

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

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Citation

C Sarwar, S Riaz, R Lukhadwala. *Iatrogenic Pseudoaneurysm Of The Superficial Femoral Artery In A Pediatric Patient: Case Report*. The Internet Journal of Orthopedic Surgery. 2003 Volume 2 Number 1.

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 saphenous 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

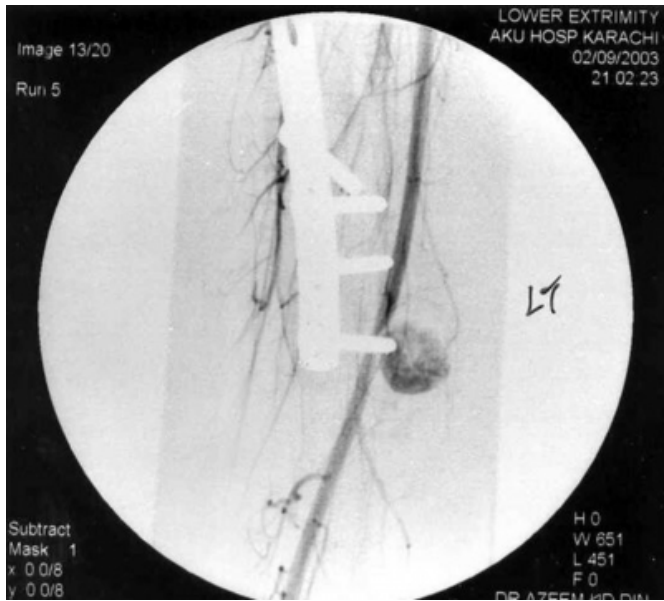
A 6-year-old female child sustained a closed mid-shaft fracture of the right femur in a fall while playing at her school. She was immediately transferred to a local hospital where an open reduction and internal fixation (ORIF) was done with a dynamic compression plate (DCP). The hospital course was uneventful 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 $9.1 \times 10^9/L$, 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 saphenous 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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References

1. Vascular and Interventional Radiology. Karim Valji. 1999 W.B. Saunders Company©.
2. Noncoronary Angioplasty and Interventional Radiologic Treatment of Vascular Malformations. Laszlo S, Juan MT. 1994 Williams and Wilkins©.
3. Wolfgang GL, Barnes WT, Hendricks GL. False aneurysm

of the profunda femoris artery resulting from nail-plate fixation of an intratrochanteric fracture. A case report and literature review. *Clin Orthop*.1974;100:143-150.

4. Nadeem RD, Clift BA, Martindale JP, Hadden WA, Ritchie IK. Acute compartment syndrome of the thigh after joint replacement with anticoagulation. *J Bone Joint Surg*. 1998;80:866-868.

5. *Peripheral Endovascular Interventions*. Rodney AW, Thomas JF. 1996 Mosby-Year Book, Inc©.

6. Ariyoshi H, Miyaso S, Aono Y, Kawasaki T, Sakon M, Monden M. Delayed presentation of superficial femoral artery injury: report of a case. *Surg Today* 2001;31(5):471-3.

7. Sethuraman V, Hozack WJ, Sharkey PF, Rothman RH. Pseudoaneurysm of femoral artery after revision total hip arthroplasty with a constrained cup. *J Arthroplasty* 2000 Jun;15(4):531-4.

8. Feng YL, Truitt RE, Coggins TR, Gura GM, Conn RD, Good TH. Nonsurgical Repair of Femoral Artery Pseudoaneurysm with Color Flow Guided Ultrasound Transducer Compression. *Echocardiography* 1996 May;13(3):297-302.

9. Shih CT, Lai ST, Hwang JH, Yang WY. Pseudoaneurysm of the profundus femoris artery resulting from chronic injury of internal fixation screw. *Echocardiography* 1996 May;13(3):297-302.

10. Sharma NK, Chin KF, Modgill VK. Pseudoaneurysms of the femoral artery: recommendation for a method of repair. *J R Coll Surg Edinb* 2001 Aug;46(4):195-7.

11. Sabharwal T. A review of alternative approaches in the management of iatrogenic femoral pseudoaneurysms. *Ann R Coll Surg Engl* 2000 Sep;82(5):364.

12. Shiuann SL, Steve WNU, Chun HS. Aneurysn-Induced

Intertrochanteric Bone Loss Reconstructed by a Vascularized Iliac Graft: Case Report. *J of Trauma: Injury, Infection and Critical Care* 1999; 46(5):944-947.

13. Minos T, Elias P, Panagiotis M, Elias L. Delayed Diagnosis of a peroneal Artery False Aneurysm at a Concomitant Tibial Fracture. A Case Report. *Cin Orthop Related Research* 1995 july; No.316:211-213.

14. Christos DK, Robert H, Vishal P, Stephen PD. Thigh Compartment Syndrome as a result of a False Aneurysm of the Profunda Femoris Artery Complicating Fixation of an Intertrochanteric Fracture. *J Traum: Injury, Infection and Critical Care* 1999 Aug;47(2):393-395.

15. Yang KH, Park HW, Park SJ. Pseudoaneurysm of the superficial femoral artery after closed hip nailing with a Gamma nail: report of a case. *J Orthop Trauma* 2002 Feb;16(2):124-7.

16. Liao CS, Ho FM, Chen MF, Lee YT. Treatment of iatrogenic femoral artery pseudoaneurysm with percutaneous thrombin injection. *J Vasc Surg*. 2003 Mar; 37(3):701-2.

17. Edgerton JR, Moore DO, Nichols D, Lane BW, Magee MJ, Dewey TM, Mack MJ. Treatment of iatrogenic femoral artery pseudoaneurysm with percutaneous thrombin injection. *Ann Thorac Surg* 2002 Oct;74(4):S1413-5.

18. Lund JM, Clarke JM, Cockburn JF. Medial circumflex femoral artery pseudoaneurysm following total hip replacement treated by coil embolisation. *Eur J Vasc Endovasc Surg* 2002 Aug;24(2):182-3.

19. Trehan VK, Mukhopadhyay S, Uma Mahesh CR, Yusuf J, Suryavanshi S, Arora R. Successful closure of iatrogenic femoral artery pseudoaneurysm: a new minimally invasive technique. *Indian Heart J* 2002 Nov-Dec;54(6):702-4

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