SAS Journal of Medicine
Abbreviated Key Title: SAS J Med
ISSN 2454-5112
Journal homepage: https://saspublishers.com

OPEN ACCESS

Emergency Radiology

Post-Traumatic Pseudo Aneurysm of the Radial Artery

OSSOUKA Nadiha[1*], Iboutsy L[1], Samouh F. Z[1], H. Tabakh[1], O. Kacimi[1], A. Siwane[1], N. Touil[1], N. Chikaoui[1]

[1]Emergency Radiology Department, CHU Ibn Roch, Casablanca, Morocco

DOI: 10.36347/sasjm.2021.v07i12.014 | **Received:** 22.11.2021 | **Accepted:** 25.12.2021 | **Published:** 30.12.2021

***Corresponding author:** OSSOUKA Nadiha

Abstract **Case Report**

In Morocco, each year, the emergency services and the University Hospital record more than 20% of the cases of hand injuries and trauma. The Ibn Rochd University Hospital in Casablanca alone records 5,000 cases annually, which represents 25% of all cases. This frequency means that many orthopedic surgery departments are called upon to treat these wounds on an emergency basis. It is usual to focus on a nerve or tendon injury as a priority. However, even partial vascular injuries can be complicated by a false aneurysm. This is a fairly rare condition, almost always unrecognized, with sometimes serious consequences, as it is complicated by thrombosis or embolism distal to the arteries of the palmar arch. The diagnosis is evoked by the existence of a sensitive mass, associated with dysesthesia of the fingers and a unilateral Raynaud's phenomenon. It is confirmed by an echo-Doppler. An arteriography is necessary to properly evaluate the palmar arches. It could be replaced by an angio-MRI. We report a case of a 47-year-old patient who came to us with a progressively evolving swelling following a penetrating hand trauma that occurred 12 months earlier. Doppler ultrasound completed by angioscan confirmed the diagnosis of pseudoaneurysm of the right radial artery. The diagnosis of pseudoaneurysm is easier with the considerable development of cross-sectional imaging and angiography.

Keywords: Radial artery, pseudoaneurysm, posttraumatic.

INTRODUCTION

Aneurysms of the upper extremity are rare and account for only 1% of all locations. Involvement of the radial or ulnar artery is even more rare [1]. These traumas may be complicated by a false aneurysm resulting from a partial wound of the arterial wall. This is the main cause of false aneurysms, where an organized hematoma is formed in communication with the artery and its wall has no histological features of a normal artery [2, 3].

OBSERVATION

A 47-year-old male patient came to the clinic with a subcutaneous swelling on the anterior aspect of the right wrist. On clinical examination, it was a pulsatile mass with a soft consistency, centimetric cystic appearance, painful on palpation without inflammatory signs. The radial pulse was present and the rest of the clinical examination did not reveal any signs of digital ischemia in the left hand. The history revealed a notion of penetrating trauma with a knife that had occurred 12 months earlier with uncomplicated consequences, and then the progressive evolution of the mass described above. The paraclinical workup included an ultrasound with Doppler study completed by an angioscanner of the right upper limb. Ultrasound showed the presence of a rounded formation communicating with the radial artery at the distal portion, a site of turbulence, producing a Ying-Yang aspect on color Doppler, with thickening of its wall testifying to its partial thrombosis, the downstream flow at the level of the radial artery is damped of the low resistance type, testifying to a vascular flight phenomenon (Figure 1& 2). Angioscanner allowed a more detailed study, showing a rounded mass measuring 6cm in diameter appended to the wall of the right radial artery (Figure 3), enhancing after injection of contrast medium in a homogeneous manner at arterial time (turbulence) (Figure 4). There was also a parietal thrombus measuring 16 mm in maximum thickness (Figure 4). The pseudoaneurysm describes a neck measuring 6 mm in caliber.

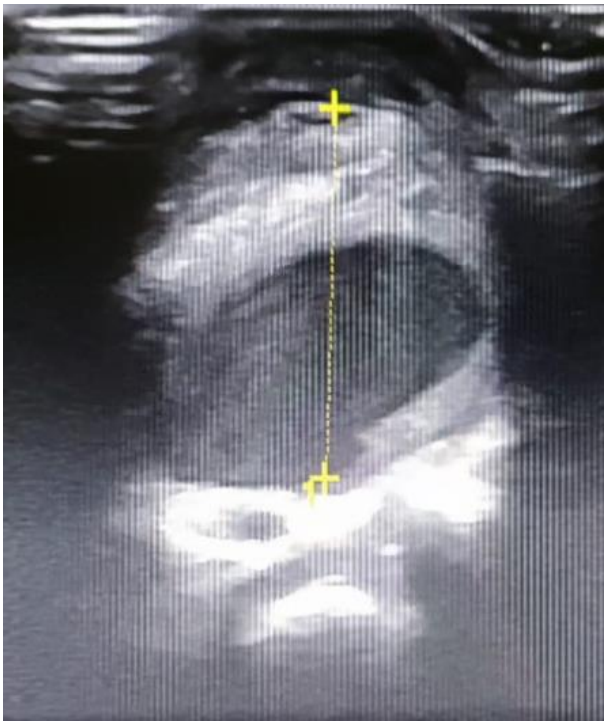

Figure 1: Ultrasound of the mass: rounded formation, seat of turbulence, with thickening of its wall testifying to its partial thrombosis

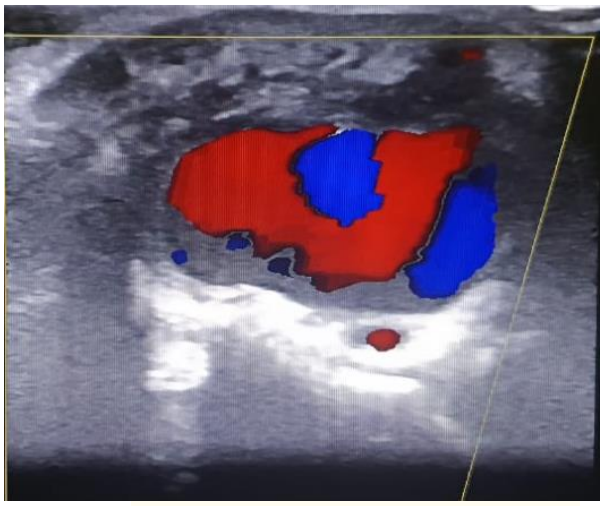

Figure 2: Color Doppler turbulence with a Ying-Yang appearance

Figure 3: Angioscan of the right upper limb: RV reconstruction showing pseudoaneurysm of the radial artery

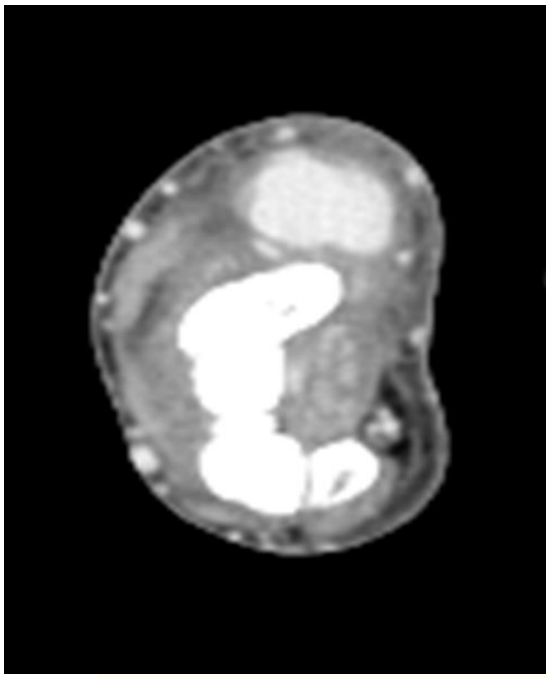

Figure 4: Angioscan of the right upper limb: MIP axial section showing homogeneous enhancement of the pseudoaneurysm at arterial time with parietal thrombus

DISCUSSION

Aneurysms involving the distal arteries of the upper limbs are rare and are most often secondary to penetrating trauma, or iatrogenic or inflammatory injury [4]; it is defined by a focal rupture of an arterial wall with maintained communication with its feeding artery.

Pseudoaneurysms are often asymptomatic and of incidental discovery [5]. Their evolution is marked by complications such as thrombosis and distal emboli, which is why the clinical presentation is often vascular in appearance, but also by nerve complications due to compression of the radial nerve rami [6]. Traumatic rupture of the aneurysm is possible but rare [7].

There are several imaging modalities for the exploration of pseudoaneurysms; Ultrasound allows to assess the shape of the aneurysm sac, its size, its location and the presence of a wall thrombus. Doppler ultrasound frequently shows a Ying-Yang sign, which describes a swirling blood flow pattern in the sac. In addition, it provides a significant amount of morphological and hemodynamic information about the entire arterial tree and information about the surrounding anatomical structures [8].

The CT angiography provides very reliable information on the anatomical environment, morphology and size of the aneurysm, its boundaries, wall structure and contents. It is an excellent method of imaging the anatomical environment of the lesion, allowing the surgeon to adapt his surgical tactics [8].

On a CT scan without contrast injection, the pseudoaneurysm may be seen as a round hypodense formation abutting the artery of interest associated with infiltration of adjacent structures of intermediate or high density depending on chronicity. A similar appearance will be seen on examination with contrast injection (PDC); the pseudo aneurysmal sac partially or completely filled by PDC, depending on the possible presence of thrombosis [7].

Magnetic resonance angiography (MRA) is an interesting alternative examination, especially in cases of advanced renal failure or allergy to the contrast medium [9].

For most teams, conventional arteriography remains an indispensable examination, important for the diagnosis of the lesion, to accurately obtain its limits and to give the "road map" of the necessary arterial reconstruction. To achieve this goal, arteriography must provide good quality 3-dimensional images of the overlying arteries, all major collaterals arising from the aneurysm and the downstream bed [8].

However, it remains an invasive and radiating examination for the patient and the physician, which is why this examination is currently not performed for the positive diagnosis of pseudoaneurysm, but for therapeutic planning, or even only performed during endo-vascular treatment [10].

Treatment of pseudoaneurysms can be performed by several methods; it includes simple monitoring in the presence of the possibility of spontaneous thrombosis for small pseudoaneurysms, pharmacological thrombosis with ultrasound-guided compression, stenting and embolization, surgery (using bypass or ligation) in the presence of a mass that is painful or interferes with professional or sports activity, or in the presence of neurological signs. Simple resection without revascularization is quite feasible, especially in case of thrombosed aneurysm [11]. In 2004, Komorowska-Timek et al reported the successful use of thrombin injection to induce ultrasound-guided thrombosis in the treatment of a 3 cm false aneurysm of the radial artery and another 2.5 cm false aneurysm of the ulnar artery resulting from arterial trauma during failed catheterization [12].

However, the treatment protocol is not universal, and management takes into account the particularity of each clinical presentation.

CONCLUSION

The diagnosis of radial artery pseudoaneurysm, despite its rarity, must be evoked in the presence of evocative clinical signs, generally occurring in a penetrating traumatic context. Its positive diagnosis has become easier with the advent of the new technologies of cross-sectional imaging and angiography, allowing an earlier and more concise diagnosis. In order to ensure urgent management and avoid fatal complications for the patient. Surgical revascularization remains the preferred treatment.

Conflicts of Interest: The authors declare no conflicts of interest.

Contributions of the authors

All authors contributed to the conduct of this work. They have read and approved the final version of the manuscript

REFERENCES

1. Ho, P. K., Weiland, A. J., McClinton, M. A., & Wilgis, E. S. (1987). Aneurysms of the upper extremity. *The Journal of hand surgery*, *12*(1), 39-46.
2. Mas, R. G., & Hostench, F. A. (1992, January). Faux anévrysme de la arteria digitalis communis. In *Annales de chirurgie de la main et du membre supérieur* (Vol. 11, No. 2, pp. 166-169). Elsevier Masson.
3. Michel, P., Jarry, J., & Pagliano, G. (2012). Faux anévrisme iatrogène de l'artère splénique après duodénopancréatectomie céphalique. *Journal des maladies vasculaires*, *37*(1), 22-25.

4. Luzzani, L., Bellosta, R., Carugati, C., Talarico, M., & Sarcina, A. (2006). Aneurysm of the radial artery in the anatomical snuff box. *EJVES Extra*, *11*(5), 94-96.
5. Zbair, S., Dinari, J., Siwane, A., Lezar, S., & Essodegui, F. (2017). Pseudo-anévrisme post traumatique de la carotide externe. *The Pan African Medical Journal*, *28*, 272.
6. Temam, M., Abadie, O., Chetboun, A., & Mamane, W. (2015). Faux anévrysme de l'artère radiale à la main. *Journal des Maladies Vasculaires*, *40*(1), 53-57.
7. Busquéts, A. R., Acosta, J. A., Colón, E., Alejandro, K. V., & Rodríguez, P. (2004). Helical computed tomographic angiography for the diagnosis of traumatic arterial injuries of the extremities. *Journal of Trauma and Acute Care Surgery*, *56*(3), 625-628.
8. Koskas, F., & Kierffer, E. (1998). Anévrismes artériels des members. Encycl Méd chir. ENC. AKOS Encyclopédie pratique de médecine (Elsevier, Paris), 2-0460: 8p.
9. Laurian, C., Paraskevas, N., & Elleuch, N. (2004). Anévrismes artériels des membres inférieurs. *EMC-Cardiologie-Angéiologie*, *1*(3), 271-280.
10. Baum, R., & Carpenter, J. P. (1997). Peripheral vascular magnetic resonance angiography. In: Baum R, editor. Abram's angiography. 4th ed. Boston, Mass: Little, Brown; pp. 752–763. In press.
11. Galati, G., Cosenza, U. M., Sammartino, F., Benvenuto, E., & Caporale, A. (2003). True aneurysm of the ulnar artery in a soccer goalkeeper: a case report and surgical considerations. *The American journal of sports medicine*, *31*(3), 457-458.
12. Komorowska-Timek, E., Teruya, T. H., Abou-Zamzam Jr, A. M., Papa, D., & Ballard, J. L. (2004). Treatment of radial and ulnar artery pseudoaneurysms using percutaneous thrombin injection. *The Journal of hand surgery*, *29*(5), 936-942.