

# A Pseudoaneurysm of the superficial palmar arch following a mini – open carpal tunnel release: A case report

## Abstract

**Background:** Carpal tunnel syndrome (CTS) is a compression of the median nerve as it passes underneath the transverse carpal ligament. Treatment can be either conservative or surgical. After conservative management fails, surgical release of the transverse carpal ligament is indicated. The complications of a carpal ligament release include wound infections, post op pain and persistent paresthesia due to incomplete release. However, pseudoaneurysm formation after a carpal tunnel release is extremely rare and has been previously reported twice in the literature following endoscopic carpal tunnel release.

**Case report:** In this case report, a 61-year-old-gentleman presented to our clinics with a pseudoaneurysm of the superficial palmar arch of the ulnar artery. This patient underwent a mini-open carpal tunnel release 2 months prior to presentation.

**Conclusion:** Pseudoaneurysm formation after a mini open carpal tunnel release is a rare complication. The development of the pseudoaneurysm was most likely due to an iatrogenic injury of the superficial arch of the ulnar artery while performing the carpal tunnel release. Keeping this entity in mind leads to a faster diagnosis and earlier treatment.

**Keywords:** Carpal tunnel syndrome, pseudoaneurysm, ulnar artery, palmar arch, case report

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**Ramzi Moucharafieh,<sup>1,2</sup> Rashad Madi,<sup>3</sup> Hassan Wardani,<sup>2</sup> Mohammad Badra<sup>2</sup>**<sup>1</sup>Department of Orthopedic Surgery and Traumatology, Saint Georges University Medical Center, Lebanon<sup>2</sup>Department of Orthopedic Surgery and Traumatology, Lebanon<sup>3</sup>Department of Orthopedic Surgery, Lebanese American University Medical Center Rizk hospital, Lebanon

**Correspondence:** Ramzi Moucharafieh, Clemenceau Medical Center Affiliated with Johns Hopkins International, Clemenceau Beirut, Email [Ramzi.moucharafieh@gmail.com](mailto:Ramzi.moucharafieh@gmail.com)

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**Abbreviations:** CTS, carpal tunnel syndrome; TCL, transverse carpal ligament

## Background

Carpal tunnel syndrome (CTS) is a compression of the median nerve as it passes underneath the transverse carpal ligament.<sup>1</sup> The carpal tunnel is composed of the transverse carpal ligament palmarly and the carpal bones dorsally and in between nine flexor tendons and the median nerve.<sup>2</sup> The exact pathophysiology of carpal tunnel syndrome has not yet been fully understood but two mechanisms have been proposed: Increased carpal tunnel pressure leads to (1) Mechanical deformation and localized inflammatory changes (2) Transient intraneural ischemia.<sup>3</sup> CTS affects approximately %4.9 to %7.1 of the population making it one of the most common upper extremity neuropathies.<sup>4</sup> The treatment options are either conservative or surgical. If conservative management failed surgical release of the transverse carpal ligament (TCL) is recommended.<sup>5</sup> There are several techniques used to release the TCL: The classical open carpal tunnel release, the mini – open carpal tunnel release and the endoscopic carpal tunnel release.<sup>5</sup> The surgical options available are considered relatively safe and with low rates of post-op complications.<sup>6</sup> These complications include wound infections, post op pain and persistent paresthesia due to incomplete release.<sup>6</sup> Pseudoaneurysms post carpal tunnel are extremely rare and have been reported previously only twice in the literature following endoscopic carpal tunnel release. In this article, we will present a case of a left hand pseudoaneurysm in a 61-year-old gentleman who underwent a mini open carpal tunnel release 2 months prior to presentation.

## Case report

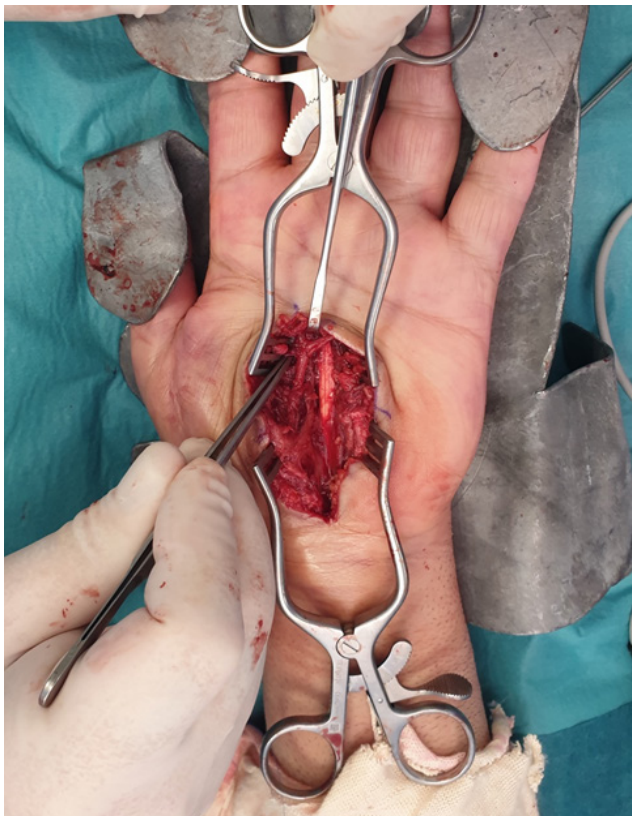
A 61-year-old gentleman, right hand dominant, previously healthy

presented for a two-year history of left wrist pain and numbness that gets worse at night. A clinical diagnosis of carpal tunnel syndrome was made and confirmed by nerve conduction studies. The patient was started on conservative treatment that failed. A consensual decision was done to perform a mini open carpal tunnel release. The surgery was done using a mini transverse incision over the distal wrist crease. The antebrachial fascia was opened, and the transverse carpal ligament was successfully released; the patient was sent home on day 0 post op. The patient presented 3 weeks post op due to a hematoma in the palm and 10 cc of blood were aspirated from the supposed hematoma. Two months post op, the patient presents to the clinic with a painful pulsatile mass in the palm. An ultrasound doppler was done and revealed a (2.7cm x 1.6cm) pseudoaneurysm of the superficial palmar arch. The patient was scheduled for a pseudoaneurysm repair. Intraoperatively, the pseudoaneurysm was identified in the superficial palmar arch (Figure 1 & 2). The vascular branches were small in size; thus, they were ligated. The mass was reported as having a fibrotic vascular wall with reactive changes that is consistent with the diagnosis of a pseudoaneurysm of the palmar arch. The patient had complete resolution of his symptoms immediately post op and no recurrence of symptoms at 12 months post op.

## Discussion

Aneurysms are divided into 2 types: True aneurysms and pseudoaneurysms.<sup>7</sup> Pseudoaneurysms are caused by penetrating lacerations to the hand, yet they are rare despite the large number of hand lacerations worldwide.<sup>7</sup> It is the result of a partial or complete disruption of the arterial wall that leads to blood seeping into the surrounding tissue.<sup>7</sup> Later on, fibrosis of this hematoma leads to the formation of the pseudoaneurysm.<sup>7</sup> Pseudoaneurysms of the hand post endoscopic carpal tunnel release have been reported in 2 articles

previously. The formation of these pseudoaneurysm was attributed to a possible iatrogenic injury while inserting the endoscope.<sup>8,9</sup> In the case presented above, a mini open approach was used which gives a lower exposure of the neurovascular structures. Intra – op vascular injuries can be missed and may later lead to a hematoma and the formation of a pseudoaneurysm, especially when using mini-invasive approaches.<sup>9</sup> Even though, pseudoaneurysms post carpal tunnel are extremely rare, this diagnosis should be thought about and confirmed by an ultrasound doppler.<sup>9</sup>



**Figure 1** Excision of the pseudoaneurysm from the superficial palmar arch.



**Figure 2** The pseudoaneurysm after excision.

## Conclusion

Carpal tunnel syndrome is the most common upper extremity neuropathy in adults.<sup>4</sup> Surgical carpal tunnel release is a common procedure. The complications of this procedure are well known and with low rates.<sup>6</sup> Pseudoaneurysm formation of the palmar arch of the ulnar artery is rare but should be on the list of differential diagnoses when a patient presents with a mass post carpal tunnel release whether it was an open or endoscopic approach. It can be confirmed using an ultrasound doppler.<sup>9</sup> Keeping this entity in mind leads to a faster diagnosis and earlier treatment.

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Name of Department and Institution where work was done Clemenceau Medical Center Affiliated with Johns Hopkins International, Clemenceau Beirut, Lebanon

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## Conflicts of interest

The authors declare that they have no conflict of interest. Patient's written consent for the publication of this case and images was taken.

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