

An Unusual Volar Wrist Mass: Radial Artery Pseudoaneurysm Following Transradial Catheterization

CME
Credits

Mathieu Boudier-Revéret¹, Meng-Ting Lin², Tyng-Guey Wang^{2*}

¹Department of Physical Medicine and Rehabilitation, University of Montreal Health Center, Montreal, Canada,

²Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital, College of Medicine, National Taiwan University, Taipei, Taiwan

Abstract

Arterial pseudoaneurysms can develop secondary to a vessel injury, for example, an arterial line installation. We present a case of an 18-year-old female with mitochondrial encephalopathy, lactic acidosis, and stroke-like episodes syndrome who developed left radial artery and right brachial artery pseudoaneurysms secondary to arterial line placement and repeated blood draws, respectively. The ultrasonographic features of pulsating mass in connection with an artery and the yin-yang sign, combined with the patient's history, allowed accurate diagnosis. She was referred to vascular surgery for definitive treatment.

Keywords: Pseudoaneurysm, radial artery, yin-yang sign

INTRODUCTION

Arterial pseudoaneurysms, also referred to as false aneurysms, can develop secondary to a vessel injury, sometimes an iatrogenic complication of arterial catheterization or arterial blood draw.^[1] It is not a true aneurysm, in that its wall is not composed of the arterial wall three layers but only the outermost two, as the blood gets trapped between the tunica media and the tunica adventitia.^[2]

CASE REPORT

This is a case of an 18-year-old female with a medical history of IgM nephropathy with resultant end-stage renal disease undergoing regular peritoneal dialysis for the past 2 years. She presented to the emergency department with visual hallucinations and intermittent jerky movements of her distal limbs and trunks and was hospitalized due to her worsening neurological condition.

After serial workups on the neurology ward, mitochondrial gene analysis revealed that she had mitochondrial encephalopathy, lactic acidosis, and stroke-like episodes (MELAS) syndrome.

During hospitalization, she was transferred to the intensive care unit (ICU) because of deteriorating heart function and she received medications for acute decompensated heart failure. Repeated needling for blood tests was performed on bilateral elbow and hand areas, as well as arterial line placement for ICU monitoring in the left radial artery at the level of the wrist.

After discharge, two tender pigeon egg-sized nodules developed on the left wrist and right cubital fossa [Figure 1]. The nodules enlarged gradually over a 1-month period, so she sought medical attention and was referred to the physical medicine and rehabilitation department for a musculoskeletal ultrasound (MSKUS). Prescanning physical findings showed that there was pulsation in the two nodules. MSKUS findings revealed one pseudoaneurysm of the left radial artery at the wrist, measuring approximately 1.5 cm × 1.5 cm × 1.0 cm [Figures 2-4 and Video 1], and another one of the right brachial artery at the cubital fossa,

Address for correspondence: Dr. Tyng-Guey Wang,
Department of Physical Medicine and Rehabilitation, National
Taiwan University Hospital and National Taiwan University College of
Medicine, Taipei, Taiwan.
E-mail: tgw@ntu.edu.tw

Received: 16-05-2019 Revised: 24-10-2019 Accepted: 12-11-2019 Available Online: 16-12-2019

Video Available on: www.jmuonline.org

Access this article online

Quick Response Code:



Website:
www.jmuonline.org

DOI:
10.4103/JMU.JMU_37_19

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Boudier-Revéret M, Lin MT, Wang TG. An unusual volar wrist mass: Radial artery pseudoaneurysm following transradial catheterization. *J Med Ultrasound* 2020;28:117-9.



Figure 1: A picture showing the patient's both elbows extended, and forearms supinated. The continuous arrow points to the large left radial pseudoaneurysm and the dashed arrow points to the smaller right brachial artery pseudoaneurysm

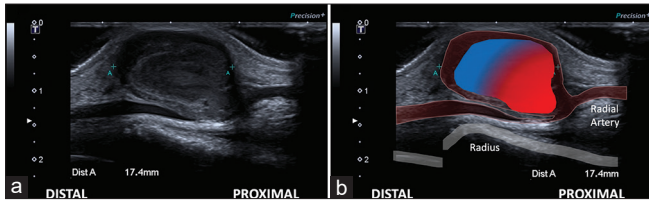


Figure 3: An ultrasound image of the pseudoaneurysm measuring up to 17 mm in the longitudinal axis, without Doppler is shown (a), as well as its schematic representation (b). The stalk of the pseudoaneurysm measured 10 mm

measuring approximately 1.0 cm × 1.0 cm × 1.0 cm, without active blood flow, suggesting complete thrombus formation within the pseudoaneurysm.

She was referred to a vascular surgeon and excision was scheduled. A video case of her left radial artery pseudoaneurysm is presented with this article [Video 1].

DISCUSSION

A pseudoaneurysm, sometimes referred to as a traumatic aneurysm, is the consequence of a tear in the arterial wall with ensuing hemorrhage contained by a thin-walled capsule, which explains why it tends to expand rapidly. It does not contain all three layers of a true aneurysm (intima, media, and adventitia) but only the two outermost ones (media and adventitia).^[3] Management can include early compression, US-guided thrombin injection, or surgical excision.^[4]

On Doppler ultrasound, one can appreciate the typical bidirectional flow caused by swirling of blood, referred to as the yin-yang sign [Video 1]. Although this can be seen both in true and pseudoaneurysms, it is helpful in distinguishing them from other vascular masses such as angiomyolipomas.^[5]

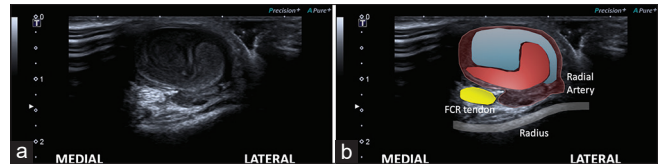


Figure 2: An ultrasound image of the pseudoaneurysm in transverse axis without Doppler is shown (a), as well as its schematic representation (b). FCR: Flexor carpi radialis

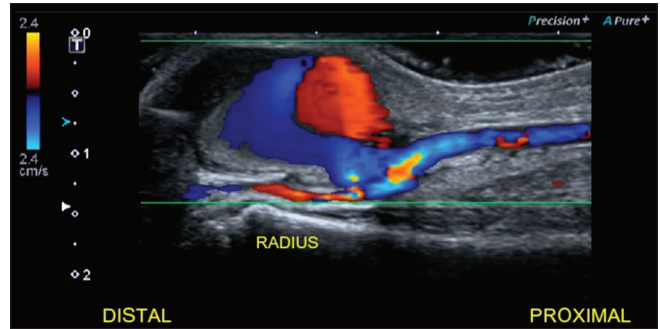


Figure 4: An ultrasound image of the pseudoaneurysm in the longitudinal axis with color Doppler, showing the typical yin-yang sign

The incidence of radial pseudoaneurysm following arterial line placement has been studied in a retrospective chart study of 12,500 patients, and the rate was only 0.048%.^[6]

Even though mitochondrial arteriopathy has been recognized as a pathological entity,^[7] there is no clear association in the literature between MELAS syndrome and pseudoaneurysms, as only one other case report has been published (carotid pseudoaneurysm).^[8]

CONCLUSION

Although physical medicine and rehabilitation specialists are not the ones managing these types of vascular masses, they might encounter them in rehabilitation patients who have had arterial lines while in the ICU or with patients referred for MSKUS in the context of a wrist mass.

Acknowledgments

All persons who have made substantial contributions to the work reported in the manuscript (e.g. technical help, writing and editing assistance, and general support), but who do not meet the criteria for authorship, are named in the Acknowledgments and have given us their written permission to be named. If we have not included an Acknowledgment in our manuscript, it indicates that we have not received substantial contributions from non-authors.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published

and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Kim D, Arbra CA, Simon Ivey J, Burchett P, Gonzalez G, Herrera FA. Iatrogenic Radial Artery Injuries: Variable Injury Patterns, Treatment Times, and Outcomes. *HAND* (2019). <https://doi.org/10.1177/1558944719844348>.
2. Pathak L, Shirodkar S, Ruparelia R, Jhavar A. A radial artery pseudoaneurysm following transradial access treated successfully with external compression dressing—A very rare complication. *IHJ Cardiovascular Case Reports (CVCR)* 2018;2:181-3.
3. Xiao J, Brackney AR. Bedside Ultrasound for Pulsatile Hand Mass A 23-year-old man, who initially presented to an outside hospital's ED for evaluation and treatment of a stab wound, presented to our ED two months later with a pulsatile hand mass. *Emergency Medicine* 2018; 50:77-80.
4. Mahmoud MZ, Al-Saadi M, Abuderman A, Alzimami KS, Alkhorayef M, Almagli B, *et al.* "To-and-fro" waveform in the diagnosis of arterial pseudoaneurysms. *World J Radiol* 2015;7:89-99.
5. Wang CW, Liang PC, Hsieh JT. The yin-yang sign. *Kidney Int* 2009;75:128.
6. Falk PS, Scuderi PE, Sherertz RJ, Motsinger SM. Infected radial artery pseudoaneurysms occurring after percutaneous cannulation. *Chest* 1992;101:490-5.
7. Finsterer J, Zarrouk-Mahjoub S. Mitochondrial vasculopathy. *World J Cardiol* 2016;8:333-9.
8. Ryther RC, Cho-Park YA, Lee JW. Carotid dissection in mitochondrial encephalomyopathy with lactic acidosis and stroke-like episodes. *J Neurol* 2011;258:912-4.