Case Report

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Pseudoaneurysm of Distal Anterior Tibial Artery after Minimally Invasive Percutaneous Plate Osteosynthesis for Distal Tibial Fracture: A Case Report

Karki NB, Paudel S, Adhikari S, Pokharel RK

Department of Orthopaedics, IOM-TUTH, Kathmandu

ABSTRACT

Traumatic pseudoaneurysm of anterior tibial artery is a rare condition after operative intervention of tibial shaft fractures. Few authors have reported proximal anterior tibial artery pseudoaneurysm after intramedullary interlocking nailing and minimally invasive percutaneous osteosynthesis but the incidence of distal anterior tibial artery pseudoaneurysm after minimally invasive percutaneous osteosynthesis is very rare with just one case being reported in literature. We report a case of distal anterior tibial artery pseudoaneurysm after minimally invasive percutaneous osteosynthesis done for distal tibial shaft fracture and discuss its probable cause and management.

KEYWORDS: anterior tibial artery, MIPPO, pseudoaneurysm

INTRODUCTION

Pseudoaneurysm (PA) occurs when a damaging force is applied to arterial wall, allowing persistent extravasation of blood into surrounding connective tissues that communicate with arterial lumen. Distal tibia is distinctive for nonunion secondary to its limited soft tissue envelope. MIPPO technique was developed to safeguard extra osseous blood supply and improve union rates.There can be injury to large neurovascular bundles although microvasculature is preserved in less invasive exposures, as they do not provide direct visualization of these critical structures. Few cases of pseudoaneurysm of anterior tibial artery of proximal tibia after MIPPO, IMIL,[1]Steinmann pin insertion[2] have been reported, but the pseudoaneurysm of distal anterior tibial artery are rare except one that was caused by reduction using tenaculum forceps.[1, 3] We report a case of pseudoaneurysm of anterior tibial artery in distal third tibia.

CASE REPORT:

A 28 yrs old male presented with complaints of a swelling on distal part of leg to our OPD. He had a RTA 8months back when he sustained a closed fracture of distal third tibia fibula. He was managed with the MIPPO technique for the fracture at a local hospital. After 2 months of surgery, he developed a swelling over distal third of leg on lateral aspect. The swelling was not painful but gradually increased in size and was associated with discomfort. On clinical examination, the swelling was about 3*3 cm over distal/3rd region of lateral aspect of tibia. The swelling was non-tender, non mobile, compressible and pulsatile. On auscultation, bruit was appreciated. Distal pulses and neurology was intact. USG Doppler showed features suggestive of pseudoaneurysm of anterior tibial artey around fracture site. Vascular surgery consultation was done and advised for CT angiography which revealed approximately 2.7*2*3.1 cm sized contrast filled focal outpouching in communication with right anterior tibial artery at fracture site.

After adequate patient preanaesthetic preparation, under spinal anaesthesia, exploration of the site via longitudinal incision overlying the swelling was done. Intraoperatively, a false wall clotted

blood mass was identified and removed near the site of screw exit site of proximal 2nd screw. Ligation was done at anterior tibial artery pseudoaneurysm site proximally. Closure was done after obtaining adequate hemostasis. The swelling resolved after surgery. Antibiotics were started and wound dressed at 5th postoperative day after which patient was discharged. He was advised for follow up at the time of suture removal.

Fig 1: Clinical imaging showing swelling at distal third leg lateral aspect

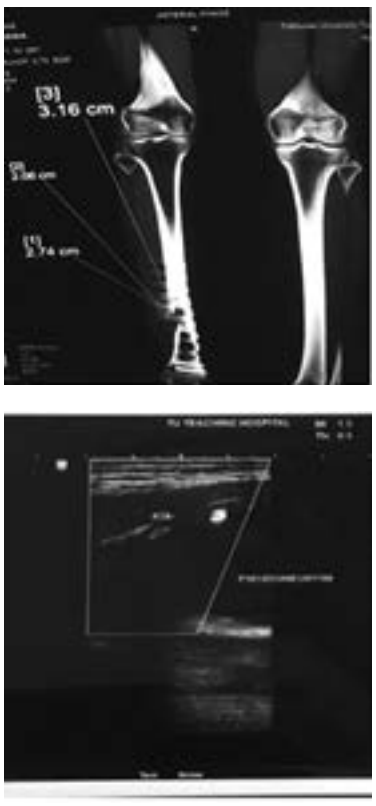

Fig2: CT angiogram and USG of anterior distal tibial pseudoaneurysm site

Fig 3: Intraoperative photos of pseudoaneurysm

DISCUSSION

Pseudoaneurysm is caused by any kind of vascular damage caused by infection, trauma and iatrogenic injury. PA is initiated by a full-thickness tear or laceration of an artery. All three arterial layers are injured, subsequently leading to hematoma formation, inflammatory reactions, and local tissue degeneration, which later result in the formation of the PA. Blood enters the hematoma during systole and leaves during diastole, causing the hematoma to pulsate within the tissues. Ruptured PA into a closed osseo-fascial compartment may present with clinical features of the compartment syndrome.[3,4] False aneurysms are distinguished from true aneurysm by wall composed of fibrous tissue rather than true arterial wall. As it enlarges, may be mistaken for abscess or neoplasm.[5]

Anterior tibial artery is a branch of popliteal artery that arises at the distal border of popliteus muscle. In the upper part of its course, anterior tibial artery lies deep along the lateral border of the tibialis anterior muscle with distance kept from the tibia. The distal part of anterior tibial artery is morevulnerable to injury because it directly adheres to tibia and lies at close proximity to lateral cortex of tibia. Minimally invasive osteosynthesis (MIPPO) is a commonly done procedure because preservation of blood supply around fracture site has several advantages like rapid healing and reduced infection. The percutaneous reduction of fracture by tenaculum forceps is an essential step of MIPPO before drilling and screw insertion. One case report is available of anterior tibial artery pseudoaneurysm after reduction of spiral fracture of distal tibia by tenaculum during MIPPO.[3]

The presently reported pseudoaneurysm was probably due to traumatic injury during drilling or screws or may be due to pointed forceps of tenaculum during reduction. A surgeon should keep in mind that distal anterior tibial artery is close to lateral surface of tibia.[6] During the procedure, a pointed bone reduction forceps can be safely inserted through small incision identifying the lateral cortex of distal tibia to prevent arterial injury.

This report is published for surgeons to be aware of this complication during and after surgical intervention. Surgeons who encounter this complication will also be aware from our report in making appropriate diagnosis and management of this complication. Since pseudoaneurysm tends to progress gradually, it may take several weeks or even months to be noticed. Suspicion for the possibility of pseudoaneurysm, in addition to peroneal palsy, hypoesthesia should always be considered when patients complain of pulsatile mass near the fracture site and wound.

Consent was signed by the patient.

Conflict of Interest: none

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Address for correspondence:

NETRA BAHADUR KARKI

Department of Orthopaedics, IOM-TUTH, Kathmandu

Phone Number: 977-9846290155

E-mail: drkarkinetra@gmail.com