

Short communication

Outcomes of Open Carpal Tunnel Decompression via Mini-Palm Incision: A Prospective Case Series from Misrata Medical Center, Libya

Yousef Altaweel^{1,2} , Mohamed Eldanfou^{1,2} , Osama Rafieda^{1,2} ¹Department of Surgery, Faculty of Medicine, Misurata University, Misrata, Libya.²Department of Orthopedic Surgery, Misrata Medical Center, Misrata, Libya.Email: YousefAltaweel41@gmail.com

Abstract

Carpal tunnel syndrome (CTS) is the most common peripheral entrapment neuropathy worldwide, and open surgical decompression via a mini-palm incision has gained wide acceptance as an effective treatment for moderate-to-severe CTS. This study aimed to evaluate the short-term surgical outcomes, complications, and patient satisfaction following open carpal tunnel decompression via mini-palm incision at Misrata Medical Center, Libya. A prospective cross-sectional study was conducted at Misrata Medical Center during 2018. Fifty-five patients underwent open carpal tunnel decompression via mini-palm incision; 51 patients who completed follow-up at 2 weeks and 3 months were included, and outcomes were assessed in terms of wound complications, surgical adequacy, and patient satisfaction at 3 months postoperatively. The study population was predominantly female (98.04%) with a mean age of 47.96 years. Complications occurred in 3 cases (5.88%): one incomplete decompression requiring revision surgery, and two superficial wound infections in diabetic patients, both managed conservatively. Forty-eight cases (94.12%) were complication-free, and no nerve injury, deep wound infection, wound dehiscence, vascular injury, or complex regional pain syndrome was recorded. At 3 months, 49 patients (96.08%) reported being satisfied with surgical outcomes and 2 (3.92%) were fairly satisfied. Open surgical decompression via mini-palm incision is a safe, effective, and technically accessible procedure for the treatment of moderate-to-severe CTS, yielding excellent short-term outcomes and very high patient satisfaction. Diabetic patients require heightened postoperative wound surveillance.

Keywords. Carpal Tunnel Syndrome, Surgical Decompression, Mini-Palm Incision, Patient Satisfaction, Libya.

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Introduction

Carpal tunnel syndrome (CTS) is defined as the clinical disorder resulting from compression of the median nerve within the carpal tunnel at the wrist. First described by Sir James Paget in 1854 and later named by Moersch, CTS is the most common peripheral entrapment neuropathy encountered in clinical practice [1]. The condition predominantly affects individuals aged 30 to 60 years, with a marked female predominance. Established risk factors include female sex, obesity, diabetes mellitus, cigarette smoking, and occupational exposure to vibration and repetitive wrist movements. The cardinal symptoms include numbness, paraesthesia, and pain in the lateral three and a half fingers, frequently nocturnal and capable of awakening the patient from sleep [1].

Conservative management — including non-steroidal anti-inflammatory drugs (NSAIDs), night splints, vitamin B-complex supplementation, physical therapy, and local corticosteroid injections — is generally appropriate for mild CTS. However, patients with moderate or severe disease are better served by early surgical release [2]. The mini-palm incision technique, utilizing a limited palmar incision distal to the wrist flexion crease, offers reliable decompression of the transverse carpal ligament (TCL) with minimal soft tissue disruption and rapid recovery [3].

Despite the global prevalence of CTS, published data from Libya and the North African region remain sparse. This study reports the short-term surgical outcomes, complication profile, and patient satisfaction following open carpal tunnel decompression via mini-palm incision at Misrata Medical Center, contributing to the regional evidence base for this common surgical condition.

Methods

Study Design and Setting

A prospective cross-sectional study was conducted at Misrata Medical Center, Misrata, Libya, between 1st January 2018 and 31st December 2018.

Participants

All patients who underwent open carpal tunnel decompression via mini-palm incision during the study period were eligible for inclusion. Of 55 patients operated during this period, 51 were included in the final analysis, having completed follow-up at 2 weeks and 3 months postoperatively. Four patients were excluded due to loss to follow-up.

Surgical Technique

Most of the procedures were performed under regional Bier block anesthesia (47 cases, 92.16%), while local anesthesia (1 case, 1.96%), and general anesthesia were used following a failed regional block (3 cases, 5.88%). The mini-palm incision was placed just distal to the distal wrist flexion crease, slightly ulnar to the midline, and extended 3 cm distally in line with the third web space. After retraction of palmar fascia fibers and hypothenar fat, the TCL and distal 2 cm of antebrachial fascia were divided under direct vision using Metzenbaum scissors [4,5]. External neurolysis of the median nerve was performed when indicated. The wound was closed and a compressive dressing applied.

Outcome Assessment

Outcomes were assessed at 2 weeks and 3 months postoperatively. The primary outcomes were: surgical adequacy (intraoperative findings), wound complications (infection, dehiscence, haematoma), and patient-reported satisfaction at 3 months (satisfied, fairly satisfied, or dissatisfied).

Results

Demographic Characteristics

The study cohort included 51 patients: 50 females (98.04%) and 1 male (1.96%). The mean age was 47.96 years (range: 24–73 years), with 64% of patients aged between 41 and 60 years. Among female patients, 25 (49.02%) were housewives, 21 (41.18%) were employed, and 4 (7.84%) identified as non-working. The male patient worked in construction, as shown in (Table 1).

Table 1. Demographic characteristics of the study population (N=51).

Characteristic	N	%
Sex — Female	50	98.04
Sex — Male	1	1.96
Age 24–40 years	~18	~36.0
Age 41–60 years	~33	~64.0
Diabetic	10	19.61
No chronic illness	41	80.39

Laterality

The right side was involved in 21 patients (41.18%), the left in 9 (17.64%), and bilateral in 21 (41.18%). Among bilateral cases, 12 (57.14%) elected to operate on the right side first and 9 (42.86%) on the left. The operated side was right in 33 cases (64.71%) and left in 18 (35.29%).

Pre-operative Conservative Management

Prior to surgical decision, NSAIDs had been used by 46 patients (90.20%), vitamin B-complex by 44 (86.27%), night splints by 36 (70.59%), and physiotherapy by 11 (21.57%), reflecting the moderate-to-severe disease profile of the cohort.

Complications

Surgical complications were observed in 3 cases (5.88%): one case of incomplete decompression identified at revision surgery (1.96%), and two cases of superficial wound infection occurring at 6 and 8 days postoperatively in diabetic female patients aged 46 and 57 years, respectively (3.92%), both treated successfully with oral antibiotics. A total of 48 cases (94.12%) were complication-free. No cases of deep wound infection, nerve or vascular injury, wound dehiscence, scar contracture, or complex regional pain syndrome were recorded, as shown in (Table 2).

Table 2. Postoperative complications (N=51).

Complication	N	%
Incomplete decompression (revision surgery)	1	1.96
Superficial wound infection	2	3.92
No complication	48	94.12
Nerve/vascular injury, CRPS, dehiscence	0	0.0

Patient Satisfaction at 3 Months

At the 3-month follow-up, 49 patients (96.08%) reported being satisfied with their surgical outcome, and 2 patients (3.92%) described themselves as fairly satisfied. No patient was dissatisfied.

Discussion

The present study confirms that open carpal tunnel decompression via mini-palm incision is associated with high surgical success and very high patient satisfaction in Libya. The female predominance (98.04%) and mean age (47.96 years) observed in this cohort are consistent with the established epidemiological profile of CTS, though the female proportion in this study is somewhat higher than that reported in international series. Rahman et al. reported 91.1% female patients with a mean age of 41.8 years [6], Khan et al. reported 81% [2], and Pradhan et al. reported 87.5% with a mean age of 39 years [3]. The relatively older mean age in the present cohort may reflect delayed presentation, a characteristic of resource-limited settings where patients attempt extended conservative management before seeking surgical consultation.

The overall complication rate of 5.88% compares favorably with published international series. Khan et al. reported residual pain in 6% of patients at 3 months [2], while Rahman et al. documented superficial wound infection in only 2 of 382 cases [6]. The two wound infections in the present series both occurred in diabetic patients, consistent with the recognized association between diabetes and impaired wound healing [7]. This finding underscores the importance of enhanced postoperative surveillance and patient education in diabetic individuals undergoing carpal tunnel decompression.

The patient satisfaction rate of 96.08% at 3 months is comparable to the highest reported in the international literature, reflecting the technical reliability of the mini-palm approach. The absence of major complications — including nerve injury, vascular injury, complex regional pain syndrome, wound dehiscence, and deep infection — further supports the safety of this technique.

A limitation of this study is the relatively small sample size and the single-center design, which may limit generalizability. Loss to follow-up of 4 cases (7.3%) may also be another limitation. Longer-term follow-up beyond 3 months would further strengthen the evidence base for this technique.

Conclusion

Open carpal tunnel decompression via mini-palm incision is a safe, effective, and technically reproducible surgical procedure for moderate-to-severe CTS, yielding a complication rate of 5.88% with patient satisfaction of 96.08% at 3 months. Diabetic patients represent a higher-risk subgroup requiring enhanced wound management. These findings support the adoption of this technique as the standard surgical approach for CTS in the Libyan surgical context.

Conflict of interest. Nil

References

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