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Case Report

Catheter-based therapy for traumatic pseudoaneurysm of the anterior tibial artery[☆]Ahmed E. Ali^a, Akram Haggag^b, Ammar Almekhmi^{c,*}^a Department of Medicine, University of Alabama at Birmingham, Birmingham, AL, USA^b Department of Medicine, Crestwood Medical Center, Huntsville, AL, USA^c Department of Radiology and Medicine, University of Alabama at Birmingham, Birmingham, AL, USA

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ABSTRACT

Tibial artery pseudoaneurysms often result from penetrating or blunt trauma to the lower extremities, or after orthopedic and endovascular interventions. Clinically, these lesions manifest as an expanding pulsatile mass of the affected area accompanied with pain and erythema. Despite the rare occurrence, traumatic tibial pseudoaneurysms can be associated with significant morbidity including local discomfort, rupture, and lower limb ischemia. Duplex ultrasound is considered the gold standard for diagnosis. Treatment options include surgical repair, ultrasound-guided compression or thrombin injection, and endovascular repair. In this report, we describe a 42-year-old male who presented to our center with pulsatile swelling over the mid-lateral aspect of the left leg. The diagnosis of a large anterior tibial artery pseudoaneurysm was made on clinical basis and was confirmed with computed tomography angiography. The lesion was treated endovascularly with a covered stent graft. In conclusion, this case highlights the role of endovascular therapy as a surgery-sparing and minimally invasive approach in managing traumatic peripheral arterial pseudoaneurysms with excellent clinical outcomes.

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Introduction

By definition, a pseudoaneurysm is a collection of blood that results from blood leakage into the perivascular space that remains connected to the artery through a defect in the arterial wall. Several mechanisms are involved in the formation of pseudoaneurysms including penetrating [1] and blunt

trauma [2], sports activities [3], and after orthopedic [4] and endovascular procedures [5]. While these lesions may remain asymptomatic, they often present with swelling, erythema, pain and progressively enlarging pulsatile mass [6]. On rare occasions, these pseudoaneurysms can be associated with arterial compression and subsequent limb ischemia [3]. Traumatic anterior tibial artery aneurysms are infrequently seen in clinical practice with only few cases that are reported in the

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literature [1,6,7]. Several management modalities have been employed to treat traumatic pseudoaneurysms including surgical ligation or direct repair [8], ultrasound-guided thrombin injection, [9] and ultrasound-guided compression [10]. Currently, the endovascular approach has become the cornerstone to manage these lesions with great outcomes [1,2]. Here we report a case of a 42-year-old male patient who presented with a progressive swelling and pulsatile mass over the left leg few months after sustaining machinery injury and was found to have a pseudoaneurysm arising from the anterior tibial artery. He was treated endovascularly by deploying a covered stent graft with complete resolution of the lesion.

Case report

A 42-year-old male with no significant past medical history presented to our hospital with a progressive pulsatile bulging over the left leg accompanied with pain and erythema of the affected area. Physical exam was remarkable for a 4 × 5 cm pulsatile mass at the antero-lateral aspect of the limb and a continuous bruit over the lesion upon auscultation (Fig. 1). On further questioning, the patient reported a traumatic injury at the lesion site related to a wound that he sustained while trimming a tree without any obvious arterial injury. The wound was treated with simple suturing without any complications. However, over the last 2-3 months, the patient noticed a pulsating bulge at the site of the injury that was associated with discomfort mainly during exertion. Blood work was within normal limits including blood count, complete metabolic panel, and coagulation studies. Computed tomography angiography of the leg reveals a 3.5 cm pseudoaneurysm originating from the anterior tibial artery. Subsequently, an arteriogram of the left lower extremity confirmed the location and anatomy of the lesion (Fig. 2). Subsequently, the pseudoaneurysm was excluded successfully with a covered stent graft



Fig. 1 – A pulsatile bulging was seen over the antero-lateral aspect of the left leg.

and the patient was discharged on dual antiplatelet agents (Fig. 3). During the follow-up, the patient had a complete resolution of the pseudoaneurysm with good patency of the anterior tibial artery.

Discussion

Pseudoaneurysms often develop following iatrogenic and surgical procedures; however, the incidence of traumatic anterior tibial artery aneurysms is quite rare with few described cases reported in the literature [1,6,7]. The main clinical manifestation of the traumatic pseudoaneurysms is pulsatile swelling over the affected artery. The pseudoaneurysms are suspected clinically based on the history of a previous injury and physical exam. The diagnosis is usually confirmed with imaging studies such as duplex ultrasonography and computed to-

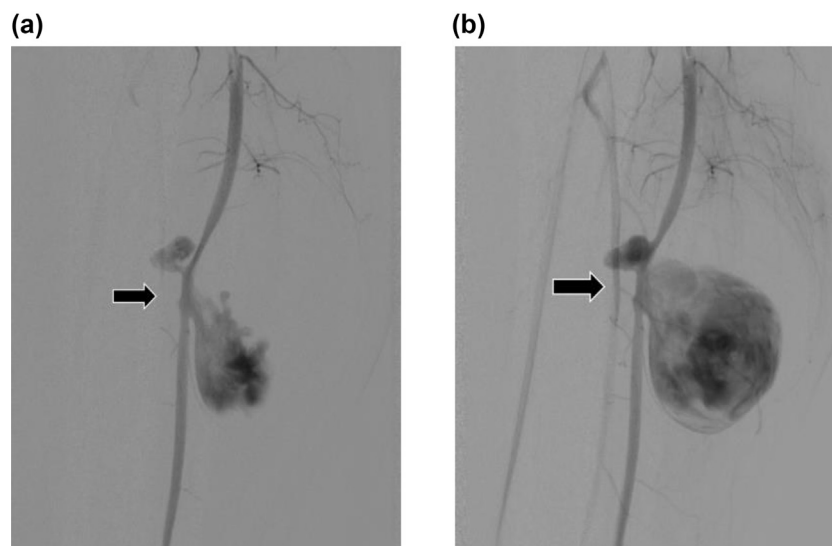


Fig. 2 – Selective arteriogram of the left lower extremity showing two pseudoaneurysms arising from the anterior tibial artery.

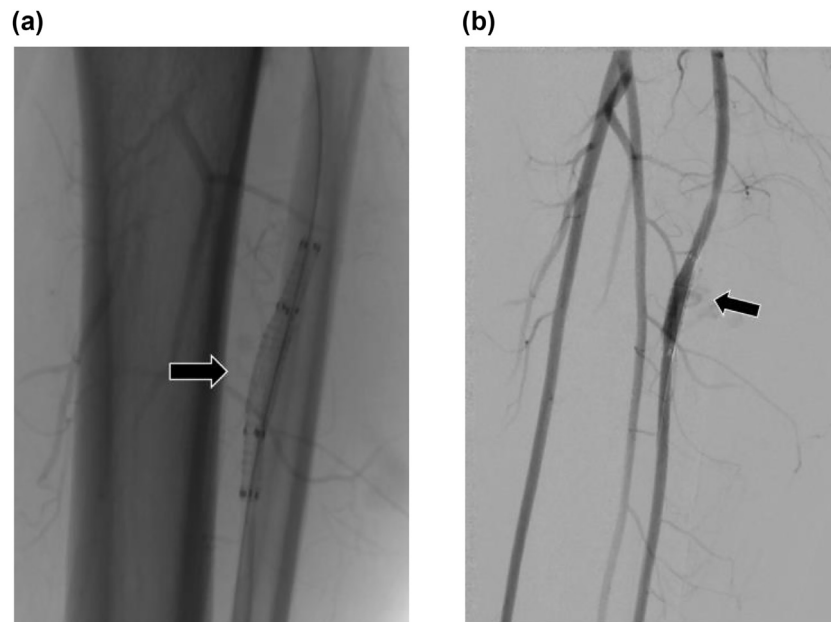


Fig. 3 – The pseudoaneurysms were treated using two covered stents with good angiographic results.

mography angiography [11]. Traditionally, surgical repair is considered the definitive treatment for managing the peripheral arterial pseudoaneurysms. However, this approach is associated with multiple risks including wound infection, hemorrhage, anesthetic complications, and long post-operative recovery course [11]. On the other hand, catheter-based therapy that utilizes stent grafts has emerged as a surgery-sparing and minimally invasive option for tibial artery pseudoaneurysms [12]. However, it is noteworthy that these endovascular approaches are associated with several drawbacks including potential thromboembolism risk and the necessity for antiplatelet therapy and intrastent stenosis [13]. Alternatively, other treatment strategies can be used such as observation and surveillance, ultrasound-guided compression, or thrombin injection based on the clinical scenarios. Ultrasound surveillance might be considered for smaller pseudoaneurysms less than 2 cm. Though, it carries a risk of pseudoaneurysm rupture and subsequent limb ischemia [11]. US-guided compression, while safer, demands prolonged time and exhibits lower success rates. Additionally, thrombin injection carries a risk of thrombin embolism and is contraindicated in thrombin-allergic patients [13].

Taken together, traumatic pseudoaneurysms of the anterior artery should be treated non-invasively using endovascular excluding stents. On the other hand, the surgical approach is reserved for complicated cases in which the neuro-vascular bundle is involved, and in those who failed non-invasive measures and endovascular therapy.

Patient consent

Written informed consent was obtained from the patient for all procedures and publication of this case and accompanying images.

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