Introduction

Aneurysms of ulnar artery and palmar arch are rare events (1); they are usually related to repetitive trauma to the involved upper extremity (2) or clinical findings in vasculitis such as Behçet's disease (3). They could be found more frequently in young males, and sometimes are related to anatomical abnormalities of the origin of
Ulnar artery aneurysm: case report and review of the literature

the vessels (4) or infections (5,6). We report a case of true aneurysm of the ulnar and palmar arch artery in a 77 years old man without history of any occupational or recreational trauma, vasculitis, infections or congenital anatomic abnormalities.

Case report

A 77 years old male patient was admitted to hospital with pulsing mass at distal right ulnar artery and deep palmar arch; at ultrasound and CT examination a saccular aneurysm of 35 millimeters at right ulnar artery and a 15 millimeters dilatation at deep palmar arch were detected (Figs. 1, 2 and 3). He was asymptomatic for distal embolization and pain. History was negative for Behcet’s disease, vasculitis, collagenopaties, peripheral catheterization, smoking and drug use. He hadn’t any previous history of infections, except for hepatitis C virus; however, he hadn’t cryoglobulinemia. He hadn’t Marfan disease, even if he had a dilatation of ascending aorta. He denied traumatic event involving upper extremity and he was an engineer so we excluded pseudoaneurysm due to occupational microtrauma. By the clinical history it was a spontaneous true aneurysm of ulnar artery and deep palmar arch. Blood laboratory tests were normal, except for glucose level (113 mg/dL) and a little transaminase elevation (aspartate aminotransferase 63 U/L); he had no eosinophilia. He hadn’t neither a history of artery disease nor peripheral obstructions (all arterial pulses were present) and a duplex of carotid artery was normal. At clinical examination of upper extremity radial and ulnar pulses were present bilaterally but there was a pulsing mass synchronous with heart note at the middle third of the right forearm. Auscultation revealed no heart murmur, and transthoracic echocardiography showed no valvular heart disease and a normal ejection fraction. Due to the risk of rupture and distal embolization we decided to treat those aneurysms with a surgical approach; endovascular therapy was not indicated for tortuosity of the vessels, while thrombin injection couldn’t be performed because there wasn’t a suitable neck. In local anesthesia we performed a resection of ulnar artery and deep palmar arch dilatations (Fig. 4); reconstruction of the vessels was performed using an end-to-end microvascular repair (Fig. 5). Histological examination of ulnar aneurysm confirmed the absence of vasculitis and collagenopaties. The pathologist described just fibrotic tissue with sclerosialnosis and multiple haemorrhagic foci. After the operation there were no clinical signs of peripheral ischemia, Allen’s test and ultrasound examination were normal. At a follow-up of six months, the patient was still asymptomatic with a normal Allen test, no signs of distal digital ischemia and patency of treated vessel with normal flow at duplex ultrasound.

Discussion

Distal ulnar artery and palmar arch aneurysms are uncommon clinical findings. They are usually associated with hypotenar hammer syndrome, which is typically an occupationally acquired disease (7); rarely, they could be found as a clinical sign in vasculitis (3) or in case of abnormal vessel conformation (4).
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and “palmar arch aneurysm”. Most of cases have been reported in young people, usually after violent trauma or repetitive micro-trauma to the involved upper extremity, and they are pseudoaneurysms more frequently, as reported since 1949 in Journal of The Royal Army Medical Corps: the literature of the war, so rich in vascular injuries, has however few examples of these lesions (8).

Occupational true aneurysms of the ulnar artery in the palm have been reported as a result of hypothenar hammer syndrome: this nosological entity is an uncommon vascular overuse syndrome that is caused by trauma to the palmar portion of the ulnar artery, usually as a result of occupational or sports activities which involve repetitive micro-trauma on the heel of the hand. Typically, hypothenar hammer syndrome occurs in men with a mean age of 40 years, who are more frequently vibration-exposed workers, such as metal workers, auto mechanics, lathe operators, machinists, miners, sawmill workers, butchers, bakers, brick layers and carpenters (7). In our case, however, the patient hadn’t either history of occupational nor recreative micro-trauma, as he worked as an engineer and didn’t practice any sports.

True aneurysms have been reported as a result of anomalous vessels’ anatomy, such as congenitally hypoplastic ipsilateral radial artery (9) or ulnar artery arising from the axillary artery (4); sometimes ulnar artery aneurysms are thought to be congenital in origin, as reported in the pediatric population (10). Angio-CT scan of our patient indeed showed a normal conformation of the vessels’ anatomy and origin and the patient reported the occurrence of a pulsating palpable mass of his wrist and palm two years before, and he had been completely asymptomatic.

True aneurysms of ulnar artery and palmar arch can be also clinical findings of vasculitis or collagenopaties. Spontaneous aneurysms of the ulnar artery as a complication of rheumatic vasculitis have been reported since 1958 (11); Seishiro and coll. reported a case of a 54-year-old-man with a non-traumatic pseudoaneurysm of the proximal ulnary artery with eosinophilia (12), while Kisacik and coll. reported a case of a 21-year-old male with a ulnar artery aneurysm and a history of with Behçet’s disease (3). Those rheumatic vasculitis have multisistem involvement and specific clinical findings, such as oral and genital aphthous lesions for Behçet’s disease. Moreover, histological samples have typical lymphocytic infiltration of aneurysmatic vessels’ walls, with irregular necrotic zones and diffuse interstitial fibrosis. In our case, the patient hadn’t any clinical sign of those diseases, and histological samples were not suggestive for vasculitis.

Nguyen and coll. reported a case of ulnar artery aneurysm in a patient with Marfan syndrome (13). This is a multisystem connective tissue disorder, which usually presents with musculoskeletal abnormalities; as for this syndrome, the major cardiovascular manifestation is a progressive dilatation of the ascending aorta, leading to aortic aneurysm formation and eventually to fatal aortic rupture or dissection. As for our case, the patient really had a dilatation of the ascending aorta, but he didn’t fit the Gent criteria for the clinical diagnosis (14).
Vasculitides have also been described as secondary to infections (5,6,15), many viruses can be responsible for systemic vasculitis, the most frequent being hepatitis B virus-related polyarteritis nodosa or hepatitis C virus-related mixed cryoglobulinemia (16). Moreover, some bacteria, fungi or parasites can cause vasculitis, mainly by direct invasion of blood vessels or septic embolization: Inoue and coll. reported a case of mycotic aneurysm of the palmar arch associated with infective endocarditis (5), while Bacourt and coll. reported in 1987 the first case of aneurysm of the ulnar artery in Staphylococcus bovis septicemia (6). Our patient had a history of previous hepatitis C virus infection; however, he hadn’t cryoglobulinemia, and microbiological analysis of the vessel’s sample was negative for bacteria, fungi and parasites.

The patient probably had a true spontaneous aneurysm of ulnar artery and palmar arch, which indeed is a rare event, as reported in literature.

As for treatment, surgery is the gold standard for large aneurysms which have high risk of rupture or distal embolization (17). Technically, the aneurysm is resected; vascular reconstruction could be performed or not (18), using an end-to-end ulnar artery microvascular repair or a bypass with inverted great saphenous vein. A single case of medical therapy has been reported in 1990 by Rothkopf and coll., using long-term anticoagulants (19), while Komorowska and coll. reported two cases of percutaneous thrombin injection for radial and ulnar artery pseudoaneurysms (20).

We chose to resect the aneurysm because of its risk of rupture and chose to restore vessels’ continuity with an end-to-end ulnar artery microvascular repair as the lesion was short and had good proximal and distal diameters. At a follow-up of six months, the patient is still asymptomatic with a normal Allen test and no signs of distal digital ischemia.

**Conclusion**

True spontaneous aneurysms of ulnar artery and palmar arch are a rare event, which can be successfully treated with resection and microvascular reconstruction.

**Competing interests**

No financial competing interests.

**Institutional review board approval**

Our institution approved the report of this case.

**References**