Int J Clin Exp Med 2016;9(2):4764-4766
www.ijcem.com /ISSN:1940-5901/IJCEM0018330

Case Report

Iatrogenic vascular injury of intertrochanteric fracture: a case report

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Received October 22, 2015; Accepted January 16, 2016; Epub February 15, 2016; Published February 29, 2016

Abstract: Vascular injury of the femoral artery after internal fixation of a trochanteric fracture is caused primarily by overpenetration of the drill bit. We reviewed a few case of vascular injury after insertion of a Gamma nail. The site of arterial injury was parallel with the distal locking intramedullary nail. The arterial was immediately injured when locked the distal nail, which lead to bleeding or pseudoaneurysm formation. It is recommended that angiography should be done as sooner as better, when the patients had symptoms of vascular injury.

Keywords: Vascular injury, trochanteric fracture, gamma nail

Introduction

Femoral intertrochanteric fractures are often seen in the elderly and are usually treated by internal fixation [1]. Despite improved techniques, failure of fixation is still a problem in unstable proximal femoral fractures, which attracts the attention of major orthopedic trauma surgeon. However, to our knowledge, there were only few studies involving iatrogenic vascular injury of the fracture treated by the Gamma nail has been reported [2-11].

Case report

We treated a pseudoaneurysm of the deep femoral artery after internal fixation of a trochanteric fracture, which has been reported in a few literatures [2-10]. An 87-year-old man developed sudden pain and immediate swelling in his left leg when climbing stairs. The patient's past medical history included coronary heart disease and chronic obstructive pulmonary disease. At assessment, he was unable to weight bear, perform any active lower extremity movements. Plain radiographs showed a typical femoral intertrochanteric fracture (**Figure 1**). The patient underwent closed reduction and internal fixation 3 days later. Fixation was achieved with the Gamma nail (Stryker, Hopkinton, MA) (**Figure 2**). It was a successful surgery with only intraoperative bleeding of 100 ml. The patient complained sudden pain of the upper left thigh pain when having exercise, with continuing limb swelling c. The angiography was implemented in emergency room, which showed deep femoral artery injury (**Figure 3**). Intraoperative embolization was done to stop bleeding (**Figure 4**). Three days postoperatively the patient was asymptomatic with a full range of movement (**Figure 5**).

Discussion

Yang et al [11] firstly reported the pseudoaneurysm of the superficial femoral artery after closed hip nailing, in which a seventy-five-year-old woman with left femoral intertrochanteric fracture was accepted an Asian-Pacific type Gamma nail (Howmedica, Schonkirchen, Germany, eleven millimeters in diameter, inclination angle of 130 degrees) successfully. On the fifth postoperative day, she began to feel moderate pain in the mid thigh. The pain was controlled by analgesics after normal radiographs of the femur. Fourteen days after the operation, a moderately sized mass was found in her mid thigh associated with a palpable thrill of the femoral vessels. Following angiography identified a pseudoaneurysm of the superficial

Figure 1. X-ray of left intertrochanteric fracture.

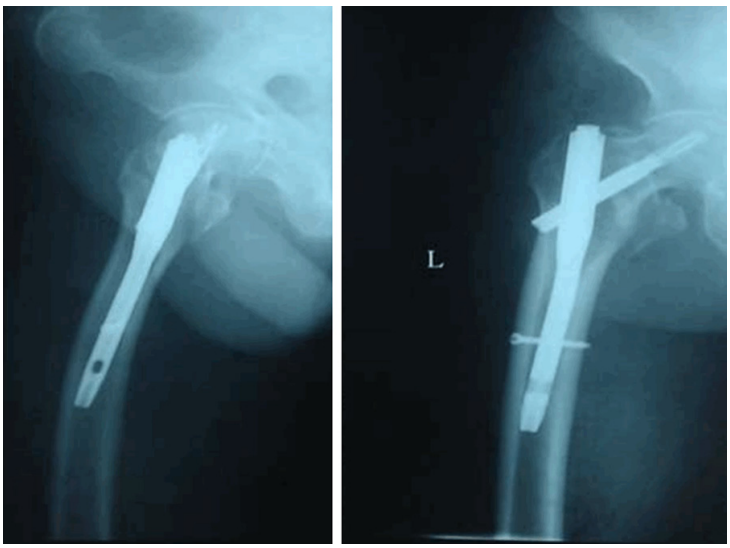

Figure 2. Postoperative anteroposterior and lateral radiographs of the hip.

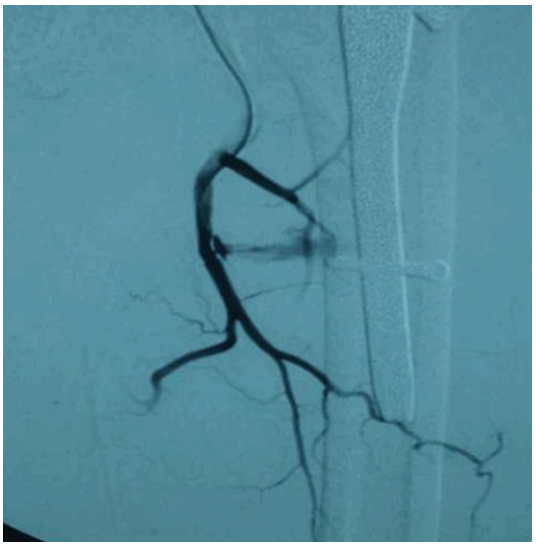

Figure 3. Intraoperative angiography revealed deep femoral artery injury.

femoral artery at the level of the interlocking screw. Twenty days after she underwent a percutaneous transluminal angioplasty to close the neck of the pseudoaneurysm by stent-grafting successfully. The author recommended that the position of the limb should be maintained in a neutral position (no adduction and internal rotation) during preparation of the interlocking hole, which can reduce the risk of vascular injury. As doctors who have finished nearly 500 such fractures, we found it has little clinical value in practice. The most important thing is, we should have good hand feeling of penetration of opposite bone cortex, when locking the distal nail. Furthermore, when the patients had symptoms of vascular injury, angiography should be done as sooner as better, which is used not only for diagnosis but also for treatment.

From all the limited literature till today, we can see that pseudoaneurysm of the deep femoral artery were more common than superficial femoral artery. And almost all the item of arterial injury was parallel with the distal locking intramedullary nail. Although the arterial was immediately injured when locked the distal nail, which leads pseudoaneurysm formation, the aneurysm itself often ruptures several days later when the patients have exercised. Their first sign was continued pain which may be controlled with drugs, which followed by continued limb swelling. However some doctor cannot pay attention to it, resulted in delayed treatment. We suggest awareness of the existence of this complication, and conduct timely angiography when it happened.

Conclusion

We reported an iatrogenic vascular injury of intertrochanteric fracture, and advise that angiography is an effective way to diagnose and treat the disease.

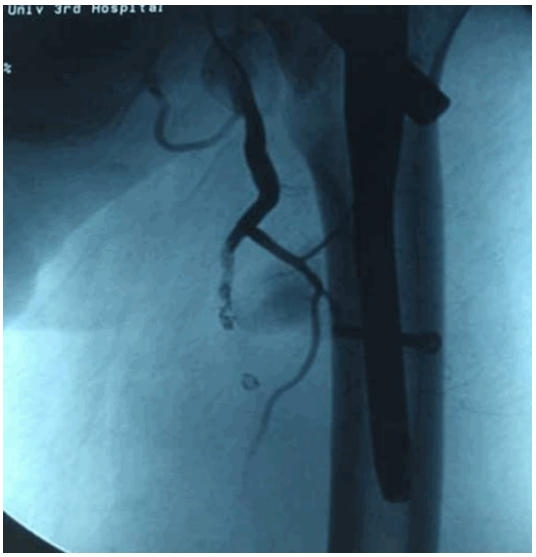

Figure 4. Intraoperative deep femoral artery embolization.

Figure 5. The left leg was normal three days later.

Disclosure of conflict of interest

None.

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