

Pseudoaneurysm of the Anterior Tibial Artery

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Abstract: Traumatic aneurysms can occur anywhere in the body, and is caused when the vascular wall of the underlying artery is subject to injury. They usually follow a penetrating injury, like that involving a knife, a projectile object or any foreign body projected as a missile. Uncommon causes include a blunt injury with no open wound. We present a case of a 17 year old boy who came with complaints of swelling in the antero-lateral aspect below the left knee for the past one week following a history of blunt trauma. Diagnosis of anterior tibial artery pseudoaneurysm was made on computed tomography (CT) and magnetic resonance imaging (MRI) and confirmed reoperatively.

Keywords: Pseudoaneurysm, anterior tibial artery, hematoma, tibialis posterior muscle

INTRODUCTION

An aneurysm is a sac filled with blood in direct communication with the interior of an artery. Based on etiology aneurysms are grouped into four categories

- Degenerative,
- Inflammatory
- Mechanical (which includes traumatic aneurysm) and d) Congenital

Depending on the type of the structure they are classified into two categories.

- True aneurysm: True aneurysms are caused due to dilatation of an artery
- False aneurysm: False aneurysms are sacs lined by condensed cellular tissue which communicates with the artery through an opening in its wall. Traumatic aneurysms are usually false aneurysms.

Traumatic aneurysm of the anterior tibial artery is a recognized but very rare complication of pediatric vascular trauma[1].

CASE REPORT

A 17 year old boy came with the complaints of swelling in the left leg for the past one week. The patient was apparently normal when around 15 days back, he had fallen down and had sustained a penetrating injury to the left leg below the knee, for which he was treated conservatively. Around a week back, the patient again had an alleged history of fall, and had sustained an injury to the same area, following which he developed a swelling in the affected region. There was no history of fever, pain or discharge from the site of the swelling.

The general examination of the patient was within normal limits. On local examination, the swelling was found in the antero-lateral aspect of the left leg below the knee, was oval in shape, around 6 x 5 cms in dimension, with a smooth overlying surface and a bluish discoloration. On palpation, the swelling was warm and firm in consistency with transmitted pulsations. Thrill was absent. Proximal and distal pulsations of the arteries were felt and were normal. On auscultation, no bruit was heard. A provisional diagnosis of either a hematoma or an abscess was given and the patient was referred for further investigations.

An x-ray was taken of the soft tissue swelling to assess for any bony involvement. After ruling it out, an aspiration and evacuation of the swelling was sought. However, when the needle was positioned into the swelling, frank blood was aspirated, and the swelling refilled quickly. Hence, a compression bandage was applied over the site and the patient was evaluated further.

CT leg was taken which showed a soft tissue swelling noted in the deep posterior compartment involving the tibialis posterior muscle (Fig 1A & 1B).

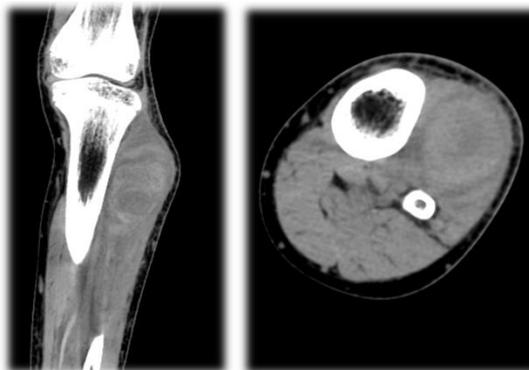


Fig-1: A and 1B showing soft tissue swelling

Patient was then referred for MRI leg which showed a large T2 hypointense flow void noted along the anterior aspect of the tibia and proximal leg. There

was also a large T1 hyperintense hematoma noted along the aneurysm in the anterior and posterior compartment muscles of the leg.

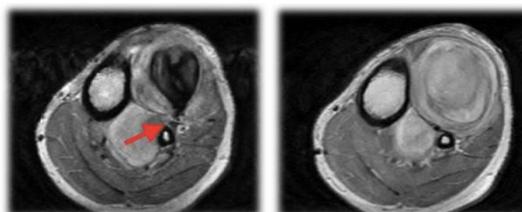


Fig-2A and 2B: MRI axial showing a large T2 hypointense flow void noted along the anterior aspect of the tibia and proximal leg with large T1 hyperintense hematoma noted along the surrounding aneurysm

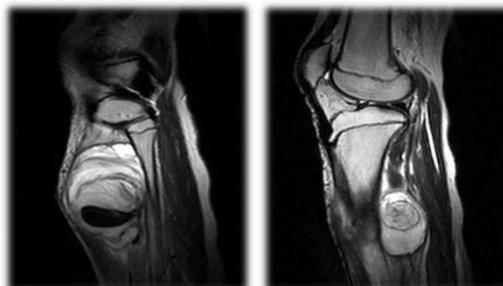


Fig-3A: coronal, and 3B: sagittal

Following this, the patient was wheeled in for surgery. Under surface anesthesia, the anterior tibial

artery was ligated, and the hematoma in the deep posterior compartment was evacuated.



Fig-4: Surgical steps involving in ligation of the left anterior tibial artery and evacuation of the hematoma in the deep posterior compartment involving the left tibialis anterior muscle.

During the post-operative period, the patient initially developed neuropraxia, which subsequently resolved in the following two days. Peripheral pulses were felt and were normal throughout the post-operative recovery period.

DISCUSSION

A pseudoaneurysm is basically a false aneurysm. It is caused due to a breach in the vascular wall, leading to an extravascular hematoma that is contained by the surrounding tissues, but freely communicates with the underlying intravascular space. As such, it is not a true aneurysm, and does not warrant any undue panic or emergency intervention, as one would expect.

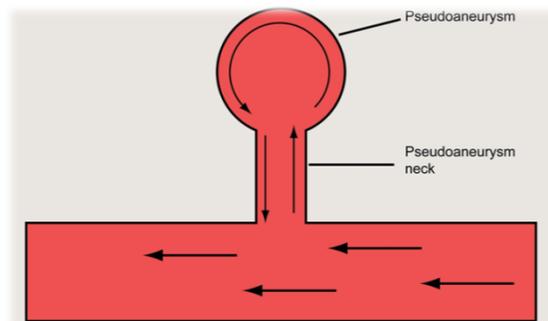


Fig-5: A schematic diagram illustrating the formation of a pseudoaneurysm.

The causes for the formation of a pseudoaneurysm includes trauma, including sports injuries, an iatrogenic etiology, or simply a dehiscence of the vascular anastomosis in the pertaining site[2]. They usually occur in the regions of the thorax, abdomen, head and neck, with the most common sites being the limbs. Sometimes a traumatic aneurysm can occur in the region of a closed injury too. One common area that occurs in the butchering trade, is the femoral artery in the groin[1]. Other causes of pseudoaneurysm include fractures, and surgeries, which include arthroscopy, high tibial osteotomy, open synovectomy, femoral inter-locking nailing, tibial nailing and total replacement of the knee[3-8]. Some rare instances of the condition occurring has been reported, such as after tibio-talar calcaneum fusion surgery, proximal tibial Steinmann Pin insertion and ankle arthroscopy[9-11].

Common symptoms reported by a typical patient include pain and tenderness in the affected area, and a swelling which may be pulsatile. In doubtful scenarios as in this case, an ultrasound, with or without Doppler, coupled with a CT, with or without an angiogram, and an MRI of the affected area will usually clinch the diagnosis in almost all cases.

Management of a pseudoaneurysm includes ultrasound probe compression, which is time-consuming yet effective in some cases. Injection of thrombin under ultrasound guidance is another option, although it is mainly used in cases involving the common femoral artery, and is found to be effective in those cases[12]. Other options include coil embolization and endovascular stenting[13]. Coil embolization has been employed in some instances with limited success. Endovascular stenting has been reported to be effective in lower extremity vessels[14]. Surgical intervention mainly involves ligation of the concerned vessel.

CONCLUSION

This case highlights the need to consider pseudo-aneurysms as a possible differential diagnosis apart from abscess and hematoma, considering the history of the patient, and that surgical intervention is still considered the management of choice for a complete recovery.

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