoas, iliopsoas, iliacus and anterior abdominal wall muscles (Fig. 1). A diagnosis of moderate Factor X deficiency with infected right iliopsoas haematoma and right femoral nerve compression was established.

Clinical course

He was managed with intravenous antibiotic and supported with transfusion of fresh frozen plasma (FFP). He responded well to the treatment in that the femoral nerve symptoms resolved and he was able to ambulate without any support within 1 month. Follow-up CT scans of abdomen

TABLE 1: Coagulation test results of the patient

Test	Patient	Normal control
Coagulation screening		
PT	44.8 seconds	12.6-15.7 seconds
APTT	71.2 seconds	30.0-45.8 seconds
TT	17.3 seconds	11.0-17.8 seconds
Mixing study with normal plasma	Corrected	
a) PT mixing	14.6 seconds	12.6-15.7 seconds
b) APTT mixing	41.6 seconds	30.0-45.8 seconds
Factor assay		
a) FX	5.8 %	50-150%
b) Other factors assay (FII, FV, FVII, FVIII, FIX, FXII)	Normal	50-150%
Fibrinogen	4.93 g/L	2.32-4.44 g/L
D-dimer	2.15 µg/ml	<0.5 µg/ml
Fibrin monomer	Negative	Negative

PT: prothrombin time; APTT: activated partial thromboplastin time; TT: thrombin time; F: factor

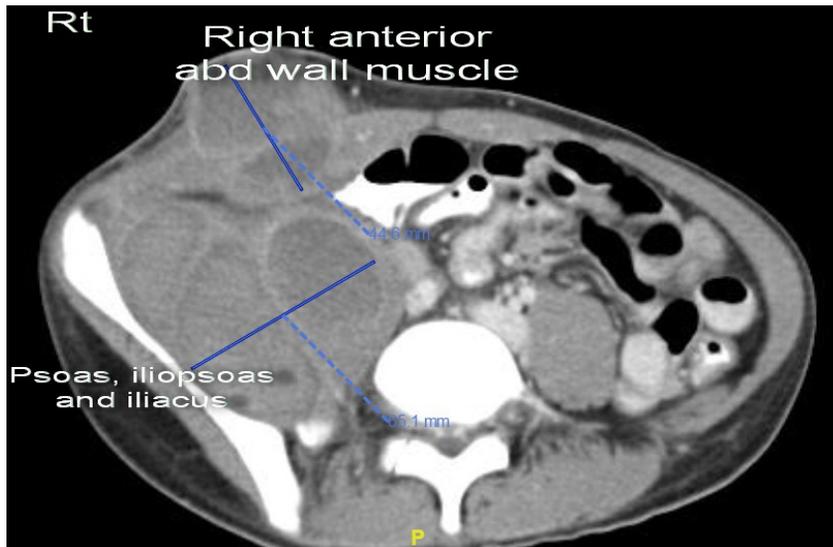


FIG. 1: CT scan of abdomen and pelvis obtained 1 week after presentation showing multiple intramuscular haematoma involving right psoas, iliacus, iliopsoas and anterior abdominal muscles

and pelvis revealed resolution of the iliopsoas haematoma. Unfortunately, this patient had defaulted follow up after 6 months of treatment.

DISCUSSION

This is the first case of congenital FX deficiency to be reported in our centre, which shows the rare entity of the disease. FX deficiency may be caused by deficiency of the protein, presence of non-functional protein or presence of decreased amount of functional protein which could be due to congenital or acquired causes.¹⁵ Congenital FX deficiency is more common in communities with consanguinity marriage such as in Iran, Pakistan and India.^{1,5,16,17} However, our patient was the product of a non-consanguineous marriage.

The classification of severity of FX deficiency is based on the FX activity measurement; a measurement of <1% is categorized as severe, 1-5% as moderate and 6-10% is considered mild.^{1,16} Patients with congenital FX deficiency can present at any age with spontaneous mucocutaneous bleeding including easy bruising, gum bleeding and epistaxis while the carrier state usually remains asymptomatic.¹ Peyvandi *et al* reported that among Iranian patients with congenital FX deficiency, epistaxis was the most frequent symptom in all degrees of deficiency, while other mucosal bleeding (hematuria, gastrointestinal bleeding), menorrhagia, and soft tissue bleeding (hematoma, haemarthrosis) were less frequent and occurred mainly in moderate to severe deficiency.⁵

This patient was diagnosed with a mild to moderate FX deficiency since his FX assay was 5.8%. This explains why this patient only bled after haemostatic challenges such as easy bruising after minor trauma and after tooth extraction (previous medical history) or surgery (current presentation). The patient was diagnosed as congenital FX deficiency from a history of bleeding tendency upon minor trauma since childhood and supported with correction of PT and APTT mixing studies and low FX level. Underlying acquired causes of FX deficiency were excluded such as liver disease, vitamin K deficiency, amyloidosis and drugs usage such as anticoagulant therapy and phenytoin.^{3,18,19}

Liver disease and vitamin K deficiency had been excluded since he had normal liver function and other vitamin K-dependent factor assays including FII, FVII and FIX were normal. The other possibility of inhibitor to FX is very rare²⁰ and was unlikely since PT and APTT mixing study showed full correction. Acquired FX deficiency secondary to amyloidosis also was unlikely since patient had already presented with a history of bleeding tendency since childhood indicating underlying inherited bleeding disorder. Furthermore, one of his sisters also had a history of bleeding problem although she and both of his parents did not turn up for screening and confirmation. He came alone to study in Malaysia and all of his family members reside in his home country. Coagulation screening test was not performed in his family members because his sister and both parents did not turn up for

blood taking. Thus we could only evaluate our index case.

Since congenital FX deficiency is a rare entity and usually all diagnosed patients will receive factor replacement therapy during operative procedures, surgical morbidities such as bleeding complications are rarely seen post-operatively. In this case, failure to elicit significant bleeding history prior to surgery caused the pre-operative coagulation screening not to be performed and thus, factor replacement therapy was not given. Thus the patient developed femoral nerve neuropathy secondary to iliopsoas haematoma as he presented with severe right hip pain and right lower limb weakness. Besides coagulation disorder, iliopsoas haematoma with femoral nerve compression also should be suspected in a patient who is on anticoagulant therapy and experienced sudden onset of pain in the groin or thigh associated with limb weakness.²¹ It was reported that one third of heterozygous FX deficiency who underwent surgery or delivery without prophylactic factor replacement therapy showed post-operative bleeding and required FFP infusion for treatment²² as shown in this reported case. Therefore, bleeding history in every patient should be obtained thoroughly in every patient as post-operative bleeding complication can be prevented.

To date, there is no specific FX replacement product readily available for treatment of bleeding in FX deficiency patients. However, prothrombin complex concentrates (PCC) and FFP can be used for treatment as well as for prophylactic use prior to surgery.¹ Monitoring of FX and FIX levels is required in the postoperative period or during long term PCC treatment to avoid overdose as PCC is known to cause thrombosis.¹ The femoral nerve neuropathy due to iliopsoas haematoma usually resolves spontaneously with rest and regular factor replacement therapy to control new bleeding and pain especially during the first six months of treatment²³ as shown in this reported case.

In conclusion, pre-operative coagulation screening tests before a surgical procedure should be practiced in patients with significant bleeding history and should be followed by appropriate laboratory investigations for confirmation of the haemostatic disorder.

ACKNOWLEDGEMENT

There is no financial or other relationship between the authors that might lead to a conflict of interest in the report of this case.

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