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Case report

Unusual case of hypotenar Hammer Syndrome and carpal tunnel syndrome association

Micaela Pagliari, Carlo Raimondo Menna, Avraam Christodoulidis, Michele Soldà, Marco Molinari

Department of Orthopedic Surgery, Ospedale di Fiemme, Cavalese, Trento

Summary. *Background and aim of the work:* Hypothenar Hammer Syndrome is a relatively rare disease process caused by repetitive stress or injury to the hypothenar eminence leading to chronic injury to the ulnar artery. Our study reports an unusual case. *Methods:* A 57 years old Plumber presented in April 2016 with a history of constant pain and recurrent paresthesia involving the fingers of the right hand for several months, over the previous 1 year, his hand had become more intolerant of exposure to cold temperatures. Angio-RNM and electromyography were performed and showed a severe double compression of ulnar and median nerve and an ulnar artery deformity without thrombosis. Surgery was performed under sedation and axillary anesthesia. *Results:* After surgery patient' symptoms immediately improved, and within a few months, his hand had normalized. *Conclusion:* Hypothenar Hammer Syndrome is a rare disease process which manifests in certain occupations and activities that put undue stress on the hypothenar area. Furthermore, the carpal tunnel syndrome, a pressure damage of the median nerve, caused by repetitive manual tasks with flexion and extension of wrist has been added as well as hypothenar hammer syndrome which are vascular damages of hand caused by shock-type application of force. (www.actabiomedica.it)

Key words: hypothenar Hammer Syndrome, ulnar artery, ulnar nerve, median nerve

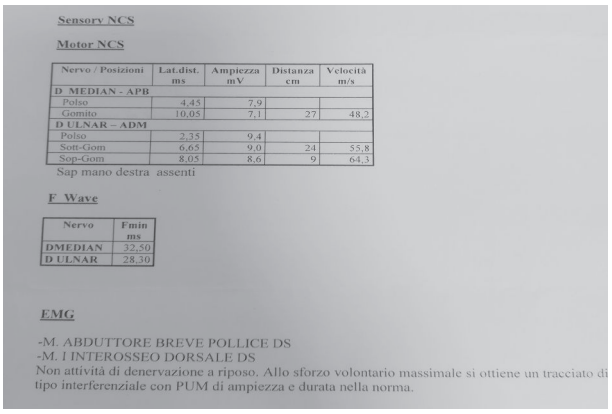
Introduction

Hypothenar Hammer Syndrome (HHS) was initially described by Von Rosen in 1934 and named by Conn in 1970 (1). The superficial palmar branch of the ulnar artery lies directly over the hook of the hamate bone and is therefore susceptible to repetitive trauma, which may result in arterial thrombosis or subsequent aneurysm formation with possible distal embolization (2). Ulnar artery alteration can cause compression of the sensory branch of the ulnar nerve (3). In 2006 a large cohort study revealed the incidence rate for HHS to be 1,6% (4). Although the diagnosis can be confirmed easily with elettromiography and sonography, by showing altered ulnar nerve conduction and irregularity of the superficial ulnar artery (tortuosity, aneurysm, thrombosis), MRI and MR angiography (MRA) provide a comprehensive evaluation of the hypothenar region (5). Artheriography can be used but it is more invasive. There is still no standard treatment for HHS due to difference in clinical symptoms and less of previous study information (6). Initial descriptions of treatment of HHS involved primarily conservative therapy: avoidance of using the palm to strike object, smoking cessation, and use of calcium-channel blockers (2). More recent reports, however, have emphasized surgical treatments, such as thrombolysis, aneurysm exclusion and arterial reconstruction (1, 7, 8).

We report a case of a patient with severe double compression of ulnar and median nerve and an ulnar artery deformity without thrombosis. Accordingly, we present patient's records, clinical examination, imaging data and the management employed.

Case report

The authors have obtained the patient's informed consent for print and electronical publication of the case report. In April 2016, a 57 years old Plumber showed up at our clinic, with a history of constant pain and recurrent paresthesia involving the fingers of the right hand for several months, over the previous 1 year, his hand had become more intolerant of exposure to cold temperatures. Physical examination revealed a positive Tinel for both median and ulnar nerve. Both radial and ulnar artery pulse was normal and Allen's test was also normal. No ischemic lesions were noted in the finger of the right end. Capillary refill was delayed in all finger of the right hand compared with the uninvolved extremity. The patient exhibited good general condition, he was a smoker (15 cigarettes a days). No other co-morbidities were noted. The patient subsequently underwent elettromiography which confirm a severe double compression of both ulnar and median nerve (Fig. 1). Magnetic resonance angiography showed ulnar artery tortuosity without thrombosis. Serological and hematological tests were normal. Surgical procedure was performed under sedation and axillary anesthesia. A longitudinal type incision was made from the distal portion of forearm over the ulnar and hypothenar eminence area and the Guyon tunnel and the surrounding area were explored. Separation of the ulnar artery from the ulnar nerve was started slightly above the level of the wrist, which showed a perivascular inflammatory adhesive reaction without sign of thrombosis. Subsequently a syndesmotomy was performed on the ulnar side of the carpal ligament. There were no postoperative complications and all symptoms (pain, paresthesia and intolerance to cold temperature) were resolved. The patient was discharged home the day after operation on full dose aspirin. After 2 months patient returned to work, he stopped smoking. At the latest follow-up he had no kind of trouble and normal hand function (Fig. 2, 3, 4).



Sensory NCS

Motor NCS

Nervo / Posizioni	Lat.dist. ms	Ampiezza mV	Distanza cm	Velocità m/s
D MEDIAN - APB				
Polso	4,45	7,9		
Gomito	10,05	7,1	27	48,2
D ULNAR – ADM				
Polso	2,35	9,4		
Sott-Gom	6,65	9,0	24	55,8
Sop-Gom	8,05	8,6	9	64,3

Sap mano destra assenti

F Wave

Nervo	Fmin ms
DMEDIAN	32,50
D ULNAR	28,30

EMG

-M. ABDUTTORE BREVE POLLICE DS
-M. I INTEROSSEO DORSALE DS
Non attività di denervazione a riposo. Allo sforzo volontario massimale si ottiene un tracciato di tipo interferenziale con PUM di ampiezza e durata nella norma.

Figure 1. Elettromiography

Discussion

The ulnar artery has a superficial course at the wrist as it crosses laterally to the hook of hamate carpal bone (Guyon tunnel). This special anatomy makes the ulnar artery more prone to repetitive trauma in certain professional and sport activities (9). HHS is most commonly observed in people exposed to acute blunt, vibratory, or repetitive chronic trauma to the hypoth-

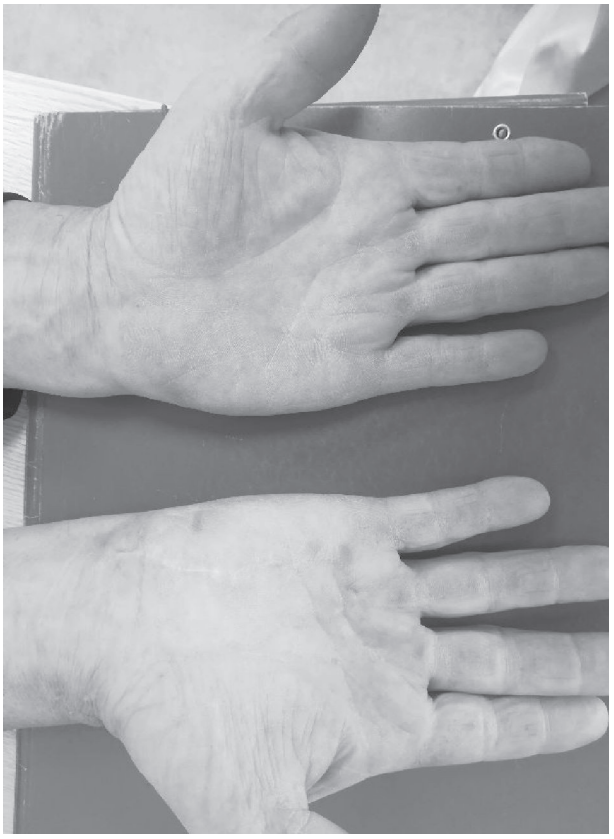


Figure 2. Clinical photos at 1 years follow-up

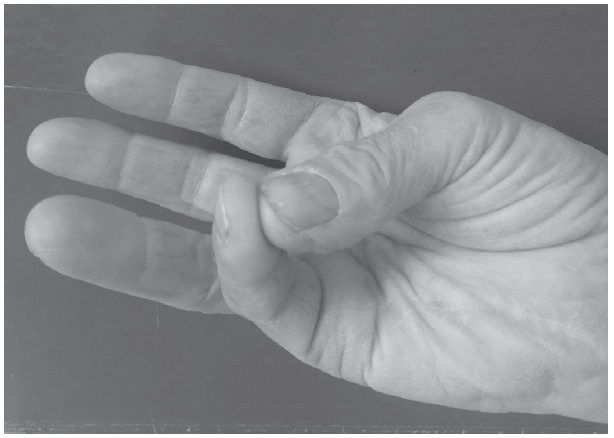


Figure 3. Clinical photos at 1 years follow-up

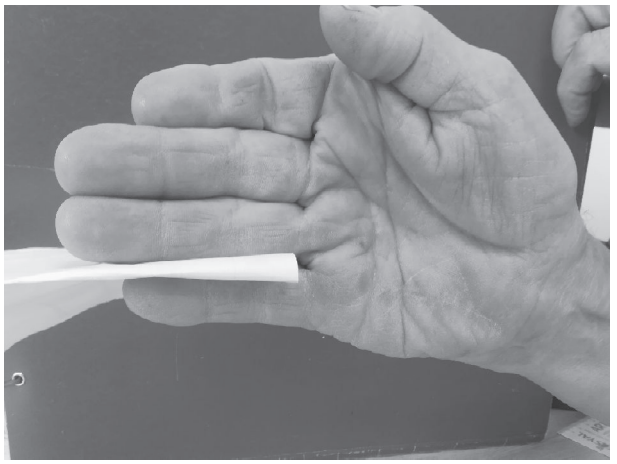


Figure 4. Clinical photos at 1 years follow-up

enar muscle like in carpal tunnel. However, association between carpal tunnel syndrome and ulnar nerve entrapment at wrist remains controversial (10). A review of current literature reveled that reports related to management of hypothenar hammer syndrome are limited (11,12).

Conclusion

Symptoms at the time of presentation are dependent on the extend of arterial damage. Timely diagnosis of HHS is important for minimizing potential serious complication (13). In delayed diagnosis, it may be possible to have further thrombosis of the run-off artery and the patient may suffer from the complication of HHS such as distal embolization, hand claudication or amputation. Early diagnosis and treatment may improve treatment outcome. There is no consensus concerning the diagnosis and treatment of HHS. In addition, the diagnostic algorithm is complex because of the disease's rarity and wide range of symptoms (14). HHS is still under diagnosis and treatment due to unrecognized by the patients and their primary care physician. This case demonstrated the importance of early diagnosis which can avoid serious complication and more aggressive surgery. Further studies regarding management of hypothenar hammer syndrome are needed to delineate an effective standard treatment regimen.

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Correspondence:
Micaela Pagliari
Tel. 0462242280
Fax 046224141
E-mail: micaela.pagliari@apss.tn.it