

CASE REPORT

Traumatic Ulnar Artery Pseudoaneurysm Secondary to Self-Inflicted Sharp Force Injury: A Case Report

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ABSTRACT

Ulnar artery pseudoaneurysm is a rare vascular complication of penetrating forearm trauma. Owing to the deep anatomical location of the ulnar artery, such lesions are infrequently encountered and may present in a delayed manner following injury. We report the case of a 23-year-old male who developed a progressively enlarging pulsatile swelling over the distal left forearm following a self-inflicted sharp-force injury. Duplex ultrasonography and computed tomography angiography confirmed the diagnosis of distal ulnar artery pseudoaneurysm. Surgical exploration revealed a pseudoaneurysm sac with organized thrombus and a 2 mm defect in the ulnar artery wall, which was repaired primarily using 7-0 polypropylene sutures. The postoperative course was uneventful, with preservation of distal perfusion and satisfactory wound healing. This case highlights the importance of maintaining a high index of suspicion for vascular injury in patients presenting with delayed swelling following penetrating trauma to the forearm. Early diagnosis and timely surgical intervention are essential to prevent complications such as rupture, thrombosis, distal embolization, and ischemia.

KEYWORDS

- Ulnar Artery • Pseudoaneurysm • Penetrating Trauma • Sharp-Force Injury
- Forearm Vascular Injury • Surgical Repair

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INTRODUCTION

Pseudoaneurysm is a vascular abnormality that occurs when disruption of the arterial wall allows blood to extravasate into the surrounding tissues, forming a pulsatile hematoma that maintains communication with the parent vessel. Unlike a true aneurysm, the wall of a pseudoaneurysm does not contain all layers of the arterial wall and is instead composed of fibrous tissue and surrounding soft tissue structures.

Upper extremity pseudoaneurysms are relatively uncommon, and involvement of the ulnar artery is particularly rare because of its deep anatomical location and protection by adjacent musculotendinous structures. Most cases arise secondary to penetrating trauma, iatrogenic injury, fractures, or repetitive blunt trauma. Clinical presentation may be delayed and includes pulsatile swelling, pain, recurrent bleeding, or neurovascular compromise.

Self-inflicted sharp-force injuries to the forearm are a recognized form of penetrating trauma; however, delayed development of an ulnar artery pseudoaneurysm following such injury is infrequently described in the literature. Prompt recognition and management are crucial to avoid potentially serious complications including rupture, thrombosis, distal embolization, compression neuropathy, and compromise of hand perfusion. We present a rare case of traumatic ulnar artery pseudoaneurysm secondary to a self-inflicted sharp-force injury, successfully treated with surgical repair.

CASE PRESENTATION

A 23-year-old male presented with a progressively enlarging swelling over the medial aspect of the distal left forearm. There was an alleged history of self-inflicted injury to the left forearm with a sharp object (knife) 18 days prior to presentation. Immediately following the injury, the patient sought treatment at a local healthcare facility, where wound dressing was performed.

Two days after the injury, the dressing became soaked with blood and the wound edges gaped, necessitating primary wound closure. Approximately two days after wound closure, the patient noticed a swelling at the injury site, which gradually increased in size and was associated with recurrent soakage

of the dressing. There was no history of fever, distal limb discoloration, numbness, or weakness.

On physical examination, a 2×3 cm pulsatile swelling was present over the medial aspect of the distal left forearm, approximately 3 cm proximal to the wrist joint (Figure 1). The overlying skin was erythematous with sutures in situ. Distal perfusion was preserved, with a warm hand and palpable peripheral pulses. No sensory or motor deficits were detected in the affected limb.



Figure 1: Clinical image of the Patients wrist

Duplex ultrasonography demonstrated a vascular sac measuring 2.0 × 1.7 cm adjacent to the ulnar artery, suggestive of an ulnar artery pseudoaneurysm. Computed tomography angiography confirmed the presence of a pseudoaneurysm arising from the distal ulnar artery and provided detailed anatomical delineation for operative planning (Figure 2).

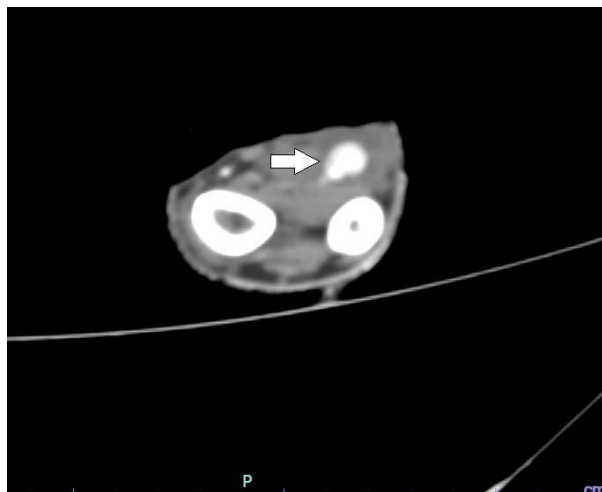


Figure 2: Computed tomography angiography Showing the presence of a pseudoaneurysm arising from the distal ulnar artery

In view of the symptomatic and progressively enlarging pseudoaneurysm, surgical repair was undertaken under supraclavicular brachial plexus block. Following proximal and distal vascular control of the ulnar artery, exploration of the lesion was performed. Intraoperatively, a pseudoaneurysm sac containing organized thrombus was identified. After evacuation of the thrombotic material, a rent measuring approximately 2 mm was visualized in the wall of the ulnar artery (Figure 3). The arterial defect was repaired primarily using 7-0 polypropylene (Prolene) sutures. Hemostasis was achieved, and restoration of distal arterial flow was confirmed before wound closure.



Figure 3: Intraoperative picture showing neck of the pseudoaneurysm

The post-operative period was uneventful. The patient maintained intact distal perfusion with no neurological deficits, and the surgical wound healed satisfactorily on follow-up.

DISCUSSION

Pseudoaneurysm of the ulnar artery is an uncommon vascular lesion that typically occurs following penetrating trauma, iatrogenic procedures, or repetitive blunt injury such as hypothenar hammer syndrome. Due to the relatively protected anatomical position of the ulnar artery beneath the flexor carpi ulnaris muscle, traumatic pseudoaneurysms involving this vessel are rare.¹

The pathophysiology of pseudoaneurysm formation involves disruption of the arterial wall with persistent communication between the arterial lumen and surrounding hematoma cavity. Over time, the hematoma becomes encapsulated by fibrous tissue, resulting in a pulsatile mass. Delayed presentation is common and may lead to diagnostic challenges, particularly when initial wound management focuses primarily on superficial soft tissue injury.

Clinically, patients may present with pulsatile swelling, pain, recurrent bleeding, bruit, distal ischemia, or compressive neuropathy. In the present case, the patient developed recurrent soakage of the wound dressing followed by gradual enlargement of a pulsatile swelling, which raised suspicion of an underlying vascular injury. Preservation of distal pulses does not exclude arterial injury because collateral circulation in the hand is often adequate.

Duplex ultrasonography is a valuable initial diagnostic modality because it is noninvasive, cost-effective, and capable of demonstrating turbulent flow within the pseudoaneurysm sac, including the characteristic “yin-yang” sign. Computed tomography angiography further delineates vascular anatomy, identifies the site of arterial injury, and assists in operative planning.²

Management strategies depend on the size, location, symptoms, and vascular status of the affected limb. Small asymptomatic pseudoaneurysms may occasionally thrombose spontaneously; however, enlarging or symptomatic lesions generally require intervention. Available treatment options

include ultrasound-guided thrombin injection, endovascular techniques, arterial ligation, and open surgical repair.³ In distal upper extremity pseudoaneurysms, surgical exploration remains the preferred treatment in many cases because it allows direct visualization of the lesion, evacuation of thrombus, and definitive arterial reconstruction while preserving distal circulation.

In our patient, primary repair of the arterial defect was feasible because of the small size of the rent and healthy arterial margins. Early surgical intervention resulted in excellent functional and vascular outcomes without complications.⁴

This case emphasizes the need for a high index of suspicion for pseudoaneurysm in patients presenting with delayed swelling or recurrent bleeding after penetrating forearm trauma.⁵ Careful vascular examination and timely imaging are essential for accurate diagnosis and prevention of complications.

CONCLUSION

Traumatic ulnar artery pseudoaneurysm is a rare but important complication of penetrating forearm injury. Delayed presentation may occur despite apparently adequate initial wound management. Progressive pulsatile swelling and recurrent bleeding following

forearm trauma should prompt evaluation for vascular injury. Duplex ultrasonography and computed tomography angiography are valuable diagnostic tools. Early surgical repair provides definitive treatment and helps preserve distal limb perfusion while preventing potentially serious complications.

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