CASE REPORT

Radial artery aneurysm in the anatomical snuff box: a rare case with uncertain aetiology

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Introduction

Arterial aneurysms in the upper limb are rare, and among them, radial artery aneurysms are particularly uncommon, representing only 2.9% of all upper limb arterial aneurysms [1,2,3]. Most radial artery aneurysms are pseudoaneurysms caused by medical interventions like angiographic procedures, arterial pressure monitoring, or drug injection [4]. A pseudoaneurysm is an arterial dilation that does not involve all layers of the arterial wall, whereas a true aneurysm includes the complete thickness of the arterial wall, and typically result from factors such as repeated blunt trauma, atherosclerosis, vasculopathies, metabolic or congenital diseases, or connective tissue disorders [4]. These aneurysms are characterized by a localized dilation that exceeds 1.5 times the normal radial arterial diameter, which is usually between 2 to 3 mm [2,4].

The diagnosis can be confirmed using imaging techniques such as Duplex ultrasound, CT angiography, and MR angiography. Treatment options include surgical excision, ligation, primary vessel repair, or with an interposition graft [2,5]. Complications of radial artery aneurysm include distal thromboembolism, distal ischaemia, rupture, haemarthrosis, adjacent nerve irritation, paresthesia, limited wrist mobility, skin ulceration, and secondary infection [3].

Case presentation

A 65-year-old male with a history of hypertension, ischaemic heart disease and cerebrovascular disease presented with a gradually enlarging, painful pulsatile mass in the dorsolateral aspect of the left wrist over a period of four years. He had no prior history of trauma, intravenous drug abuse or radial artery cannulation. On examination, there was a pulsatile lesion in the left anatomical snuff box without any overlying scar with intact neurovascular status.

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An ultrasound scan showed a well-defined mass measuring 3.2 × 1.2 × 2.7 cm with arterial blood flow, suggesting a left radial artery aneurysm with mural thrombus. Both the radial and ulnar artery pulses were palpable, and Allen's test revealed complete palmar arch. It was decided to excise the aneurysm.

The left anatomical snuff box was surgically explored under local anaesthesia, and a true radial artery aneurysm was excised (Figure 1). After mobilization of the aneurysm and proximal and distal radial arteries, there was adequate length of arteries for the end to end anastomosis. Reconstruction was performed using 7-0 polypropylene. Digital flow was confirmed after the reconstruction with triphasic hand-held doppler signals. At present, the patient is recovering well. Histopathological report confirmed the clinical diagnosis of thrombosed true aneurysm (Figure 2).

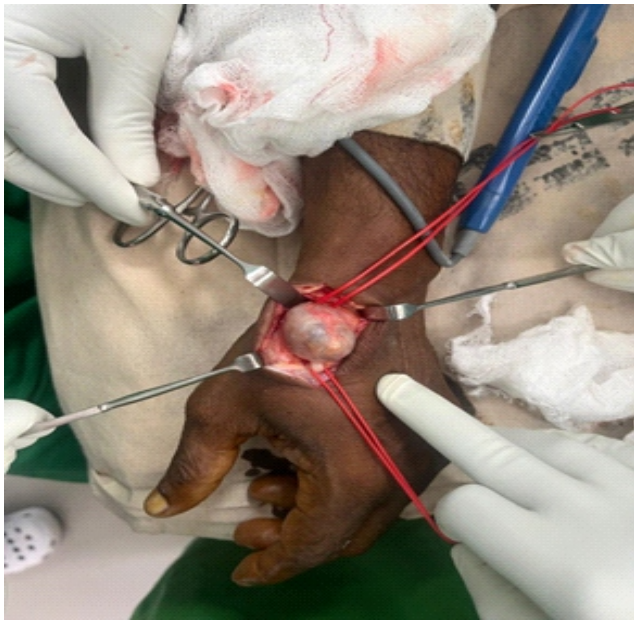

Figure 1: Intra-operative picture demonstrating the aneurysm

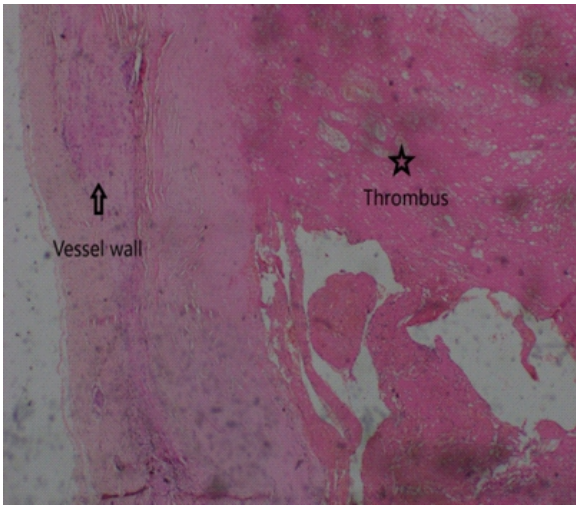

Figure 2: Histology of the excised lump

Discussion

In this case, no underlying cause could be identified from the patient's medical history, supporting the diagnosis of an idiopathic aneurysm. Initially, multiple differential diagnoses were considered due to the rarity of the condition. Ultimately, a duplex Ultrasound - an accessible and reliable diagnostic tool-was performed, confirming the aneurysm. Upper extremity arterial aneurysms are rare and radial artery aneurysm is the rarest given its small luminal size that requires a high pressure to enlarge [1]. The distal radial artery is the most frequent location for aneurysms, with the anatomical snuffbox being a commonly involved site [1], as observed in our case. Given its painful nature, location in the anatomical snuff box, and the presence of a thrombus that could potentially occlude or embolize, leading to distal ischemia, early surgical intervention was considered necessary.

Prior to the surgery, adequacy of distal circulation and the dominant arterial supply should be discovered. Allen's test, modified Allen's test, digital plethysmography, digital doppler waveforms and pressures, and duplex ultrasonography are some options that could be used [2]. We did Allen's test as it is simple and clinically confirmed complete arch which aided us in proceeding with the surgery.

There were multiple surgical approaches available but excision and end to end anastomosis was chosen as the aneurysm is located in a major artery which is critical for blood supply to the thumb where the ligation might cause digital ischaemia. In addition, excision will remove the pathology and prevent the establishment of complications in the future. Interposition graft was not needed as the aneurysm is not lengthy and adequate artery length was achieved with mobilization. So, we were able to do reconstruction as the arteries were with good diameter and length for the end to end reconstruction.

Histology report confirmed the thrombosed true radial artery aneurysm with the evidence of recanalization excluding the possibilities of pseudoaneurysm, mycotic aneurysm, arteriovenous malformation and vascular tumors which depict the properly managed case with timely intervention that prevented the establishment of complications.

Conclusion

True radial artery aneurysms are rare, particularly in the absence of trauma or invasive procedures. This case highlights the importance of considering vascular lesions in the differential diagnosis of wrist masses, especially when pulsatile. Duplex ultrasound proved to be a valuable diagnostic tool, confirming the presence of an aneurysm and its complications. Early surgical intervention was warranted due to the aneurysm's painful nature, potential for thromboembolic complications, and impact on the patient's quality of life. Timely diagnosis and appropriate surgical management resulted in a favorable outcome, with the good postoperative recovery of the patient.

References

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Learning Points:

- Presence of a pulsatile mass should raise suspicion of an arterial aneurysm.
- Duplex ultrasound is an effective and valuable method for the diagnosis of radial artery aneurysms
- Prompt medical intervention is essential to avoid potential complications.