

An Unusual Presentation of Hypothenar Hammer Syndrome

Charles DeCarlo¹, John Phair², Katie Weichman³, Evan Lipsitz² and Karan Garg^{2*}¹Department of Vascular and Endovascular Surgery, Massachusetts General Hospital, USA²Department of Cardiovascular and Thoracic Surgery, Montefiore Medical Center, USA³Department of Plastic and Reconstructive Surgery, Montefiore Medical Center, USA

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*Corresponding author

Karan Garg, Department of Cardiovascular and Thoracic Surgery, Montefiore Medical Center, 3400 Bainbridge Ave, Bronx, NY 10467, USA, Tel: 718-920-8584; Email: kgarg@montefiore.org

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Abstract

Objectives: Hypothenar hammer syndrome is a rare clinical entity, typically presenting unilaterally, in middle-aged men, with a history of persistent trauma to their hypothenar eminence. We report a case of bilateral hypothenar hammer syndrome in a 77-year-old man with no recent occupational exposure.

Methods: We performed an extensive literature search using the Pubmed database and identified less than 175 results on hypothenar hammer syndrome. Only 12 articles referenced bilateral hypothenar hammer syndrome. Additionally, only 16 articles included patients 65 and older. The following search terms were used: hypothenar hammer syndrome, bilateral, "two aneurysms," "multiple aneurysms," and symptoms.

Results: A 77-year-old man who presented with pulsatile hypothenar masses bilaterally and was diagnosed with hypothenar hammer syndrome. He worked as a carpenter 15 years before presentation. He currently uses a rolling walker. CT angiography confirmed the presence of two aneurysms in his dominant right hand, the largest measuring 1.8 cm in diameter. The patient had a motor function deficit along the distribution of the ulnar nerve on the right hand. He underwent resection of the aneurysms in the right hand and reconstruction of the ulnar artery.

Conclusion: Unusual aspects of this case include age of presentation, bilateral aneurysms, and lack of recent occupational exposure. We assert that the use of a rolling walker may have contributed to the progressive aneurysmal degeneration of his ulnar artery.

Introduction

Hypothenar Hammer Syndrome (HHS) is a rare clinical entity that manifests as thromboembolic occlusive disease in the ulnar and digital arteries, or aneurysmal disease of the ulnar artery. It usually presents in middle-aged men and is generally associated with occupations involving repetitive trauma to the hypothenar aspect of the palm. We report the presentation, diagnosis, and treatment of a patient with late onset bilateral hypothenar hammer syndrome. We hypothesize that while his initial occupational exposure likely contributed to the aneurysm formation, the use of a rolling walker may have led to continued degeneration, and his late presentation.

Case

A 77-year-old man with a past medical history of hypertension presented with a 3-month history of a pulsatile mass in his right hand. The patient denied digital pain, cold intolerance, cyanosis, numbness, tingling, or ulceration. The patient, a former smoker, had worked as a carpenter for 30 years, but had been retired for the past 15 years. The patient reported that he started using a rolling walker to ambulate 6 months ago. The patient had palpable pulsatile masses on his hypothenar eminences, bilaterally. Mild adductor wasting and weakness along an ulnar distribution was noted on the right hand; there were no left-sided deficits. Normal brachial, radial, and proximal ulnar pulses were present bilaterally. Allen's test revealed normal perfusion of the hands from both the ulnar and radial arteries.

CT angiography revealed a 2.8 x 1.8 x 1.6 cm, partially thrombosed aneurysmal segment of the ulnar artery (Figure 1). There was a second 7 mm x 6 mm aneurysm of the superficial palmar arch, proximal to the takeoff of the common digital palmar arteries. The left distal ulnar artery was also aneurysmal, measuring 5 mm x 5 mm (Figure 2). There was no radiographic evidence of vascular pathology outside the hands.

The patient was offered open repair of the aneurysm. The aneurysm was circumferentially dissected and freed from surrounding tissue with normal artery proximally and distally for vascular control. The patient was heparinized; vascular control was achieved and the aneurysm was resected (Figure 3). The ulnar artery was repaired with a primary end-to-end anastomosis using interrupted 7-0 Prolene stitches. The aneurysm was opened on the back table and revealed laminar thrombus.

Patient was seen again three months post-operatively. He had no complaints and was feeling well. His strength was 5/5 in both hands. The right ulnar artery anastomosis was patent with a

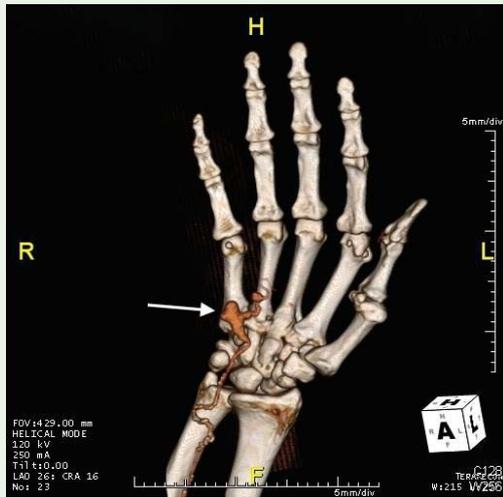


Figure 1: CT with contrast (3D reconstruction) of right hand showing ulnar artery aneurysm (arrow).



Figure 2: CT with contrast (3D reconstruction) of left hand showing ulnar artery aneurysm (arrow).

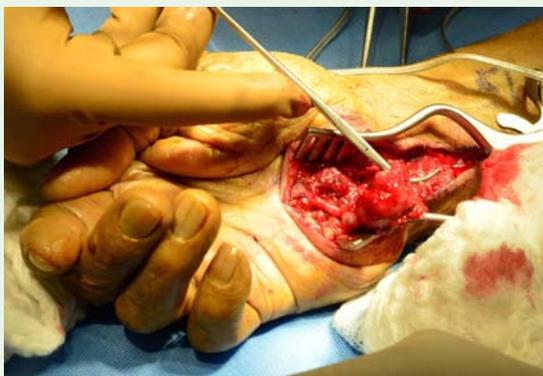


Figure 3: Right ulnar artery aneurysm dissected away from surrounding tissue.

peak systolic velocity of 66 ml/s. Repair of the left-sided aneurysm is planned pending cardiology evaluation.

Discussion

The pathogenesis of (HHS) is related to damage to the intima of the ulnar artery, resulting in thrombus formation, or media, resulting in aneurysm formation [1]. Thromboembolism is more common and presents with sudden digital pain, cold intolerance, cyanosis, numbness, tingling, and ulceration [2]. Aneurysmal disease is less common and manifests as a pulsatile mass, with or without the aforementioned symptoms [3]. Patients generally report unilateral symptoms in the dominant hand [4-7]. Bilateral symptoms may suggest systemic disease. The syndrome typically affects middle-aged men; mean age of presentation is early to mid forties [4,6,8]. Occupational exposure to repetitive trauma to the hypothenar aspect of the palm is a widely reported risk factor; at risk professions include carpenters, mechanics, metal workers, and bricklayers [6]. HHS has also been described in certain recreational activities in which force is applied to the hypothenar aspect of the hand, such as mountain biking, badminton, tennis, weightlifting, and hockey [3]. It has been hypothesized that patients with preexisting palmar ulnar artery fibrodysplasia have a propensity for the disease [8].

Although the patient had previously worked as a carpenter, he did not report any symptoms during his years of occupational exposure. Rolling walkers have not been reported in association with HHS, but the patient likely places substantial weight on the hypothenar aspects of his hands while using his walker in a similar fashion as other activities that have been reported in connection with HHS such as mountain biking, the use of crutches, typing on a laptop computer [9,10]. Testing for systemic disease was deferred given his lack of other symptoms. Due to the atypical aspects of this case, including the age of presentation and bilaterality of symptoms, we hypothesize that the use of a rolling walker was the inciting factor for the development of HHS in this patient.

It is difficult to determine the true prevalence of HHS. A prospective field study of mechanical workshop employees revealed that, of 79 men who gave a history of habitually using their hands as hammers, 14% had objective evidence of ulnar artery occlusion [11]. These 11 men all described symptoms of vascular insufficiency but in no case, were the symptoms severe enough to interfere with the patient’s ability to work. While most reported cases of HHS involve severe symptoms, it is important to recognize that this is most likely an underdiagnosed disease. We suspect that many patients who are dependent on a rolling walker have mild symptoms of HHS that do not interfere with their daily life.

Indications for surgical intervention in patients, in the setting of a reconstructable lesion on angiography or intraoperative assessment, include: 1) failure of medical management to relieve symptoms of digital ischemia, 2) failure of local treatment to heal any digital soft tissue problems, 3) to prevent distal embolization in the presence of a partially thrombosed aneurysm of the ulnar artery, 4) to remove a painful thrombotic mass or necrotic tissue, and 5) to relieve ulnar nerve compression [12-14]. While conservative and medical management should be trialed before surgical options are considered [3,14], it is the authors’ opinion that that all patent, ulnar artery aneurysms should be repaired to prevent distal embolization. Ligation and resection followed revascularization are both reasonable repair

strategies; lack of collateral flow would necessitate revascularization with an end-to-end anastomosis, interposition grafting, or bypass grafting [12]. Digital flow following ligation can be assessed intraoperatively with Doppler or ultrasound [14]. Simple ligation would have been reasonable in this patient since he did not have adequate collateral flow, but end-to-end anastomosis was performed due to the excess length of the ulnar artery which made the anastomosis technically straightforward.

Conclusion

Based on his age and time frame of symptoms, one may conclude that 30 years of previous occupational exposure combined with a predilection for the disease produced subclinical pathology in his ulnar arteries, which was exacerbated by using a rolling walker.

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