ISSN 2347-3614

UNIQUE JOURNAL OF PHARMACEUTICAL AND BIOLOGICAL SCIENCES

Available online: www.ujconline.net

Research Article

OUR EXPERIENCE AND ANALYSIS OF THE RESULTS OF ENDOSCOPIC RELEASE FOR CARPAL TUNNEL SYNDROME IN KING FAHD HOSPITAL, JEDDAH, SAUDI ARABIA

Taha Samman*, Mohamed H Shaalan*, Adel Radi, Mohamed AlOtaibi, Mohamed Garout

Department of Orthopedics and Traumatology, King Fahad General Hospital, Jeddah, Kingdom of Saudi Arabia

Received 30-12-2015; Revised 28-01-2016; Accepted 26-02-2016

*Corresponding Author: **Taha Samman MD and Mohamed Shaalan MD**
Department of Orthopedics and Traumatology, King Fahad General Hospital, Jeddah, Kingdom of Saudi Arabia,
Email ids: t_samman@yahoo.com, shalan_6@yahoo.com

ABSTRACT

Background: The endoscopic carpal tunnel release became a very popular procedure because it is a minimally invasive procedure in comparison to the standard open technique, which thought to reduce the postoperative morbidity.
Objective: To review and evaluate the results of endoscopic carpal tunnel release in our 69 cases.
Design: Retrospective study.
Method: A sixty nine patients with confirmed diagnosis of carpal tunnel syndrome were released endoscopically and were followed up to six months postoperative period. We contacted patients by phone to evaluate their satisfaction by asking about: time of pain relief, time of return to daily activity, time of night pain relief, and time of numbness relief postoperatively.
Results: Among those who reported their satisfaction status, 93% were satisfied about the operation, whereas only 7% were dissatisfied. We have noticed no effect of duration of symptoms on the outcome of the procedure i.e. satisfaction status of the patients postoperatively (p-value was 0.941).
Conclusion: Endoscopic Carpal Tunnel release is an effective method with less co-morbidity, no scar problems, early recovery, early return to work and good outcome.
Keywords: Endoscopic, Carpal, Tunnel, Release, Retinaculum, Median, Nerve.

INTRODUCTION

The carpal tunnel is a non-extendible osteofibrous tunnel defined as the space located between the flexor retinaculum, which forms the roof, and the carpal sulcus, which forms the base. It is delimited on the ulnar edge by the hamate hook, pyramidal bone and pisiform bone, and on the radial edge by the scaphoid bone, trapezoid bone and tendon of the flexor carpi radialis (FCR) muscle. The base is formed by the capsule, and the anterior radiocarpal ligaments cover the underlying portions of the scaphoid, lunate, capitate, hamate, trapezium and trapezoid[1].

Carpal tunnel syndrome (CTS), with unclear etiology, is the most common entrapment neuropathy. Its occurrence is related to lots of medical and non-medical conditions with uncertain causality. Rheumatoid arthritis was found to be the most significant co morbidity associated with CTS, followed by gout, hypertension, diabetes, obesity, uremia, and acromegaly. For younger group age ≤39, the association of these co morbidities was stronger, and hypothyroidism and vitamin B6 deficiency were additional co morbidities. Aging appears to reduce the relative impact of the diseases commonly associated with CTS as the possible risk factors[2].

The estimated prevalence of CTS among the population is between 4% and 5%, particularly affecting individuals between40 and 60 years of age.[3] There were two peak frequencies: the first and higher of them between 45 and 59 years of age (75% female); and the second between 75 and 84 years (64%female)[3].

From a physiopathological point of view, compressive syndromes combine the phenomena of compression and tension. Anatomically, there are two sites of median nerve compression: one at the level of the proximal limit of the carpal tunnel, caused by wrist flexion because of changes in thickness and stiffness of the forearm fascia and in the proximal portion of the flexor retinaculum; and the second at the level of the narrowest portion, close to the hamate hook[4].

Nerve compression and traction may sequentially create problems relating to intraneural blood microcirculation,

lesions at the level of the myelin sheath and at axonal level, and changes to the supporting connective tissue.

Lundborg proposed the following clinical–anatomical classification: *Early stage*: Initial, characterized by intermittent symptoms that only occur at night. In idiopathic CTS, many factors can originate increased nocturnal intratunnel pressure. *Intermediary stage:* The symptoms are both nocturnal and diurnal. Abnormalities of the microcirculation are constantly present, with epineural and intrafascicular interstitial edema, which causes increased endoneurial fluid pressure. This interstitial edema causes absence of cell flow and thickening of the connective envelope, notably in relation to the epineurium. Destruction of the myelin sheath and nodes of Ranvier also occurs, based on saltatory conduction of inflows to the surface of the myelinated nerve fibers. After the compression has been relieved, rapid improvement of the symptoms occurs through reestablishment of the intraneural microcirculation. *Advanced stage* – Symptoms are constantly present, especially signs of sensory or motor deficit, translated as disruption of a greater or lesser number of axons (axonotmesis). Wallerian degeneration exists at the level of the disrupted axons. The connective envelopes form the site for reactive fibrous thickening. After release of the nerve, the recovery depends on nerve regeneration, which takes several months and maybe incomplete[5].

Open carpal tunnel release has been the gold standard in the operative treatment for Carpal Tunnel Syndrome. Open release has shown excellent results in terms of relief of carpal tunnel syndrome but has increased incidence of tenderness, pain and increased thickness at scar site[6].

Endoscopic release is a relatively new technique. Development of this technique was to overcome the problems of scar healing seen in the open technique due to cutting of the palmar fascia. Previous studies have shown a reduced incidence of scar tenderness and early return to work[7].

The aim of this study is to evaluate the results of endoscopic carpal tunnel release, in the form of early return to work, postoperative scar pain and relief of pain and numbness

Patients and Methods:

Sixty-nine patients with the diagnosis of carpal tunnel syndrome attending the surgeon clinic between January 2006 and January 2010 were included in our study. The patient's age ranged from 26- 79 with the mean 53.7. Females were more common 51 patients (three bilateral) 80% and males 13 patients (one bilateral) 20% with a ratio 4-1. Right side to left side ratio 1.35-1, with bilaterality 4 patients. The patients were informed about the study protocol and their consent to participate in this prospective clinical follow-up study were obtained.

Surgical technique:

All the cases were performed by one surgeon according to the Chow technique with a dual-portal set.

Outcome assessments:

Postoperatively, a routine follow-up evaluation was performed one week after surgery for suture removal. Moreover, a follow-up phone contact approach was also performed during the period of one month, two months, three months, and six months postoperatively where patients were asked about their feedback of different outcomes listed below:

1. Postoperative pain relief.
2. Postoperative numbness relief.
3. Postoperative night pain relief.
4. Time of return to work or normal daily activities.
5. Postoperative satisfaction.

RESULTS

This study was conducted on 65 patients with four patients with bilateral carpal tunnel syndrome of moderate to severe degree according to nerve conduction study and the presenting symptoms and signs.

All patients included in the study had their carpal tunnel syndrome released through endoscopic approach. However, around 81% received local anesthesia whereas only 9% and 10% of the patients preferred bier's block and general anesthesia approach, respectively (Table 1).

Table 1: Distribution of study population by type of anesthesia

Type of anesthesia	Total Number	%
Bier's block	6	8.70
Local anesthesia	56	81.16
General anesthesia	7	10.14
Total	69	100

In our series of patients, 58% had history of associated comorbid diseases. Diabetes mellitus (DM) was the most commonly reported comorbid disease (55%) followed by hypertension (HTN) (32%) and chronic renal failure (CRF) (12.5%), respectively.

Postoperative complications namely: ulnar neuropathy, heamtoma and wound infection were noticed only in three cases in our series, whereas 96% of the cases had no postoperative complications (Table 2).

Table 2: Percent distribution of complications reported postoperatively

Complications	Total number	%
No complications	66	95.65
Ulnar Neuropathy	1	1.45
Heamatoma	1	1.45
Wound infection	1	1.45
Total	69	100

The patients were followed up one week, one month, three months and six months postoperatively, then every patient was asked to tell us about his/her satisfaction/dissatisfaction about the results of his/her operation.

Around 57% of our patients had their pain relieved within one month postoperatively. Only one patient still with no pain improvement.

Most of the patients returned to their normal activities within three months except for three patients who still have pain and not satisfied (Table 3).

For numbness relieve postoperatively, around 20% of the patients had their numbness relieved immediately postoperatively and 38% of the patients reported relieve of numbness within one month postoperatively. On the other hand about 10% reported no improvement of their numbness status postoperatively (Table 4).

Table 3: Postoperative results of return to normal daily activities among study population

Return to normal daily activities	Total number	%
Still	6	8.70
Immediate	1	1.45
Within 1 month	38	55.07
Within 2 months	8	11.59
Within 3 months	3	4.35
Within 4 months	2	2.90
Missed	11	15.94
Total	69	100

Table 4: Postoperative numbness relieve response among study population

Numbness relief	Total number	%
Within 1 month	27	39.13
Within 2 months	6	8.70
Within 3 months	2	2.90
Within 6 months	1	1.45
Better	1	1.45
Immediate	14	20.29
Still	7	10.14
Missed	11	17.39
Total	69	100

DISCUSSION

Carpal tunnel syndrome is a condition of middle-aged individuals and affects females more often than males. In a surveillance Gelfman R et al where the adjusted incidence of carpal tunnel syndrome among females was much greater in than that among males (491 per 100,000 person-years for females and 258 per 100,000 person-years for males, ($p<$ 0.0001). The women-to-men ratio of CTS cases was 2.2:1, and of comparably adjusted incidence rates, was 1.9:1[8].In our small-size study population, we observed that female patients constituted 79.71% with female to male ratio of 4:1. Moreover, the majority of the patients included in our study were within middle age group with an age average of 53.7 years, a comparable finding to other studies[8].

Regarding postoperative pain relief or improvement as compared to preoperative status, Vasiliadis HS and colleagues observed significant postoperative pain improvement starting from second day, first week and second week of the operation among endoscopic release group as compared to the open release group[9].

On investigating the time required to return to normal daily activities, around 55% of our patients managed to resume their normal daily activities within one month postoperatively. Another 12%, 4% and 3% of the patients managed to do so within two month, three month and four month, respectively. Similar findings were also reported by other authors[10,11].

Around 61% of our patients reported night pain preoperatively, among them; around 29% reported immediate night pain relief postoperatively, whereas 48% required one month for their night pain to be resolved completely. On the hand, four patients (10%) reported no improvement of night pain postoperatively.

Furthermore, 83% of our patients had numbness preoperatively, where 20% reported immediate and complete relief and 40% reported complete numbness relief after one month postoperatively.

CONCLUSION

Carpal tunnel syndrome is relatively common disorder and disabling condition, it is common among females and manual workers, postoperative satisfaction is high and patient return to his normal activity.

The endoscopic release of carpal tunnel syndrome is relatively a new approach practiced in Saudi Arabia. As the immediate results were technically satisfactory, and no major complications were observed. Although the number of patients studied is not large, and may not adequately reflect the actual rate of occurrence of possible complications this technique is eligible for use in a larger number of patients, to evaluate its clinical results at long term and routine use basis, with continuous outcome survey.

REFERENCES

1. Chammas M, Boretto J, Burmann LM et al. Carpal tunnel syndrome–Part I (anatomy, physiology, etiology and diagnosis). Rev Bras Ortop, 2014; 49(5): 429–436
2. Tseng CH, Liao CC, Kuo CM, et al Medical and non-medical correlates of carpal tunnel syndrome in a Taiwan cohort of one million. Eur J Neurol. 2012; 19(1): 91-7.
3. Atroshi I, Gummesson C, Johnsson R, Ornstein E, Ranstam J,Rosén I. Prevalence of carpal tunnel syndrome in a general population. JAMA. 1999; 282(2): 153–8.
4. Doyle JR, Botte MJ. Surgical anatomy of the hand and upper extremity. Philadelphia: Lippincott, Williams & Wilkins; 2003.
5. Lundborg G. Nerve injury and repair. London: Churchill Livingstone; 1988.
6. Okutsu I, Ninomiya S; Hamanaka I, Kuroshima N.; and Inanami, H.: Measurement of pressure in the carpal canal before and after endoscopic management of carpal tunnel syndrome. J. Bone and Joint Surg., 71-A: 679- 683, June 1989.
7. Senan V, Balagopal K, Sucheendran J, et al Endoscopic vs. Open Carpal Tunnel Release. Kerala Journal of Orthopaedics 2012;25:14-20
8. Gelfman R, Melton L J, Yawn B P, Wollan P C, Amadio P C, Stevens J C: Long-term trends in carpal tunnel syndrome. Neurology 6; 72(1): 33–41, 2009.

9. Vasiliadis HS, Xenakis TA, Mitsionis G, Paschos N, Georgoulis A: Endoscopic versus open carpal tunnel release. Arthroscopy 26: 26-33, 2010.
10. Schmelzer RE, Della Rocca GJ, Caplin DA: Endoscopic carpal tunnel release: A review of 753 cases in 486 patients. Plast Reconstr Surg, 2006; 117: 177-185.
11. Oertel J, Schroeder HSW, Gaab MR: Dual-portal endoscopic release of the transverse ligament in carpal tunnel syndrome: Results of 411 procedures with special reference to technique, efficacy, and complications. Neurosurgery, 2006; 59: 333-340.

Source of support: Nil, Conflict of interest: None Declared