Internal NeurolysisVersus Ligament Division in Carpal Tunnel Syndrome Surgery

Abdulrahman Saeed Ahmed (MBChB, FICMS) [1] **and YasinThamer** (MBChB, FICMS)[2]

Abstract

Background: Carpal tunnel syndrome is a compression neuropathy of median nerve at the wrist underneath the flexor retinaculum ligament. It is extremely more common in females than males and usually responds to conservative line of treatment and surgery is recommended after failure of the conservative treatment .

Objective: To evaluate the effect of internal neurolysis on the clinical outcome of carpal tunnel surgery.

Patients and Methods: Forty-eight patients with clinically proved carpal tunnel syndrome were divided into two equal groups; group A were submitted to division of flexor retinaculum ligament only while group B underwent internal neurolysis in addition to division of flexor retinaculum. The two groups have been compared postoperatively on clinical basis for an average period of (4) months. The study had been done prospectively in the period from January 2014 to August 2016 in Ba´quba Teaching Hospital.

Results: All the cases had beensatisfied with the outcome of surgery in both groups,with recurrence in one case only in group A which responded well to conservative treatment.

Conclusion: There was no significant difference in the outcome of both groups in which the addition of internal neurolysis is not necessary and it had no striking effect on the outcome of carpal tunnel surgical decompression.

Key words: Carpal Tunnel Syndrome, Neurolysis.

Corresponding Author: dr-saeed8688@hotmail.com .

Received: 25th December 2016

Accepted: 14th May 2017

[1,2] Baquba Teaching hospital -Diyala - Iraq .

Introduction

Carpal tunnel syndrome (also called tardy median nerve palsy)is the most common nerve entrapment neuropathy of the peripheral nerves its due to compression of the median nerve at the wrist underneath the flexor retinaculum ligament[1][2]. it occurs in both sex, although females show an extremely higher incidence than males, accounting of more than 80 % of all cases and the mean age is 50 years old [2].

Anatomically, carpal tunnel is an unyielding cavity connecting the volar aspect of the forearm with the palm, it is bounded by the arch of the carpal bones dorsally, hook of hamate, triquetrum and pisiform medially, scaphoid, trapezium and flexor carpi radialis tendon sheath laterally and the roof is formed by the flexor retinaculum which is composed of the deep fascia of the forearm proximally ,the transverse carpal ligament over the wrist and the aponeurosis between the muscles of the thenarand hypothenar eminence [1].

Median nerve runs between the tendons of the Palmaris longus medially and flexor carpi radials laterally and it is the most superficial

structure in the carpal tunnel. The increase in the pressure of the carpal tunnel(>20-30)mm Hg impedes the epineurial blood flow and interferes with the nerve conduction [1] [3]. Surgical release of the tunnel reduces pressure, allows for restoration of the intraneural blood flow and physiological function [4]. Electromyogram and nerve conduction study are confined to cases with atypical presentation however the false negative rate is about (10 %) [1] [2].The usual line of treatment of carpal tunnel is conservative one and surgery is the resort after failure of the conservative treatment specially when the symptoms are intolerable [5].The surgery is usually done under local anesthesia[1] [2].

The present study aims to evaluate the effects of internal neurolysis on the clinical outcome of carpal tunnel surgery.

Materials and Methods

This study was done in Ba´quba teaching hospital in the period from January 2014 to August 2016 .The females were 46 cases (95.8%) while the males were (2) cases only (4.2%). All the cases were unilateral involvement. The age of the patient were ranging from (21-60) years.

Pregnant women ,recurrent carpal tunnel syndrome after surgery ,severe thenar muscle wasting, and severe cervical spine spondylosis were excluded from this study.

The total number of cases was (48) which were divided into two equal groups. Group A in whom only division of the flexor retinaculum was done and group B for whom division of the retinaculum plus epineurotomy were done .

Most of the patients were diagnosed on clinical bases and the EMG and NCS was requested in doubtful cases only. Local anesthesia was used in (38) cases while the general anesthesia was used in (10) cases.

In the surgical procedure Esmarch tourniquet is wrapped on the upper arm and after preparing the area, a longitudinal volar incision of about (5)cm long is done,releasing the flexor retinaculum in both groups of patients. In group B, releasing of the ligament is done in addition to internal neurolysis by doing epineurotomy of the median n.

The usual time of surgery in both groups was ranging from (10-15) minutes.All the patients were discharged from the hospital on the same day of the operation with analgesia on need.

Each patient was followed up by (5) visits ;the first visit after two days for change of dressing , the second visit after (8-10)days for removal of stitches then after (1) month, (3) months and (6) months postoperatively for reevaluation.

Each patient is advised to return back practicing her daily activities one month postoperatively .

Result

All the patients in both group A and group B had expressed their satisfaction with the results of the surgery. Only (1)patient (2%) from each group had superficial infection which had been managed successfully by systemic antibiotics. One patient (2%) from group A had delayed wound healing because he was diabetic. One patient (2%) from group A had recurrence of symptoms within about (6) months and that case had responded to conservative treatment using non-steroidal anti-inflammatory drugs and local injection of steroids as shown in table [1,2,3].

Table (1): Gender distribution of the cases.

Gender	No. of cases	Percentage
Female	46	95.8
Male	2	4.2

Table (2): Clinical improvement of the patients.

Level of improvement	Group A	Group B
Totally improved	23	24
Improved with some residual symptoms	1	0

Table (3): Postoperative complications.

Complaint	Group A	Group B
Superficial wound infection	1	1
Delayed wound healing	1	0
Scar tenderness	0	1
Recurrence with response to conservative treatment	1	0

Discussion

Open carpal tunnel decompression found to be very effective as all the patients got a satisfactory relief of their complaints postoperatively with a recurrence rate of about (2%)and this may be due to long standing compression resulting in a refractory ischemic changes in the median nerve. The same rate of recurrence was reported by Langloh and Linscheid which was (1.7%) following primary open surgical release [5]. The decompression was easily and satisfactorily achieved under local anesthesia which is found appropriate to most of the of patients including the elderly with variable medical diseases e.g. diabetes mellitus , heart diseases, and hypertension which make them unfit for general anesthesia .

Many authors have referred to the use of nerve manipulation,especially epineurotomyin combination with the release of the carpal tunnel to improve the outcome of the decompression .Duncan et al found (79 %) of the American society for surgery of the hand did a linear epineurotomy through the constricting band of the median nerve [7].Foulkeset al performed a prospective study of (36) wrist that had been randomized to operative treatment of carpal tunnel syndrome with or without an epineurotomy they concluded from their study that the addition of epineurotomy is safe but of no clinical benefit [8]. Actaneurochr in his study found no significant difference between those patients submitted to ligament release only and those submitted to ligament release andepineurotomy[9].

In the study results of treatment of severe carpal tunnel syndrome without internal neurolysisof the median nerve) by Gelberman who found no significant difference between the results in his study and those in previously reported similar groups of patients treated by release of carpal ligament with internal neurolysis of the median nerve [10].Robert and Salter they found that internal neurolysis is not needed for adequate nerve decompression or good results from surgery [11][12]. From this study and other relevant studies we recommend not to use internal neurolysis of the median nerve as a routine measure.

Conclusion: The routine median nerve neurolysis is not necessary as an additive procedure to the simple flexor retinaculum release and there is no significant difference in the outcome of flexor retinaculum release alone and that gained from retinaculum releasecombined with neurolysis of median

nerve in the surgical treatment of carpal tunnel syndrome.

References

[1] Andreu JL, Ly-Pen D. A randomized controlled trial of surgery vs steroid injection for carpal tunnel syndrome. Neurology. 2006;66(6):955-6.

[2] Chammas M. Carpal tunnel syndrome. Chirurgie de la main. 2014;33(2):75-94.

[3] Bormley GS minimal incision carpal tunnel decompression,J Hand surgery. 1994: 19A: 119-120.

[4] Wilson KM. Distal forearm regional block anesthesia for carpal tunnel release. J Hand surgery. 1997;22A: 31-33.

[5] Muller LP, Rudig L, Degreif J, Rommens PM. knee surgery sports traumatology Arthroscopy, Endoscopic carpal tunnel release: Results with special consideration to possible complications. 2000; 8: 166-172.

[6] Altissimi M. Mancini :GB surgical release of median nerve under local anesthesia for C.T.S .J. Hand surgery. 1988:13: 359-396.

[7] Larsen MB, Sorensen AI, Crone KL, Weis T, Boeckstyns ME. Carpal tunnel release: a randomized comparison of three surgical methods. J Hand Surg Eur. 2013; 38(6):646-50.

[8] Saw NL, Jones S, Shepstone L, Meyer M, Chapman PG, Logan AM. Early outcome and cost-effectiveness of endoscopic versus open carpal tunnel release: a randomized prospective trial. J Hand Surg. 2003; 28(5):444-9.

[9] Foulkes GD, Atkinson RE, Beuchle C, Doyle JR, Singer D. Outcome following epineurotomy in carpal tunnel syndrome. JH and Surgery.1994; 19A:539-547.

[10] Thoma A, Veltri K, Haines T, Duku E. A meta-analysis of randomized controlled trials comparing endoscopic and open carpal tunnel decompression. PlastReconstr Surg. 2004;114(5):1137-46.

[11] Phalen GS. J Bone joint surgery Am 1966: 15A:34-36.

[12] Louie DL, Earp BE, Collins JE, Losina E, Katz JN, Black EM et al. Outcomes of open carpal tunnel release at a minimum of ten years . J Bone Joint Surg Am 2013; 95: 1067.