

Is There A Correlation between Carpal Tunnel Syndrome and Hepatitis C Virus Infected Patients? (Preliminary Report)

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ABSTRACT

Carpal tunnel syndrome (CTS) is the most common compressive neuropathy of the upper extremity. The diagnosis is based on the patient history, physical examination and is confirmed by electrodiagnostic testing. Treatment methods range from observation to surgical intervention. HCV is generally asymptomatic disease, resulting in delayed diagnosis. Numerous extrahepatic manifestations have been reported in association with HCV infection including peripheral neuropathy. So the patient may be presented by extrahepatic manifestations. Some patients presented by CTS and during preoperative preparation showed positive HCV markers. After exclusion of other possible cases of CTS. We ask a question is there a correlation between CTS and HCV or not?. What the efficacy of surgical treatment among these patients?. 40 patients (48 hands) underwent CTS decompression with mean follow-up 3 months. Done under local infiltration anesthesia and median nerve block or local intravenous anesthesia. A forearm tourniquet. Transverse incision at the proximal crease of wrist or longitudinal palmar incision; complete division of the transverse carpal ligament, close in layer, dressing and creep bandage. Post operative elevation for at least 12 hours antibiotic anti-inflammatory analgesic for 5 days.

Results: Age of patients ranged from 26 to 55 years. 29 Females and 11 Males were included in the study. 13 (32.5%) patients were HCV positive among this study discover during preoperative investigation. The tourniquet time was (range, 5-11) minutes and the length of the operation was (range, 8-18) minutes the forearm tourniquet was tolerated well by all patients. All the wounds healed without problem and patients could use their hands for self care after (1-7) days. Incision scars were usually invisible or indistinguishable from skin lines but patients with the palmar incision complaining from tenderness during follow-up period. All patients had complete or near complete resolution of preoperative pain and numbness and completely satisfied with the procedure. Except 5 patients from patients who discovered as positive HCV. The patient's symptoms continued after the carpal tunnel release. 6 patients preferred the short incision at wrist technique.

Conclusion: Every patient with CTS with unexplained cause must be investigated for HCV. Patient with CTS may be positive HCV in about 13 patients 32.5% (5). 12.5% patients not improved by operation. So Further studies on large number of patients to determine factors incriminated in the pathogenesis of CTS in HCV patients why some patient not improve surgically.

INTRODUCTION

Carpal tunnel syndrome (CTS) is the most common compressive neuropathy of the upper extremity as a result of median nerve compression, and because it continues to be diagnosed with increasing frequency, it remains the most common hand operation performed [1].

The patient reports pain, weakness, and paresthesias in the hand and digits. The etiology of this condition is multifactorial; anatomic, systemic, and occupational factors have all been implicated [2].

The diagnosis is based on the patient history and physical examination and is confirmed by electrodiagnostic testing. Treatment methods range from observation and splinting, to cortisone injection and splinting, to surgical intervention. Both nonsurgical and surgical management provide symptom relief in most patients [3].

Hepatitis C virus (HCV) is a serious worldwide health problem. The prevalence in the general population ranges between 0.2 and 2% [4].

HCV is generally asymptomatic disease, resulting in delayed diagnosis which may be at a late stage. Numerous extrahepatic manifestations have been reported in association with (HCV) infection including neuropathy, renal disease, lymphoma and sjogren syndrome with or without mixed cryoglobulinaemia, diabetes have also been linked to HCV. So the patient may be presented by extrahepatic manifestations before hepatic manifestations [5-6].

Some patients presented by CTS and during preoperative preparation showed positive HCV markers. After exclusion of other possible cases of CTS. We ask a question is there a correlation between CTS and HCV or not?. And the efficacy

of surgical release of transverse carpal ligament among these patients.

PATIENTS AND METHODS

40 patients, from adult age groups with no specific sex predilection, were selected from attendants of Plastic and Reconstructive Surgery Departments and Neurology Departments; Al-Azhar University Hospitals. They were 29 females and 11 males and their ages were ranging from 26 to 58 year.

These patients were suffering from pain and parasthesias of the palmar and dorsum side of the hand, worse at night and with repetitive use. Phalen's test and Tinel's signs may be positive; these support a CTS diagnosis but are not specific.

Exclusion criteria:

Patients with diabetes mellitus, renal failure, severe hypertension, rheumatic or ischemic heart disease, vitamin deficiency and collagen disorders that may alter the patient immune status. Other associated conditions that can cause neuropathy e.g. diseases such as lymphoma and medications. Patients with intravenous drug abuse and alcoholics and patients with known history of HCV infection.

All patients were subjected to:

Thorough history taking, General examination, Neurological examination, Laboratory investigations: [Complete blood count, Liver function tests. Kidney function tests, Random blood glucose level. Viral markers (HCV-Ab and HBs-Ag) by ELISA].

Nerve Conduction Studies (N.C.S.) of median nerve (By using AMG Advantage 3000): Placing the limb in a relaxed and comfortable position both for the patient and the examiner. Lowering the electrode impedance as much as possible using electrode gel under the electrode. A ground electrode should be attached to the tested limb and is ideally placed between the stimulating and recording electrodes to reduce the stimulation artifact. Reduction of the pain of the stimulation as much as possible, also shortest duration and lowest intensity but adequate to produce supra maximal stimulation response [7].

Median motor study:

Recording site: At the abductor pollicis brevis muscle (lateral thenar eminence): G1 placed over the muscle belly. G2 placed over the first metacarpal-phalangeal joint. The stimulation site: -Wrist: Middle of the wrist between the tendons to the flexor carpi radialis and palmaris longus.

Distal stimulation point: 7cm proximal to the recording electrode measured along the course of the nerve [8].

Median sensory study:

Recording site: At the index or middle finger. G1 placed over the metacarpal-phalangeal joint. G2 placed 3-4cm distally over the distal interphalangeal joint.

Stimulation site: -Wrist: Middle of the wrist between the tendons to the flexor carpi radialis and palmaris longus. The distal stimulation point: 13cm proximal to the recording electrode measured along the course of the nerve [8].

Normal values: Median nerve:

Motor: Amplitude: >4 Sensory: Amplitude: >20
Velocity: >4 Velocity: >50
Latency: <4.4 Latency: <3.5

Surgical technique:

40 patients (48 hand) underwent carpal tunnel decompression with mean follow-up 3 months. 14 patients bilateral, 6 patients was operated by other surgeon before by open palmar incision; 15 patients were performed under local infiltration anesthesia and median nerve block at the wrist and 25 patients were performed under local intravenous anesthesia. A forearm tourniquet was used and a rolled towel was placed under the wrist to provide 30 to 45 extension.

Transverse incision at the proximal crease of the wrist for 25 patients and longitudinal incision was placed proximal to transverse line from the ulnar side of abducted thumb in line with ring finger in 15 patients; incision of the fascia and identification of median nerve and protect it and complete division of the transverse carpal ligament, the cut edges of flexor retinaculum were then retracted to inspect the canal contents and to check the completeness of the division of this structure. The tourniquet was released, haemostasis was obtained and close the fascia followed by skin closure and dressing and creep bandage. Post operative elevation for at least 12 hours and the patient encouraged to use their hands only avoiding activities requiring force during the first 3 weeks, antibiotic, anti-inflammatory, analgesic for 5 days.

RESULTS

Age of patients ranged from 26 to 55 years with peak incidence at 35 to 45 years. 29 Females and 11 Males were included in the study.

13 (32.5) % patients were HCV positive among this study discover during preoperative investigation. 7 patients showed bilateral CTS.

The mean tourniquet time was 7 (range, 5-11) minutes and the mean length of the operation was 11 (range, 8-18) minutes the forearm tourniquet was tolerated well by all patients.

All the wounds healed without problem and patients could use their hands for self care after a mean 3 (range, 1-7) days and the mean time to return to full activities or work after 3 weeks. Incision scars were usually invisible or indistinguishable from skin lines especially the wrist incision but patients with the palmar incision complaining from tenderness for during follow-up period.

All patients had complete or near complete resolution of preoperative pain and numbness and completely satisfied with the procedure. Except 5 patients from patients who discovered as positive HCV 2 of from bilateral cases. The patient's symptoms continued after the carpal tunnel release and she was not satisfied with the result. 6 patients in our study had had an open CTS release in their hand before and they all preferred the short incision at wrist technique rather than palmar incision.

DISCUSSION

CTS in its idiopathic form, is an extremely frequent entrapment neuropathy in the clinical practice. Several extrinsic or intrinsic processes are involved in the etiology of such a syndrome: Some of them are common whereas others are rare. The latter may pose particular management issues and they may require specific diagnostic, therapeutic, and rehabilitative expedients [9].

We observe some patients presented by CTS and during preoperative preparation showed positive HCV markers. After exclusion of other possible cases of CTS. We ask a question is there a correlation between CTS and HCV or not. Therefore we report 40 cases of carpal tunnel and the result 32.5% positive HCV marker.

HCV infection may be associated with numerous extrahepatic manifestations such as, mixed cryoglobulinaemia, membranoproliferative glomerulonephritis, sicca syndrome or porphria cutanea tarda. Peripheral neuropathy (PN) may also be associated with HCV infection and it is usually related to mixed cryoglobulinaemia, before HCV was discovered [10]. Multiple studies were performed to study the peripheral neuropathy in hep-

atitis C virus and its relation to cryoglobulinaemia [5-6].

No report in literature describe the PN which occur in HCV patient is a compression type of neuropathy also No report in literature correlate between the HCV and occurrence of CTS but in our study 32.5% of the patients are positive HCV. So further study needed on large number of patient to determine factors incriminated in the pathogenesis of CTS in HCV patients.

As regard the pathophysiology of HCV-related PN remains largely speculative; vascular deposition of HCV RNA containing CG, direct viral infection or perivascular mononuclear inflammatory cells may be at the origin of HCV-associated inflammatory vascular lesions [11]. However, it is likely that, HCV neuropathy results from virus-triggered immune-mediated mechanisms rather than from direct nerve infection and in situ replication these can explain why some patient 5 (12.5%) with HCV positive not improve after the operation.

The explanation of PN in HCV patients is by different mechanisms, the first, is cryoglobulinaemic neuropathy which is immune mediated demyelination, deposition of cryoglobulins causing ischaemic nerve injury and vasculitis-induced nerve damage; The second, is HCV- associated guillian-barrie syndrome and the third, is non cryoglobulinaemic neuropathy which can be explained by occurrence of serum sickness-like state that leads to vasculitis in the vasa nervosum [12].

The explanation may be vasculitis induced nerve damage as there is vascular infiltrates in nerve tissue in vasculitis which are composed of T cells and macrophages and such cells are thought to play a role in vasculitic lesions, where these cells express certain molecules which may lead to neural vessel injury. The vascular infiltrates lead to vasculitis, perineuritis and wide spread vessel damage producing ischaemia [12].

CTS can be performed by open or blind techniques. The advantage of the open technique is easy identification of vulnerable structures and their protection, but a longer incision is required which extend to, or beyond, the wrist flexion crease.

Blind release can be performed through a transverse incision at the wrist, but the superficial palmar arch, which lies a few millimeters beyond the distal end of the flexor retinaculum, may be cut inadvertently or the flexor retinaculum release may be incomplete [1-3]. In our study no compli-

cation occur by two technique used. Patient prefer small incision at wrist than other incision.

Conclusion:

Every patient with CTS with unexplained cause must be investigated for HCV.

HCV is generally asymptomatic disease and may be presented by extrahepatic manifestations one of them is peripheral neuropathy may be CTS in about 13 patients 32.5%. (5) 12.5% patients not satisfied by the operation because of persistent symptoms.

Surgical release of traverse carpal ligament may be or may not improve the symptoms of CTS in patient with HCV patients.

Further studies on large number of patients to determine factors incriminated in the pathogenesis of CTS in HCV patients why some patients not improve surgically.

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