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Pseudoaneurysm in posterior tibial artery: A rare complication in fracture tibia fibula treated with fasciotomy and external fixator

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Abstract

A case of post-traumatic posterior tibial artery pseudoaneurysm following a fractured tibia and fibula with acute compartment syndrome was treated with fasciotomy and external fixator in 17-year-old female. She was investigated for gradual onset boggy swelling after 7 weeks after the initial injury and fixation and diagnosed with an aneurysm at lower limb CT angiography contrast leakage was noticed radiologically (Fig 4). This rare complication of fracture tibia and fibula has to be considered in patient presenting boggy gradual swelling treated with external fixator application following the safe zone of pin insertion proximally.

Keywords: Aneurysm, posterior tibial artery, fasciotomy, external fixator, angiography

Introduction

Pseudo aneurysm is the localized hematoma that is communicated to the native artery via neck, this ballooning of artery is due to arterial wall disruption which may be due to trauma by bony fragment or iatrogenic during pin insertion. The patient may present with symptoms of swelling, bruising, pain, and bleeding from the pin site also neurological symptoms due to nerve compression (Commoner in a femoral and popliteal aneurysm), onset of symptoms depends on the size, rate of expansion, and its relation with the nerve. Few cases of aneurysm of the posterior tibial artery have been reported but very few pseudoaneurysms of the posterior tibial artery have been reported following trauma and pin insertion. The diagnostic option of CT angiography before the bone fixation can help to differentiate traumatic and iatrogenic following tibia fibula fracture with compartment syndrome. Treatment options include surgical repair and ligation or intervention radiological by USG guided thrombin injection and percutaneous endovascular repair with stents.

Case Report

A 17 year old female comes to trauma center following vehicular trauma presented with pain and swelling in her right leg without any previous chronic illness. Distal pulses of right leg were feeble and pain on passive movement were there. Fasciotomy of all four compartment was done through medial and lateral incision. (Fig 1) and there was no evident vascular injury encountered. In the same sitting external fixator including two proximal and three distal schanz screw were used following the safe zone of insertion. Patient was discharged after three post op days, without any fresh complaints.

Later after 7 weeks, she presented with boggy swelling (Fig 3) and pain at proximal site of schanz pin, Hemoglobin was 5.3 g/dl (At the time of discharge hemoglobin was 9.1 g/dl). The external fixator was removed under sedation. On further evaluation, she was diagnosed with PTA pseudoaneurysm on angiography (Fig. 4), under observation and surveillance of a vascular surgeon, intramedullary interlocking tibia nail was introduced (Fig 5). Postoperative no bleeding was encountered. Distal pulses dorsalis pedis and posterior tibial artery were palpable. The patient was ambulatory with aid while discharging. (Fig 6).

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Fig 1: Pre op X ray

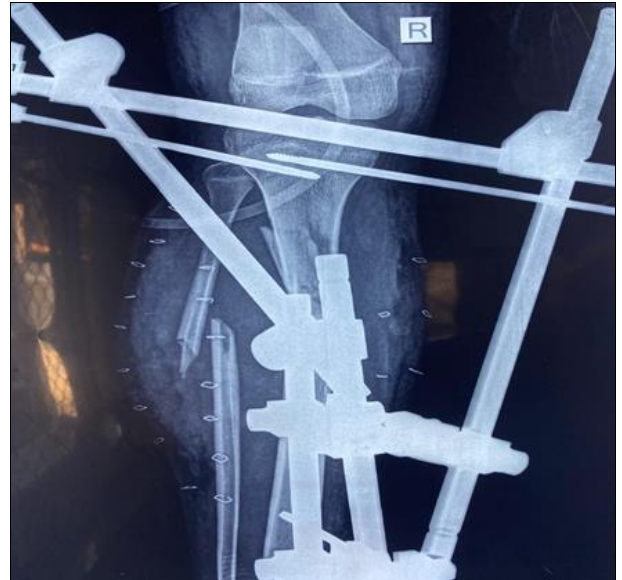


Fig 2: Post op X ray



Fig 3: Post op Clinical Image after 7 weeks



Fig 4: Angiograph images



Fig 5: Revision fixation post op x ray



Fig 6: Clinical image after revision fixation

Discussion

In this case posterior tibial artery pseudoaneurysm is suspected due to either sharp bony fragment causing arterial injury or the iatrogenic as it is recognized but uncommon^[5] and late manifestation of vascular injury associated with tibia and fibula fracture, pseudoaneurysm are more common with blunt trauma and penetrating injury (Stab, bullet injury).

Sharp edges of bony fragments or during implantation which may transect the arterial wall leading to local hematoma formation with subsequent degradation of enclosed vessels.

Most commonly investigation performed are arteriography followed by CT angiography and Doppler ultrasound. CTA delineate the lesion size and margin, however CTA is not used routinely in orthopaedics due to presence of metal hardware.

Management options for traumatic pseudoaneurysm are open surgeries^[4] involves achieving proximal and distal vascular control, followed by evacuating hematoma, arterial wall defect repair by primary closure or secondarily venous patch graft, endovascular coil^[6] embolization can be perform before rupture. Other options includes ultrasound guided occlusion with thrombin injection. If definitive orthopedic intervention is plan to be done, it should be under surveillance of vascular surgeon.

This patient presented 7 week later the initial trauma in anemic state having boggy swelling and pain around external fixator pin site. We suspect differential etiology of pseudoaneurysm of PTA due to either traumatic or iatrogenic in our case during external fixator pin drilling despites the pin inserted in safe zone.

Conclusion

Traumatic and Iatrogenic injury to posterior tibial artery during drilling of schanz screw insertion both are potential cause of pseudoaneurysm in our case. Early suspicion and screening by doppler or CT angiography should be one in fracture tibia fibula having compartment syndrome feature as pseudoaneurysm can obscure the USG window due to blood clots, to identify vascular pathology. Intervention by CTVS surgeons or radiologists are the wise decision to be made in early suspicion. Definitive fixation of the bone is suggested to be done in presence of vascular surgeon as in our case.

Review of Literature

Singh D *et al.* (2013)^[2] reported a case of posterior tibial artery pseudoaneurysm in a 23 year old patient sustained from a laceration and associated profuse arterial bleeding. Because of the risk of rupture and the presence of infection

and high venous flow embolization of aneurysm proximal and distal was carried out.

Consent

Written inform consent was obtained from patient's parents as patient was minor, for publication of this case report and accompanying images.

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