

# Modified Altissimi and Mancini technique for carpal tunnel decompression

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## Abstract

**Introduction:** Carpal tunnel syndrome is the commonest compressive peripheral nerve neuropathy; open carpal tunnel decompression still remains the preferred method as a day case procedure using local anaesthesia. The local anaesthetic is commonly administered by subcutaneous infiltration alone (the Gale technique) or by infiltration of the local anaesthetic into the carpal tunnel in addition to the subcutaneous infiltration (the Altissimi and Mancini technique). The purpose of this study was to evaluate the efficacy of the modified Altissimi and Mancini technique of local anaesthesia.

**Methods:** Fourteen hands of twelve patients age ranged from 26 to 55 years, two patients with bilateral involvements were recruited. Most involved hand was operated first with the modified Altissimi and Mancini technique of local anaesthesia.

**Results:** Intra-operative pain was evaluated using visual analog score. Patients experienced no to very little intra-operative pain VAS 0- 2. Only one patient experienced tourniquet discomfort which subsided after release. There was neither any intra-operative nor during follow up, the signs of iatrogenic median nerve injury.

**Conclusion:** We concluded that open carpal tunnel decompression using modified Altissimi and Mancini technique under local anaesthesia and with tourniquet control is a safe, effective and acceptable novel technique.

## Introduction

Carpal tunnel syndrome was first described by Sir James Paget in 1854 and is the most common peripheral nerve compressive neuropathy. It involves compression of the median nerve in the carpal tunnel at the wrist<sup>1</sup>. First carpal tunnel release was reportedly performed by Herbert Galloway in 1924<sup>2</sup>. With the relatively high incidence of anomalies of the median nerve and the ulnar neurovascular structures, in the vicinity of the transverse carpal ligament, open carpal tunnel release remains the preferred method of many surgeons for decompression of the median nerve at the wrist. This technique affords full inspection of the transverse carpal ligament and the contents of the carpal canal. Carpal tunnel decompression is commonly performed under local anaesthesia as a day case procedure

in most orthopaedic, plastic and hand centres. The advantage of using local anaesthesia for these operations is that it allows for a rapid turnover of patients and avoids the complications of regional and general anaesthesia<sup>3</sup>. Altissimi and Mancini (1988) suggested that the local anaesthetic should be infiltrated into the carpal tunnel in addition to subcutaneously<sup>3,5</sup>. They accepted that there is a chance of injury to the median nerve with this technique. Gale (1991) suggested that superficial infiltration of the local anaesthetic provides adequate anaesthesia in most cases<sup>3,6</sup>. Kay and Marshall (1992) described a safe and reliable technique of injecting carpal tunnel which they did for 10 yrs and found no cases of median nerve injury<sup>4</sup>. The aim of our study was to evaluate the efficacy of the Altissimi and Mancini technique of local anaesthesia.

**Methods**

This was a non-randomized, prospective interventional trial. Patients with carpal tunnel syndrome, diagnosed with clinical tests and nerve conduction study were identified. Every patient was informed about the study and nature of procedure and those agreeing to undergo study were enrolled. A total of 12 patients were recruited, 2 patients had bilateral involvement, in total 14 hands. Our principal outcome measure was to calculate the intra-operative pain using visual analog score(VAS) to measure intra-operative pain with 0 being no pain at all and 10 being maximum pain. The more symptomatic side was operated upon first; following 4 to 8 weeks later second side was operated. Local anaesthesia was administered to all patients by the operating surgeon using the following technique (The modified Altissimi and Mancini technique): 3.5 ml of 2% lignocaine was infiltrated along the line of the incision. Then, 2.5 ml of 2% lignocaine was infiltrated into the carpal tunnel using the technique described by Kay and Marshall (1992) to inject into the carpal tunnel. The needle was inserted just distal to the distal wrist crease in line with the ring finger ray and then advanced radially at a 45 degree angle until its tip was in one of the finger flexors, which was confirmed by moving the fingers. The tip was then withdrawn slightly and the local anaesthetic injected. The operations were carried out under forearm tourniquet control as day case procedures. The effect of the local anaesthetic was confirmed before making the incision. All the steps in the operation, including the size of the incision and the instruments used, were standardized. The incision was straight, 5 cm long and did not extend into the forearm. The transverse carpal ligament was divided under direct vision using a no.15 blade. The median nerve was inspected for any signs of needle injury. The tourniquet was released and haemostasis achieved before wound closure. The skin was sutured with 3-0 nylon. All patients were reviewed 3 and 10 days after surgery for suture removal and median nerve function was clinically assessed on each follow up. Patients with bilateral symptoms were also asked whether they wanted to undergo surgery with same anaesthesia and second operation was done 4 to 8 weeks after the first operation.

**Results**

A total of 14 hands of 12 patients with two bilateral hands were operated with the modified Altissimi and Mancini technique of local anaesthesia. All the patients were females and age ranged from 26 to 55 years with mean age of 38 years. The intra-operative pain score was rated as 0 by 10 patients and 2 by 2 patients. Average operation time was 25-30 minutes, only one patient experienced

tourniquet discomfort after release which subsided after 10 – 15 minutes. There were no signs of needle injury to the median nerve in any of the operations. And none of the patients showed any signs of median nerve injury during follow up. The 2 patients with bilateral symptoms also agreed to undergo surgery with the same anaesthesia for the other side.



**Fig. 1:** A: Forearm Tourniquet B: Technique of injecting carpal tunnel.



C: Skin Incision D: Median nerve decompression after TCL release



**Fig. 2:** A: Forearm Tourniquet B: Technique of injecting carpal tunnel.



C: Skin Incision D: Median nerve decompression after TCL release

## Local anaesthesia for carpal tunnel decompression



Fig. 3: A: Forearm  
Tourniquet



B: Technique of injecting  
carpal tunnel.



C: Skin Incision



D: Median nerve decompression  
after TCL release

## Discussion

Carpal tunnel decompression is commonly performed as a day case procedure in most centers now days<sup>3</sup>. Performing this operation under local anaesthesia helps in expediting the patient turnover, limiting the costs and in reducing waiting lists. However, it does put additional responsibility upon the operating surgeon to ensure that the procedure causes minimal pain.

Altissimi and Mancini (1988) described a technique of infiltrating 4 to 5ml 2% Mepivacaine into the carpal tunnel in addition to 3 to 4 ml infiltration of the same anaesthetic into the subcutaneous tissue. They reported complete analgesia in most patients. However, they did caution about the risks of median nerve injury<sup>5</sup>.

Kay and Marshall (1992) described a safe and reliable technique of injecting the carpal tunnel which they used for over 10 years without injury to median nerve.<sup>4</sup> Gale (1991) suggested that local anaesthetic be only injected into the subcutaneous tissues to avoid median nerve injury<sup>6</sup>.

Baguneid et al. (1997) used a similar technique in 86 consecutive patients and noted that only 11 had slight discomfort, which was bearable, during surgery<sup>7</sup>. Gibson (1990) reported the use of 0.5% Bupivacaine with adrenaline with a similar technique and reported slight discomfort on incising the flexor retinaculum in 4 of the 98 patients<sup>8</sup>. In both of these studies, pain was not recorded using a validated scale.

S. Patil, M. Ramakrishnan and J. Stothard (2006) compared the Gale technique with the modified Altissimi and Mancini

technique in 20 patients with bilateral hands with different techniques in two hands and found no intra-operative pain (NRPS) with the modified Altissimi and Mancini technique. Six patients with Gale technique experienced pain while dividing flexor retinaculum. They hypothesized this due to median nerve block<sup>3</sup>.

In our study the patients experienced no to very little pain VAS 0- 2. This is probably due to median nerve block inside the carpal tunnel. We did not find any case of median nerve injury due to carpal tunnel infiltration. This may be due to safe technique of Kay and Marshall we used. Average operating time was 25- 30 minutes and there was only one case with tourniquet discomfort after release. So a forearm tourniquet can be used safely. The fact that patients with bilateral affection agreed to undergo surgery with the same technique reinforces the effectiveness of this novel technique of carpal tunnel decompression



Fig. 4: Photograph with bilateral hand involvement.

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