



Case report

Snuff box radial artery aneurysm: A case report and literature review

Ali Jawas^{a,*}, Hagir Mohamed^b, Mariam Almheiri^b, Sulaiman Alshamsi^b^a Department of Surgery, College of Medicine, UAE University, United Arab Emirates^b Department of Vascular Surgery, Tawam Hospital, United Arab Emirates

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ABSTRACT

Introduction and importance: Distal radial artery aneurysms in the anatomical snuff box are rare.**Case presentation:** Herein, we present the case of a snuff box radial artery aneurysm in a female patient with a possible history of trauma and discuss the evaluation and management of snuff box radial artery aneurysms. The aneurysm in this case was resected without reconstruction because of a normal preoperative Allen test finding and intraoperative evidence of adequate hand perfusion after the aneurysm was excised. The patient subsequently recovered with proper hand function.**Clinical discussion:** Radial artery aneurysms cases are rare; literature search by us and others have identified only 20 cases. For the detection and management of aneurysm, several high-end techniques may be employed; however, in this case, we employed non-invasive ultrasound method. The method is non-invasive and accurately delineates and localises an aneurysm, differentiates true arterial aneurysms from pseudoaneurysms, and identifies the presence of a mural thrombus. Further, the ultrasound assessments also help surgeons on requirement of radial artery reconstruction.**Conclusion:** In this case report, an anatomical snuff box radial artery aneurysm was surgically excised without reconstruction. Physical examination and Doppler ultrasound findings were employed to assess the medical condition of the patient; patient's proper hand function was restored.

1. Introduction

Radial artery aneurysms are rare and often secondary to penetration or iatrogenic trauma at the wrist level [1,2]. Snuff box radial artery aneurysms are even more uncommon, with a total of 20 reported cases to date. The anatomical snuff box is a triangular depression between the extensor pollicis longus and extensor pollicis brevis tendons where the radial artery lies relatively superficial and unprotected. In this case report, we present the diagnosis, evaluation, and management of a patient with an exceedingly rare case of a distal radial artery aneurysm in the anatomical snuff box.

Written informed consent was obtained from the patient for the publication of this case report and the accompanying images. This case report is in compliant with SCARE 2020 guidelines, and work is reported in line with the SCARE criteria [3].

2. Presentation of case

2.1. Presentation and examination

A 47-year-old woman presented with right wrist pain for 2 weeks. The patient had a history of right wrist swelling for the previous 2 years, with a gradual increase in the size of the swelling. There were no signs or symptoms suggestive of a thromboembolic event, and the patient had no underlying medical conditions, except for recently diagnosed hypertension. The patient was a non-smoker and had no clear previous trauma or aneurysmal disease; however, there was a history of heavy exercising, including kickboxing, during the previous year. A physical examination revealed a pulsatile non-tender mass that was approximately 1.5 × 1.4 cm in size in the right wrist snuff box area. There was no thrill or bruit over the mass. The radial and ulnar arteries were palpable at the wrist, there were no signs of finger ischaemia, and an Allen test returned a normal result. A general physical examination provided no obvious evidence of aneurysms in other areas of the body. Laboratory and clinical examinations did not indicate systemic inflammation, metabolic

* Corresponding author at: Department of Surgery, College of Medicine, UAE University, P O Box 17666, Al-Ain, United Arab Emirates.

E-mail address: amjawas@yahoo.com (A. Jawas).<https://doi.org/10.1016/j.ijscr.2022.107213>

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disorders, or autoimmune disease. A duplex ultrasound examination of the right upper extremity revealed a high bifurcation of the brachial artery in the upper arm. Both the right radial and ulnar arteries were patent at the wrist, with triphasic waveforms with peak systolic velocities of 77 and 73 cm/s, respectively. Furthermore, the palmar arch was patent. There was evidence in the snuff box area of radial artery aneurysmal dilatation (1.69×1.02 cm) that was partially thrombosed, with arterialised flow detected in the remaining area (Fig. 1), suggesting a true aneurysm.

2.2. Intervention

The patient underwent an open repair. Under local anaesthesia, a longitudinal skin incision was made over the aneurysm, which was subsequently dissected out; the superficial branch of the radial nerve was identified and protected, proximal and distal control of the radial artery was achieved (Fig. 2). The radial artery was clamped intra-operatively, followed by an examination of hand vascularity. Capillary perfusion was observed in the fingers, and the hand was pink and warm, with satisfactory Doppler signals obtained for the digital arteries. The aneurysm sac was excised through proximal and distal ligation of the radial artery, and the postoperative period was uneventful.

2.3. Outcome

The patient did not develop any hand ischaemia or neurological deficits and was discharged the same day. A pathological examination revealed a true radial artery aneurysm showing all three layers of the arterial wall. The patient reported no complaints and proper right-hand function and perfusion at 1 week and 6 months after the procedure.

3. Discussion

Upper-extremity arterial aneurysms are rare [1]. The most common location for these aneurysms is the distal ulnar artery, where they have been reported in conjunction with hypothenar hammer syndrome [4,5]. Radial artery aneurysms account for only 2.9% of all upper-extremity aneurysms [1,2]. Most of the previously reported radial artery aneurysms were pseudoaneurysms in the wrist that were associated with trauma related to arterial cannulation or cardiac interventional procedures. However, idiopathic true aneurysms of the radial artery are extremely rare [6–9]. The first case of a non-traumatic radial artery aneurysm was reported by Thorrens et al. in 1966 [10]. A total of 20 cases of Snuff box radial artery aneurysms have been reported to date. Yamamoto et al. performed a literature search in 2016 and found 16 cases of radial artery aneurysms in the anatomical snuff box [11]. We also found four other cases that were reported between January 2016 and January 2022 [12–15]. Notably, prior to the present case, the English medical literature only contained reports of three other patients younger than 50 years of age who had a snuffbox radial artery aneurysm.

The etiology of the radial artery aneurysm in the present case was not known. The possibility of a connective tissue disorder or inflammatory condition was excluded based on normal inflammatory marker values and a histologic picture of the aneurysm. Although the patient did not report any trauma, there is a possibility that sustained blunt trauma to the hand during kickboxing went unnoticed. Halbach et al. suggested that compression imposed by the extensor pollicis longus tendon on the radial artery can be a contributing factor to the formation of an idiopathic aneurysm [12]. Behar et al. described a case of a true radial artery aneurysm in a tailor secondary to repetitive occupational injury [16]. Other reported cases of aneurysms describe trauma, infection, connective tissue disease, or atherosclerosis as the etiologic factors [11,17,18].

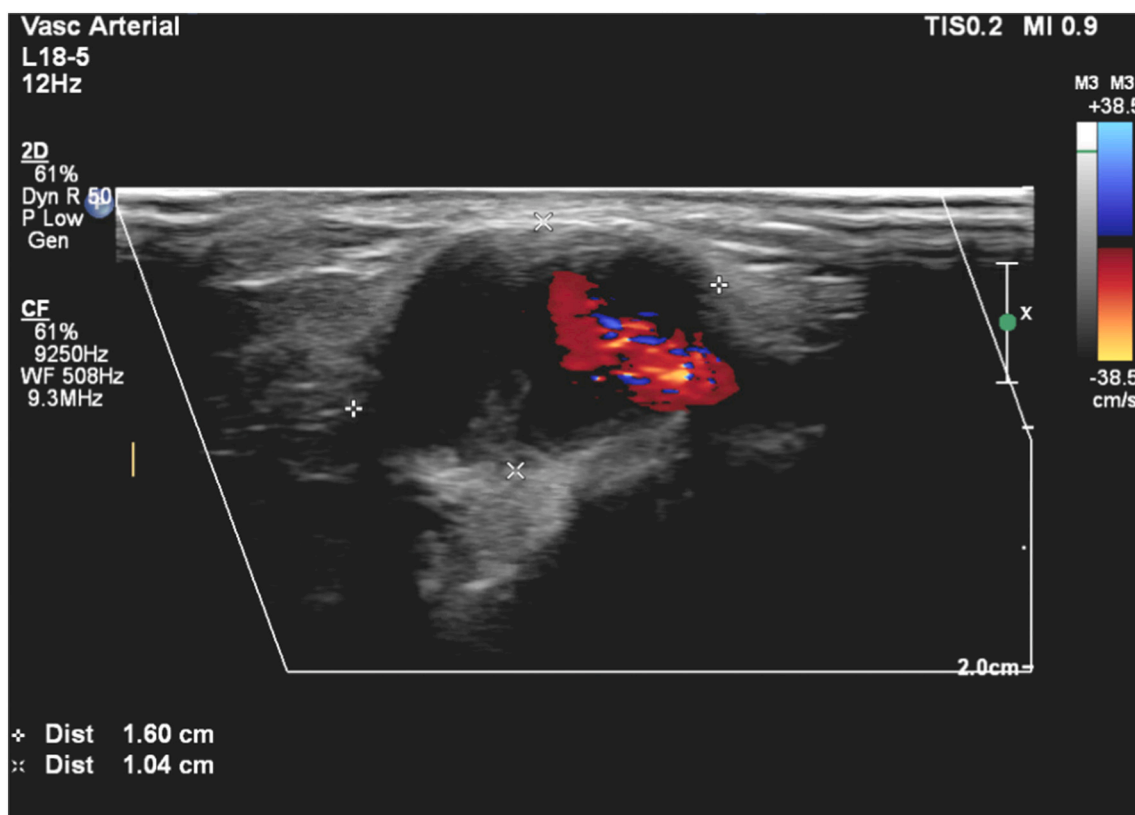


Fig. 1. Ultrasound scan of snuff box radial artery aneurysm.



Fig. 2. Operative exposure of the snuff box radial artery aneurysm.

Radial artery aneurysms can be diagnosed through detection of a pulsatile mass, although they can be misdiagnosed as a ganglion or soft-tissue tumour. Patients may present with an asymptomatic mass, hand pain [11], or pallor and paraesthesia related to a thromboembolism [13]. Duplex ultrasonography, computed tomography, magnetic resonance angiography, and conventional angiography are useful for making a definitive diagnosis of an aneurysm and for preoperative planning. Al Omran et al. emphasised the importance of Doppler ultrasound scanning in the evaluation and management of this disease [5]. Ultrasound allows for the non-invasive and accurate delineation and localisation of an aneurysm, differentiation of true arterial aneurysms from pseudoaneurysms, and identification of the presence of a mural thrombus; ultrasound assessments also provide perioperative information regarding the adequacy of hand perfusion, thereby helping surgeons decide whether radial artery reconstruction is required [5]. Although the Allen test and its several modifications are often performed to evaluate the adequacy of a patient's collateral hand circulation, angiography is occasionally recommended to obtain a clear diagnosis.

Thromboembolic complications accompanied by subsequent finger

and hand ischaemia can develop without the presence of any warning signs [13,19,20]. The surgical options for radial artery aneurysms depend on the presence of adequate hand perfusion after the aneurysm is excised. Simple resection is the recommended surgical option if the hand is adequately perfused; however, if the hand perfusion is inadequate, radial artery reconstruction is mandatory [20,21]. Reconstruction can be achieved using primary end-to-end anastomosis if there is no tension or an interposition vein graft if the defect is large.

In the present case, the radial artery aneurysm was resected without reconstruction. The decision to not perform a reconstruction after the aneurysm was excised was based on a normal preoperative Allen test and adequate hand perfusion, as demonstrated using the Doppler method.

4. Conclusion

This report presents a case of an anatomical snuff box radial artery aneurysm that was surgically excised without reconstruction. The patient was managed based on the results of physical examination and

Doppler ultrasound findings—more invasive or expensive studies were avoided—and proper hand function was restored.

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Ethical approval

This case report is exempted from ethical approval at our institution.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Research registration (for case reports detailing a new surgical technique or new equipment/technology)

None applicable.

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Mohammed H. and Almheiri M. Data Collection, writing the manuscript, approval of the manuscript.

Declaration of competing interest

All authors has no conflict of interest.

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