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PSEUDO-ANEURYSM OF THE ANTERIOR TIBIAL ARTERY WITH FOOT DROP FOLLOWING A SPORTS INJURY – AN UNUSUAL CASE REPORT

Surgery

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ABSTRACT

Pseudo-aneurysms are more common in the extremities when compared to true aneurysms, trauma being the commonest cause . Anterior tibial artery in the leg is not a common site for pseudo-aneurysm following sports injuries. Frequently these are misdiagnosed as musculoskeletal injuries, even when there is no definitive cause found. We highlight the steps for the diagnosis of these injuries, and methods for management of these injuries.

KEYWORDS

Anterior tibial artery; Hematoma; Pseudo-aneurysms; true aneurysms

INTRODUCTION:

Pseudo-aneurysms are more common in the extremities when compared to true aneurysms, trauma being the commonest cause [1,2] . Anterior tibial artery in the leg is not a common site for pseudo-aneurysm following sports injuries. Frequently these are misdiagnosed as musculoskeletal injuries, even when there is no definitive cause found. As these injuries are limb threatening, they should be diagnosed early so that proper treatment can be delivered. We highlight the steps for the diagnosis of these injuries, and methods for management of these injuries. It is important for doctors to be aware of the possibility of such injury in patients with apparently mild trauma from sports injuries, who have significant pain and swelling and are at higher risk of limb loss.

CASE REPORT:

A 24 year old male patient presented to us with pain and swelling in the anterior aspect of left leg since 2 weeks. Two weeks back he sustained injury to his left leg while playing cricket, allegedly hit by a bat. He was initially evaluated at a secondary center for fracture which turned out to be negative following which he was diagnosed to have hematoma and evacuation was done. Following evacuation the swelling recurred and gradually progressed to the current size. Swelling was associated with pain, present throughout the day, associated with difficulty in walking. Arterial Doppler showed pseudo-aneurysm arising from anterior tibial artery following which he was referred to us.

On examination the patient had a swelling on the anterolateral aspect of the leg measuring 15cm x 12cm (Fig1). Swelling was tender and pulsatile. Peripheral pulses were palpable. Patient had a high stepping gait. Cutaneous sensations were intact.

Fig1: Clinical picture of Pseudo-aneurysm

Owing to the large size of the aneurysm we decided to go for a CT angiogram for confirmation and to look for injury to the artery at any other site and for any A-V communications. CT angiogram confirmed the findings of a pseudo-aneurysm arising from the anterior tibial artery (fig.2).

Fig2: CT Angiography demonstrating Pseudo-aneurysm of ATA

Patient underwent open surgery. Proximal control of the superficial femoral artery (fig.3) and distal control of the anterior tibial artery were taken before opening up the aneurysm. Contents were evacuated (fig.4), followed by primary repair of the artery (fig.5). Post operative period was uneventful. Patient recovered well, gait improved. He was discharged on an ankle foot offloading (AFO) splint.

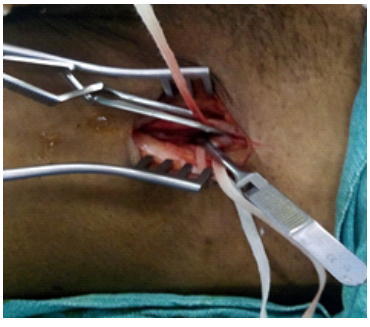

Fig3: Proximal control at common femoral artery

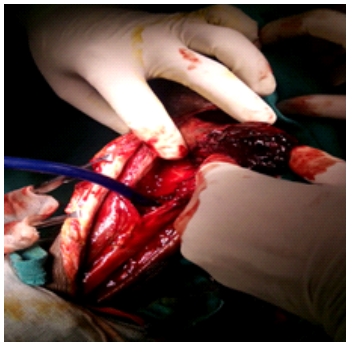

Fig4: Evacuation of contents of Pseudo-aneurysm

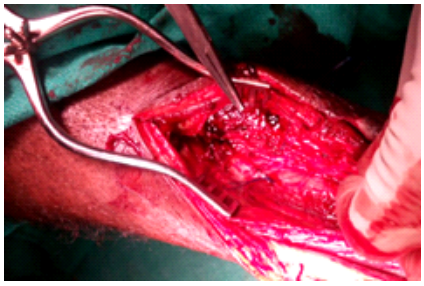

Fig5: Primary repair of anterior tibial artery

DISCUSSION:

A pseudo-aneurysm is a rim of fibrous tissue containing thrombus and arterial flow in continuity with a defect in the artery. There is a communication with the arterial lumen and blood extravasates into the surrounding tissue. It is a "pseudo" aneurysm where in no elements of the arterial wall are incorporated in the aneurysm sac, the wall of the pseudo-aneurysm consists solely of compressed thrombus and surrounding soft tissue. Pseudo-aneurysm can be differentiated from hematoma in that there is arterial flow into the pseudo-aneurysm with a defined neck that tracks to the traumatic site. Pseudo-aneurysms are characterized by a pulsatile mass at the site of trauma.

They are often associated with tenderness and can be difficult to differentiate from a hematoma. Large pseudo-aneurysms can cause local compression of the nerve, leading to a neuropathy or foot drop depending on the site, or of the vein leading to thrombosis. Large pseudo-aneurysms are associated with a pulsatile mass bruit which can be auscultated and can also cause local skin ischemia.

When a pseudo-aneurysm is suspected, duplex ultrasound examination should be performed. Duplex ultrasound examination helps in determination of the size and also allows differentiation between hematoma and pseudo-aneurysm, the latter having arterial flow characteristics outside the vessel. The typical ultrasound appearance of a pseudo-aneurysm is an echolucent sac that is pulsatile and with the addition of Colour Doppler study a swirling flow pattern is noted within the sac. On spectral waveform analysis, the characteristic "to-and-fro" flow pattern can be found which is pathognomonic for pseudo-aneurysm.8 Adjacent structures can also be visualized with B-mode imaging, and after the artery is localized, the neck of the aneurysm can be found as it communicates with the sac. The sensitivity of Duplex ultrasound for the identification of pseudo-aneurysm is 94% with a specificity of 97%.9If the pseudo-aneurysm has significant extension into the muscular planes the sensitivity and specificity of Duplex falls down. For large pseudo-aneurysm as seen in our case, contrast-enhanced CT is preferred to check its size as well as to find more arterial injury sites and necrosis.

The popliteal artery is the most common vessel injured following blunt trauma, next being by the superficial femoral artery and the anterior tibial artery4. The injury to the vessel occurs due traction against its immobile attachments to long bones[5].

Injuries to the anterior tibial artery are found after interventional procedures such as ankle arthroscopy, however they are very rare as a result of hyper-plantar flexion or inversion of the ankle3, with only a few cases reported in literature [5,6,7].
Anterior tibial artery is commonly injured at the ankle joint, with hyperplantar flexion or inversion being the common cause for injury during sports. In the leg the anterior tibial artery is protected between the tibia and muscles of the anterior compartment. Hence is not a common site for anterior tibial artery pseudo-aneurysm.

Foot drop is a gait abnormality characterised by high stepping gait or neuropathic gait. While walking, people suffering from this condition will bend their knees to lift their foot higher than usual to avoid the dragging[2]. This helps to raise the foot high enough to prevent the toe from dragging and hitting the ground[3][4]. To contain the toe drop, the patient may walk tiptoe on the opposite leg, raising the thigh higher than necessary, as if walking upstairs while letting the toe drop [11].Deep fibular nerve which is a branch of common fibular nerve is in close proximity of the anterior tibial artery throughout its course. Large pseudo-aneurysms have a tendency to compress the nerve resulting in foot drop which is usually temporary and resolves once the compression is relieved.

Conclusion:

Pseudo-aneurysm is not always the first diagnosis following trauma or sports injury as it is not very common. High level of clinical suspicion of vessel injury is vital in leading to the diagnosis, with the indication for further investigation when the patient presents with unexplained swelling or unexplained haemarthrosis. Injury to the blood vessels can be limb threatening and delay in diagnosis of these injuries can lead to complications that vary from severe pain, ulceration and limb loss. Hence high index of awareness about this condition is important to make the diagnosis.

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