

CASE REPORT

Acute carpal tunnel syndrome caused by thrombosed persistent median artery associated with bifurcated median nerve in a pregnant woman

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SUMMARY

Carpal tunnel syndrome (CTS) is a common form of peripheral nerve entrapment, which is observed due to compression of the median nerve at the level of the carpal tunnel in the wrist. Bifid median nerve and persistent median artery association are rare, and they may be independent risk factors for CTS. These rare entities are usually asymptomatic, but in cases of acute thrombosis or dilatation of the persistent median artery, acute findings can be seen. We report a case of acute CTS due to thrombosis of a persistent median artery and associated bifurcated median nerve during pregnancy.

BACKGROUND

Carpal tunnel syndrome (CTS) is a common form of peripheral nerve entrapment, which is observed due to compression of the median nerve at the level of the carpal tunnel in the wrist.¹ Bifid median nerve, which is known as a high division of the median nerve within the carpal tunnel, is an anatomic variation that is associated with CTS.² Median artery anomalies are also responsible in the etiopathogenesis of CTS. A persistent median artery (PMA) is a rare variation reported in literature.^{3–4} Bifid median nerve and PMA concomitancy are even more uncommon, and they may be independent risk factors for the development of CTS.

CASE PRESENTATION

A 35-year-old and 8-week healthy pregnant woman awoke one morning with swelling and unbearable pain in the dominant right hand wrist extending to the middle fingers. The pain was cramping and increasing by motion. She complained of tingling and paraesthesia in the median nerve distribution area. There were no pre-existing symptoms of CTS. There was no history of trauma.

INVESTIGATIONS

Physical examination revealed tender swelling on the volar aspect of the wrist. There were no skin changes or muscle atrophy. She was a radiologist, so she was quickly examined by a radiologist friend. Sonography and Doppler examination was performed with a high-frequency probe (12 MHz). Each hand was placed on a hard surface in neutral position. At the proximal part of the right wrist, the median nerve branched out in two bundles. The cross-sectional area of the bifid nerve was 0.30 cm².

There was a tubular anechoic structure transversing through the median nerve suggesting a vessel. At the radial-ulnar junction in greyscale, the artery was larger in size and there was an intraluminal echogenic structure (figure 1). No flow was depicted at Doppler examination confirming the distal thrombosis of the artery (figure 2). The aspect and location of the median nerve was normal in the left hand. The cross-sectional area of the left median nerve was 0.06 cm².

TREATMENT

No treatment such as surgery or thrombolysis was offered to the patient because of pregnancy.

OUTCOME AND FOLLOW-UP

Over the following weeks, the patient became gradually less symptomatic with occasional moderate pain in the wrist especially while doing work.

DISCUSSION

The median nerve is an exclusive one in that there is no other nerve running through the carpal tunnel. Several studies have showed that bifid median nerve and PMA association is a potential risk for CTS.⁵ A bifid median nerve and PMA are anatomic variants that have been reported widely in the surgical literature. Their prevalence in the general population is weakly outlined. Prevalence studies, which are mostly on cadavers, have focused on persistent median arteries, and prevalence varies from 0.6% to 30%. The reported prevalence of bifid median nerves is also variable and ranges from 2% to 26% per wrist. The bifid median nerve anomaly has been reported to have an incidence of 0.8%–2.8% in patients with CTS, and in most cases, it has been reported with a concomitant PMA.^{3–4} The median artery, which develops from the axillary artery running parallel to the median nerve, occasionally reverts in the 8 weeks of gestation, but sometimes, when the median artery does not undergo reduction, it calls PMA.⁶

The cause of PMA thrombosis may be associated with trauma,⁷ hormonal contraceptive pills and overdose usage of hand.⁸

In our case, the patient was pregnant. CTS is not a rare complication of pregnancy and can be due to hormonal changes and oedema. Also, during pregnancy, because of hypercoagulability,



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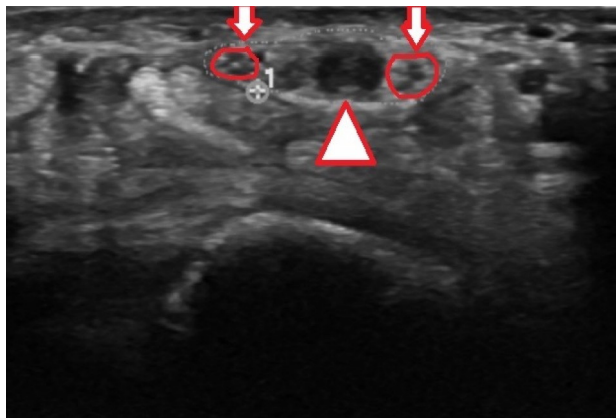


Figure 1 Axial section sonographic and colour Doppler image. Persistent median artery with bifurcated median nerve on its either side (arrows). The vessel was filled with echogenic thrombus (arrowhead). No flow is seen in the lumen.

women have increased risk of both arterial and venous thromboembolism.⁹ In addition, having anatomic variations contributes to this condition. To our knowledge, there is not a case in the English literature that combines CTS, anatomic variations and pregnancy. Early diagnosis and decompression usually relieves the symptoms, thus preventing the need for any surgery or thrombolytics. Our patient was 8 weeks pregnant; thus, she refused surgery and thrombolytic treatment.

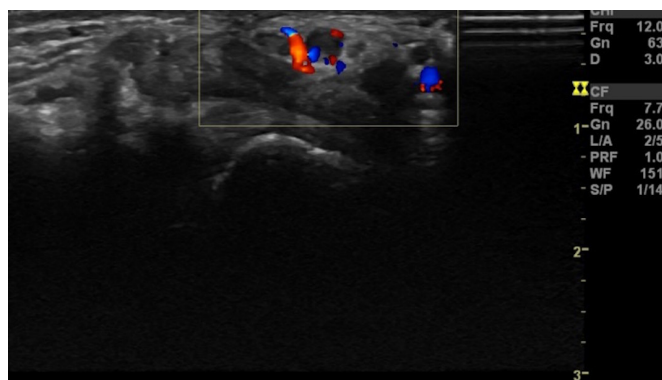


Figure 2 Axial section colour Doppler mapping. Thrombosed persistent median artery. No flow is seen in the lumen (arrow).

In conclusion, acute CTS is rare; thus, when patients present with acute onset of pain and swelling in the wrist, thrombosis of a PMA should be suspected. Sonographic evaluation of the wrist is a fast, relatively inexpensive, non-invasive and effective method for assessing the median nerve abnormalities and atypical vascular structures within the carpal tunnel.

Learning points

- ▶ Bifid median nerve and persistent median artery are rare anatomic variations.
- ▶ When patients present with acute onset of pain and swelling in the wrist, thrombosis of the persistent median artery should be suspected.
- ▶ Sonography is a fast, relatively inexpensive, non-invasive and effective method for assessing the median nerve abnormalities and atypical vascular structures within the carpal tunnel.

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