

Thrombosis of the Princeps Pollicis Artery of the Thumb – Case Report of an Unusual Disease

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Received May 17, 2024; Accepted January 27, 2025.

Key words: Thrombosis – Princeps pollicis artery – Ultrasonography – Doppler

Abstract: In the clinical evaluation of upper extremity embolism cases, the anamnesis should focus on identifying potential triggering risk factors. The physical examination may reveal sensory deficits, aiding in the determination of ischemia stages. Imaging diagnosis is crucial, with computed tomography (CT) angiography being the preferred examination due to its ability to provide detailed information about arterial anatomy across multiple planes and clear visualization of adjacent structures. Compared to magnetic resonance imaging angiography, CT angiography offers faster results with minimal distortion, despite the exposure to radiation and contrast use. Doppler ultrasonography is another valuable tool in suspected arterial thromboembolism cases, particularly in emergency settings. It offers advantages over CT angiography as it is non-invasive, cost-effective, and does not involve radiation or contrast administration. We present the case of a 68-year-old man who reported a nodule in the medial region of his right thumb for three months. Initially, he experienced significant local pain and limited movement, which gradually improved over time with the use of analgesic medication. Ultrasonography revealed thrombosis in the princeps pollicis artery, and the patient commenced treatment with acetylsalicylic acid. After four months, the patient reported a marked reduction in the nodule size along with pain improvement.

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<https://doi.org/10.14712/23362936.2025.6>

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Introduction

Arterial occlusion in the upper limbs has different origins, such as arterial embolism, iatrogenic or traumatic arterial injury, native arterial thrombosis and arteritis, and most often has an acute clinical presentation. Native arterial thrombosis in the upper limbs can originate of atherosclerotic plaque, aneurysm thrombosis, arterial compression, thrombophilia or low blood flow state (Deguara et al., 2005; Bae et al., 2015).

The ulnar and radial arteries unite in the palm of the hand and form the deep palmar arch and the superficial palmar arch. The deep palmar arch is supplied by the radial artery and gives rise to princeps pollicis artery and the radial digital artery of the index finger. Princeps pollicis artery divides into two palmar digital arteries (Miletin et al., 2017). It's estimated that thrombosis in the upper limbs is six times rarer than thrombosis in the lower limbs (Chitte et al., 2003).

Herein we report the case of a 68-year-old patient who attended outpatient care complaining of pain in his right thumb.

Case report

A 68-years-old man reports a nodule in the medial region of the thumb of his right hand for three months. Initially with marked local pain and movement limitation, evolving with improvement over time associated with the use of analgesic medication. He denies trauma at the beginning of the symptoms.

On physical examination, he presents a hardened nodulation that is slightly painful on palpation, on the medial portion of the thumb, without local hematoma and without changes in sensitivity or temperature in the thumb, with preserved strength and movement. Ultrasonography demonstrates thrombosis in princeps pollicis artery (Figure 1).

The patient started treatment with acetylsalicylic acid. After four months, the patient reports a marked reduction in the nodule with improvement in pain.

Discussion

In the clinical evaluation of cases of embolism in the upper extremities, the anamnesis must be guided by the possible triggering risk factors. The physical examination may or may not indicate sensory deficits, determining the stages of ischemia (Rutherford, 2009). Laboratory markers aren't specific for the diagnosis of arterial embolism (Cooke and Wilson, 2010).

Computed tomography (CT) angiography is usually the choice exam, as it provides information about the arterial anatomy in multiple planes, in addition to presenting adjacent structures with good definition. CT angiography, in comparison with magnetic resonance imaging (MRI) angiography, is faster and have less distortion of the images, despite exposure to radiation and the use of contrast (Olin et al., 2004). The use of Doppler ultrasonography in cases of suspected arterial thromboembolism can also be fast in emergency scenarios and has advantages because it's non-invasive, cheaper, doesn't require contrast and is radiation-free (Crawford et al., 2016).

The diagnostic hypothesis for the condition presented by the patient was, initially, a nodule of etiology to be clarified. Initially, princeps pollicis artery thrombosis was not considered. Differential diagnoses, however, vary among artery occlusion, stenosing tenosynovitis, Bennett's fracture, anatomical variations in vascularization that facilitate the reduction of arterial supply to the hand, atheroma plaque in vessels that are the source of embolism and princeps pollicis artery pseudoaneurysm (Parks et al., 1978).

Ezomo et al. (2020) also reported a 61-year-old man referring that his right thumb turned blue the previous morning and had remained blue until the presentation

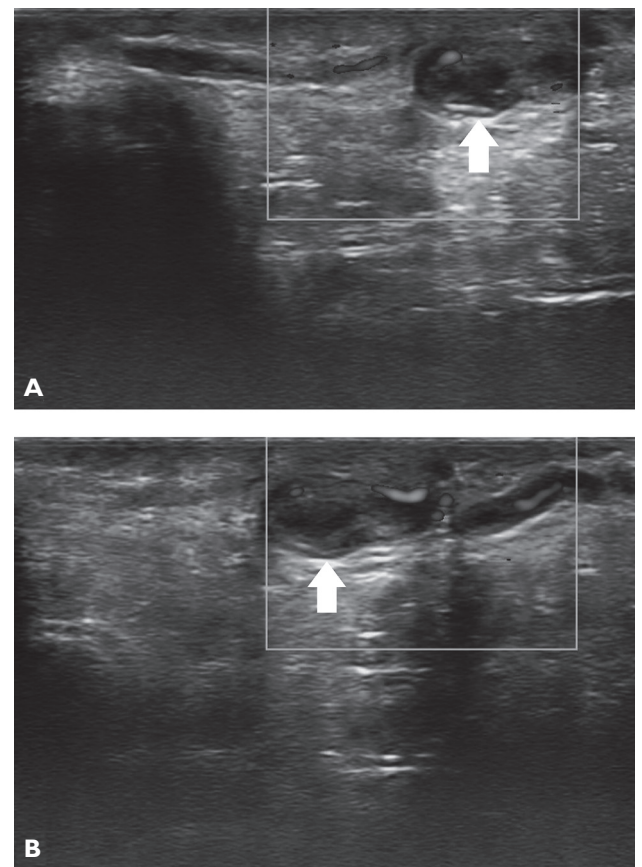


Figure 1: Ultrasonography of the thumb demonstrating thrombosis of the princeps pollicis artery of the thumb (white arrow).

to the physician. The patient stated that his right thumb was cold. The princeps pollicis artery thrombosis was diagnosed by ultrasonography and, also, treated conservatively with clopidogrel in addition to acetylsalicylic acid. The patient experienced full resolution of thumb discoloration over the next few days and experienced no complications or recurrence at follow up visits (Ezomo et al., 2020).

The initial management of princeps pollicis artery thrombosis relies on systemic anticoagulation at diagnosis. The subsequent approach and the need for revascularization are guided by the individual's degree of severity, presence or absence of sensory and motor deficits, and condition of preservation of the flow. Other alternatives are transcatheter embolectomy and catheter-directed thrombolysis (Rutherford, 2009).

Conclusion

The princeps pollicis artery is the main artery of the thumb, but its thrombosis is rare, having just case reports in the medical literature. Although the clinical presentation of the pathology is, in most cases, acute, the patient reported had preserved sensitivity, temperature and movement, in addition to the absence of limb ischemia. For this unusual form of occurrence, Doppler ultrasonography meets the diagnostic needs, without the necessity of the CT angiography or MRI.

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