Iatrogenic Pseudoaneurysm Of The Superficial Femoral Artery In A Pediatric Patient: Case Report

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Abstract

A 6-year-old female child presented with a painful, expansile swelling at the medial aspect of her right thigh. Three months earlier she had an open reduction Internal fixation of a closed fracture of mid-shaft of right femur. An angiogram confirmed pseudoaneurysm of the superficial femoral artery caused by overpenetration of the dynamic compression plate screw. It was treated surgically by resection of the aneurysm, reconstruction with inter-positional sephanous vein graft and removal of the hardware. On the last followup at 12 months, the patient was symptom free with resumption of normal activities of everyday life.

INTRODUCTION

Isolated Superficial femoral artery (SFA) pseudoaneurysms occur rarely in younger age group and are mostly post-traumatic, while in older populations, most of these aneurysms are atherosclerotic and often associated with infections, inflammatory, immunologic or connective tissue disorders.[1,2] Most patients with non-atherosclerotic pseudoaneurysms of SFA are asymptomatic initially and later present with a pulsatile, expanding mass along the anatomical course of SFA in the thigh and have a history of some trauma or surgical procedure.[1,9,14] We report a case of a child who developed pseudoaneurysm of the superficial femoral artery following an internal fixation of the mid-shaft fracture of femur.

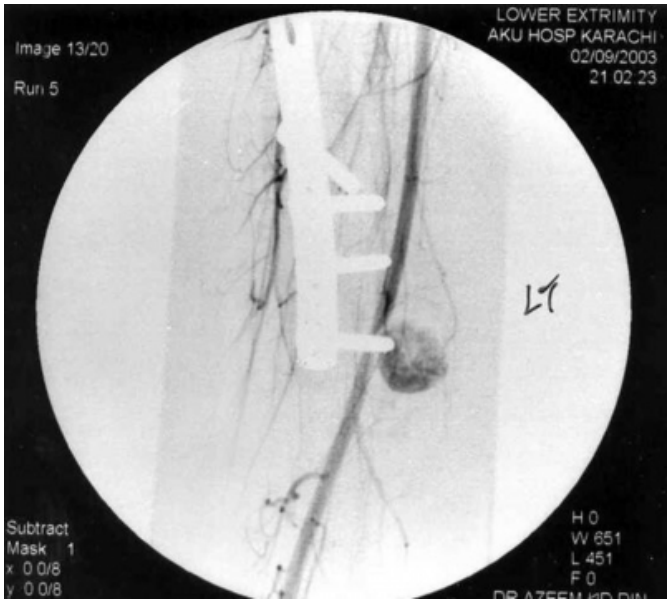
CASE REPORT

A 6-year-old female child sustained a closed mid-shaft fracture of the right femur in a fall while playing at her school. She was immediately transferred to a local hospital where an open reduction and internal fixation (ORIF) was done with a dynamic compression plate (DCP). The hospital course was uneventful and she was discharged a week after the fixation.

Three months after the ORIF, she presented in the emergency room with a gradually expanding swelling on medial aspect of proximal 1/3rd of her right thigh for the past two months. The swelling was the size of a golf ball, pulsatile, moderate to severely tender and soft on palpation with no change in color of the overlying skin. An incorrect anatomical fixation was observed with slight external rotation of the right limb and mild limb length discrepancy; however, there was no gross mal-rotation present. The patient was vitally stable with ESR of 24, white blood cell count of 9.1x 10^9/L, hemoglobin of 10.8 gm/dl, hematocrit of 32.7% and a completely healed fracture on an X-ray. A possible pseudoaneurysm was suspected, and an angiogram was done on the same day which established the diagnosis of a saccular pseudoaneurysm of the right superficial femoral artery with a distal most DCP-screw in contact with it (see Figure 1).

Figure 1

Figure 1: An angiogram showing a saccular pseudoaneurysm of the superficial femoral artery due to overpenetration of a DCP* screw. (*Dynamic compression plate)



Surgical repair of pseudoaneurysm and removal of hardware was carried out the following day by vascular and orthopedic surgery teams. A 2-mm tear was identified intra-operatively in the lateral wall of the mid-superficial femoral artery, and an isolated 1-cm segment of the involved SFA was excised with an end-to-end anastomosis using autogenous sephanous vein graft. DCP was removed from the right femur with satisfactorily healed bone and no signs of infection at the sight of fracture. The histopathology of the aneurysm showed no unusual pathology. The patient was discharged on the fourth post-operative day with an unremarkable neurovascular exam of the lower limb. The patient was followed regularly for twelve months after the pseudoaneurysm repair in which the recovery was uneventful, and the patient has been able to resume her daily activities in a normal fashion.

DISCUSSION

Pseudoaneurysms of the superficial femoral artery in a younger age group are a very rare occurrence. Femoral artery pseudoaneurysms have been described following various orthopedic surgical procedures including internal fixation of intertrochanteric, subtrochanteric, and intracapsular femoral neck fractures, subtrochanteric osteotomy, and interamedullary nailing of the femur.[3,4,5] Some of the false aneurysms may close spontaneously but rupture is a major concern followed by thrombosis, distal embolization and compression of adjacent structures. Christos, et al has described a thigh compartment syndrome due to a false aneurysm.[14]

Angiography and Doppler Sonography are reliable techniques for detection and surveillance of SFA pseudoaneurysms.[1] Advanced radiological interventions like Coil embolization, balloon embolotherapy, stent graft-repair, transducer directed compression and other percutaneous or endoluminal therapies have been successfully used in addition to surgical repair and reconstruction.[5,6,7,8,9,10] Introduction of thrombus and coil embolization procedures can be attempted in arteries that are either minor muscular branches or are perfusing an organ that has a dual blood supply.[1,5] However, in a pediatric age group, percutaneous therapy in SFA is not widely employed because of the extensive expertise required, increased risks and complications related to the procedure.[5] Thus, in this group an elective surgical repair is indicated in almost all the cases.[1,5]

We believe that this complication arose primarily from overpenetration of DCP screw or the drill bit. And more importantly, the unjustified indication for open reduction internal fixation in this type of fracture in a pediatric patient cannot be overemphasized. In this case, a closed reduction and traction of the limb with immobilization followed by a spica cast would have been the management of choice.

CONCLUSION

Our experience from this case emphasizes that a high index of suspicion and a careful clinical assessment is essential if vascular injuries and their complications are not to be missed following an orthopedic procedure or any other extremity trauma. There is also a great need to be more judicious in undertaking decisions involving surgical procedures and executing them meticulously to avoid the risks and complications involved.

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