

ORIGINAL ARTICLE

How can we Minimise Pain During and After Carpal Tunnel Decompression?

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ABSTRACT

Objective: Our Study objective was to assess pain severity in a series of patients who underwent carpal tunnel release (CTR) surgery with a technique that minimise tourniquet inflation time.**Material and Method:** Our study represented a prospective case series conducted from June 2021 to Dec 2021 in Islam Medical College Sialkot and CMH Lahore. A total of 160 patients with a clinical diagnosis and positive EMG/NCS were included. The patients were asked to complete a proforma which assesses pain on basis of Visual Analogue Scale (VAS) at 3 occasions; (1) at initial out patient appointment (2) in post operative area after surgery (3) at 12 weeks post CTR surgery. Questions were asked to assess pain severity at surgery site and over area of tourniquet inflation.**Results:** 160 patients were included in our study with a median age of 50years (range 33-65). There were 110 females and 50 males (ratio 2.2:1). The average tourniquet time was 8 minutes (range 6-9.5). 91.8% (n-147) of our patients had a VAS of 1 at both the wound and tourniquet site post-operatively. 5% had a score of 3 and 4.2 had a VAS score of 4 (n-8 and n-5 respectively).

27 were operated in past for contralateral CTD as well and remaining 133 patients said they would prefer to be operated for other side by similar method.

Conclusion: Our technique is safe and effective in reducing pain post CTR surgery.

INTRODUCTION

The commonest compressive neuropathy in upper limbs is carpal tunnel syndrome (CTS). Its approximate general population prevalence is 1% to 5%.^{1,2} CTS is a common reason of pain, numbness, and tingling in hands. Various factors and conditions pose increased risk for CTS including occupational biomechanical factors and occupational activities requiring a high degree of repetition and force.³ Positive family history and a medical history of diabetes mellitus, hypothyroidism, rheumatoid arthritis or obesity and pregnancy are potential predisposing factors.⁴

CTS causes disability, low productivity, lost wages and absenteeism from work. An estimated annual cost of medical care of carpal tunnel syndrome in the United States cost more than \$2 billion.⁵ CTR surgery using techniques of local anaesthetic infiltration can be employed with good outcomes.⁶

There are various techniques for CTR surgery; it can be performed with or without general anaesthesia using other anaesthetic techniques. Tourniquet application is also an area of controversy.⁷ Studies have shown that usage of local anaesthesia is a safe, cost-effective method and is usually well tolerated by most patients, but tourniquet discomfort is a downside in wide-awake patients.^{8,9} Various techniques have been discussed to control pain with their pros & cons, regional anaesthesia and brachial plexus block are also employed.^{10,11}

Literature suggests that tourniquet in upper limbs start causing discomfort after 18 minutes of inflation, while this is adequate time to complete most CTDs.¹² Patients often complain that tourniquet pressure is the most uncomfortable part of the procedure. Tourniquet application is not risk free, it may cause local and systemic adverse effects; many patients do experience pain and discomfort at site of tourniquet after surgery which might be annoying in many cases.¹³

Our study objective was to present results of our patients who underwent carpal tunnel release (CTR) surgery with a technique that minimise tourniquet inflation time with resultant reduction in postoperative pain.

MATERIALS AND METHODS

This study was conducted from June 2021 to Dec 2021 in Islam Medical College Sialkot and CMH Lahore. Informed and written

consent was obtained from each patient. A total of 160 patients with a clinical diagnosis and positive EMG/NCS results were included in the study.

A questionnaire was designed to assess pain severity based on a pain score on visual scale (1-10). Pain at tourniquet and wound site was assessed. Patients filled proforma preoperative in clinic, postoperatively in Recovery and follow up visit at 3 months.

CTD was carried out as a day case procedure. All operations were performed under local anaesthesia. In operation theatre patient hand was placed on side table. Tourniquet was applied at start of procedure but was inflated at a later stage. Local anaesthetic (10 ml of 2% lignocaine and 10 ml of 0.5% bupivacaine) was injected at surgical site and into the carpal tunnel. Once fully prepped and draped, arm was elevated and tourniquet pressure was set 100 mmHg above the patient's systolic blood pressure. CTD was carried out in standard manner.

Immediately after release of carpal tunnel, tourniquet was deflated and haemostasis was secured using diathermy, and wound was stitched using 3-0 prolene. Dressing was applied and hand was protected with wool and crepe, sling was given for comfort. Sutures were removed at 2 weeks and patient reviewed at 3 month and 1 year.

RESULTS

160 patients were included in our study with a median age of 50years (range 33-65). There were 110 females and 50 males (ratio 2.2:1). Right side was operated in 89 and left in 71 patients. Right hand dominance was found in 135 against a left-hand dominance in 25 patients. The average tourniquet time was 8 minutes (range 6-9.5). 91.8% (n-147) of our patients had a VAS of 1 at both the wound and tourniquet site post-operatively. 5% had a score of 3 and 4.2 had a VAS score of 4 (n-8 and n-5 respectively).

27 of our patients had already CTD for contralateral side and remaining 133 patients said they would prefer to be operated for other side in same way.

DISCUSSION

Tourniquets are commonly used in hand surgery to provide a clean operative field. A study interviewing surgeons registered with

American Society of Surgery of the Hand showed that 95% of surgeons use a tourniquet for CTD.¹⁴

Tourniquets are reported to cause significant discomfort by direct mechanical pressure with resultant tissue anoxia. Its application can also lead to injury to soft tissue envelope or neurovascular structures in rare cases.^{15,16}

CTD is an excellent procedure with high patient satisfaction post operatively.¹⁷ Most of the patients are mainly concerned about relief from pain and to what extent and how sooner, they will be able to resume normal activities.^{18,19,20} There is continuous effort to improve pain relief intra operatively and post operatively in patients undergoing CTD. A study conducted by Ghani et al in 2019 showed a pain score of 1 on VAS in 98% patients of their series.²¹

In our study 91.8% patients showed a score of 1, though our results were not as good as Ghani et al, their sample size was limited to 55 patients compared to 160 patients in our series,

Tourniquet time can be reduced by appropriately adjusting tourniquet application and usage, average time in our study was 8 minutes which is higher than Ghani et al series, they had an average tourniquet time of 5.5 minutes. Our tourniquet time is less as compared to average time mentioned in most of the series which is 9.5 minutes.²²

There was no wound infection, stiffness or other significant long-term complications at one year follow up in our series.

CONCLUSION

We concluded that CTD using local anaesthetic with application of tourniquet is a safe procedure and by carefully timing tourniquet inflation and deflation, excellent results in term of intra and post operative pain relief can be achieved.

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