

Postoperative Discomfort due to Peripheral Residual Nerve Blocks in Outpatients who had Carpal Tunnel Surgery



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Submission: December 20, 2017; **Published:** May 30, 2017

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Abstract

Introduction: The purpose of this study was to compare the discomfort due to residual blocks between distal and proximal blocks.

Methods: The study was conducted on a pool of ambulatory patients who had undergone open surgery for carpal tunnel release under peripheral blocks. Patients returned home 2-3hours after surgery. On the third postoperative day. They were called, and asked to determine the discomfort caused by residual obstruction after discharge from the hospital, on a verbal scale (absent, minor, slight, very important and very important). According to the degree of discomfort, we separated the patients into two groups that were compared with Fisher exact tests and Student's t-test.

Results: Between November 2006 and January 2008, 185 patients were contacted on Day 3 and analyzed (105 distal BP and 80 proximal BP). The age, sex, body mass index, the dominant side and the operated side, smoking, postoperative pain scores did not differ between groups. The musculocutaneous nerve was blocked in 24 (22.9%) patients who had a distal peripheral nerve block (distal BP) and in 63 (78.8%) of those who have had a proximal block (proximal BP) ($p < 0.001$). Overall, the distal BP induced less discomfort than proximal BP ($P = 0.041$).

Discussion: This difference could be due to the larger territory of the proximal BP. But the clinical impact of this malaise seems limited since in both groups, 70 to 80% of patients reported no discomfort or minor discomfort.

Keywords: Peripheral blocks; Carpal tunnel syndrome; Postoperative discomfort; Surveillance; Monitoring

Summary

Introduction: The aim of our study was to assess the discomfort due to residual distal and proximal blocks in outpatients operated for carpal tunnel release.

Methods: The study was conducted on a cohort of ambulatory patients having undergone open surgery for carpal tunnel release in peripheral blocks. Patients went home 2-3hours after surgery. On the third postoperative day. They were called, and were asked to determine the discomfort caused by residual obstruction after discharge from the hospital on a verbal scale (absent, minor, slight, very important and very important). According to the degrees of discomfort, we separated the patients into two groups and compared the two using the Fisher exact test and Student's t-test.

Results: Between November 2006 and January 2008, 185 patients were contacted three days after their release and analyzed (105 distal PNBs and 80 proximal PNBs). Age, gender, body mass index, ASA score, postoperative pain scores were not different between groups. The musculocutaneous nerve was blocked in 23% of distal PNBs and in 81% of proximal ones ($p < 0.001$). Overall, distal PNBs induced less discomfort than proximal PNBs ($p = 0.041$). Nevertheless, 20% of patients with distal PNBs express mild to very important discomfort, versus 30% of patients with proximal PNBs ($p = 0.124$).

Discussion: Despite dramatic differences in anaesthetised and paralysed territories between the two groups, wrist PNBs induce only slightly less postoperative discomfort due to residual block than proximal PNBs. Therefore, the clinical impact of this discomfort seems limited since in both groups, 70 to 80% of patients reported no or minor discomfort.

Introduction

Hand Surgery and particularly carpal tunnel is very common [1]. Peripheral nerve blocks were the techniques anesthetics frequently used. They provide good surgical conditions and a better risk-benefit. Two types were first disclosed for this surgery. This would be the nerve block at the wrist [2] and nerve blocks at the brachial plexus or the humeral canal or axilla [3]. The choice of technique depends on the operators and indications but they are comparable to anesthesia level. The main nerves to block in carpal tunnel release surgery, are the median, ulnar and often the musculocutaneous. There is talk of proximal peripheral block (PPB) when the nerves are blocked at the axilla and distal peripheral block when they are located at the elbow and wrist.

Whatever the technique, blocks allow street aptitude before the total lift of the block [4]. Nearly all patients go home with the residual effects of anesthesia [5]. We did not find any similar study on the blocks at the wrist. In addition, the discomfort of residual blocks at the brachial channel have not been compared with those of the blocks at the wrist.

The aim of our study was to evaluate discomfort from distal and proximal residual blocks in ambulatory patients undergoing carpal tunnel release surgery.

Methods

Patients

The study was conducted in the outpatient surgery unit of a university hospital. This is a prospective observational study which was conducted from January 2007 to June 2008. It did not require application files to be submitted to the committee for the protection of local people because it does not create a change the usual care of patients. We have included all adult patients ASA 1-3 operated for carpal tunnel syndrome in outpatient under loco-regional anesthetic (LRA). Criteria for non-inclusion were: the refusal or inability to use simple digital scales.

Intraoperative support

Wrist and brachial canal blocks were then explained to patients after the agreement for intervention under LRA obtained during the pre-anesthetic consultation. There was no oral premedication but in the preanesthetic room, after standard monitoring, intravenous sedation (1mg midazolam and sufentanil 5mcg) plus oxygen therapy (6L /min) via a face mask was offered to patients before performing a LRA. Blocks were performed either via ultrasound or neuro stimulator with the same needle mark (Nanoline™, Pajunk™, Geisingen, Germany) 25mm for blocks wrist and 50mm for brachial canal blocks. Mepivacaine 1.5% (Carbocaine@AstraZeneca, Rueil-Malmaison, France) was used for all patients. The LRA technique to the wrist was that described by maicaire and for the brachial plexus blocks the Gaertner technique [6]. Before making the incision, the surgeon was tested the incision site with the tip of the scalpel or pinching the area with dissection forceps. When

necessary, they completed the LRA by intraoperative local infiltration of lidocaine 1%.

Post operative

During their stay in a post anesthesia care unit (PACU), one of six members of the paramedical team, which did not intervene in the prior management of the patient, asked them to self-assess pain experienced during the LRA (related to the injection, to electrical stimulation, injection of mepivacaine) at the withers and during surgery. Patients then returned to their room or were started on analgesics (paracetamol 1g×4/day and vitamin C-1g/j) (Afar). They were then invited to eat and then get up. They left home two hours after the end of the intervention.

Gathering information

Each subject was contacted by telephone 3days after hospital discharge in accordance with outpatient protocol. After the basic checks, the only additional check was «Having an anesthetized limb bothered you: very much, a lot, some, a little, not at all» (Likert)

Statistics

Quantitative values are given as mean and standard deviations and analyzed with a Student test. The distribution of scores for discomfort is not Gaussian, and for more clinical relevance, these scores from 0 to 10 were analyzed as a percentage of patients with a score greater than 3/10, to take into account only moderate to severe discomfort. The discomfort was assessed according to the anesthetic technique, age, history. Qualitative values are given in absolute numbers and as a percentage of the population studied. Statistics were performed using the PASW Statistics 18 (SPSS Inc., Chicago, IL) software. Values of $p < 0.05$ were considered significant.

Results

Between November 2006 and January 2008, 185 patients were included and analyzed at postoperative day 3- 105 BP distal and 80 BP proximal.

Board

The distribution of patients according to the type of anesthesia. Our population was divided into 134 women and 51 men. Age, sex, body mass index, the dominant side and the operated side, smoking and postoperative pain did not differ between groups. The average age was 55.85 ± 12.26 years in the wrist group and 57.08 ± 12.28 years in the proximal group. The weight, height and BMI were respectively 75.39 ± 18.18 kg; 164.33 ± 6.9 cm; 27.87 ± 6.21 kg/m² wrist and 71.15 ± 15.64 kg; 162.95 ± 9.17 cm; 26.76 ± 5.51 kg/m² proximally. The average doses of mepivacaine 1.5% to $17.86 \pm 23.14 \pm 3.24$ ml and 4.25 ml in each group.

The average duration of tourniquet was similar with 13.19 ± 3.01 mn for the wrist group and 12.96 ± 2.98 mn proximally. Table 1 summarizes the distribution of the population by type

of anesthesia. The peroneal nerve was significantly blocked proximally 63(78.8%) against 24(22.9%) P<0.0.001. Figure 2 & 1 showed that overall the LRA is well tolerated with 17(9.2%) of the genes greater than 3. The proximal blocks gene was significantly higher than the wrist blocks 4(3.9%) against 13(16.3%) p = 0.04?

Table 1: Age, sex, body mass index, the dominant side and the operated side, smoking and postoperative pain did not differ between groups. The habit of the surgeon and the musculocutaneous blockage have a protective effect but the addition of anesthesia is a risk factor.

Admission Examination	Total (N=185)	Wrist N=105	Proximal N=80	Or and Ci 95%
Gender				
Men	51 (27.6%)	29 (27.6%)	22 (27.5%)	RR:1.00 [0.76-1.33] p = 0.56
women	134 (72.4%)	76 (72.4%)	58 (72.5%)	
Arm Surgery				
Right	111 (60%)	65 (61.9%)	46 (57.5%)	RR:1.08 [0.83-1.41] p = 0.54
Left	74 (40%)	40 (38.1%)	34 (42.5%)	
Surgeon				
Accustomed	151 (81.6%)	79 (75.2%)	72 (90.0%)	RR:0.68 [0.54-0.87] p = 0.01
not accustomed	34 (18.4%)	26 (24.8%)	8 (10%)	
Blockage of the Musculo Cut				
It requests the Commission to develop adequate indicators for assessing the implementation of the Decent Work Agenda by the EU.	87 (47%)	24 (22.9%)	63 (78.8%)	RR:0.33 [0.23-0.47] P<0.0.001
No	98 (53%)	81 (77.1%)	17 (21.3%)	
Further AI				
yes	41 (22.2%)	29 (27.6%)	12 (15%)	RR:1.34 [1.04-1.72] p= 0.08
No	144 (77.8%)	76 (72.4%)	68 (85.1%)	
Dominant Side				
Right	167 (90.1%)	96 (91.4%)	71 (88.8%)	RR:1.15 [0.71-1.86]P= 0.72
Left	18 (9.9%)	9 (8.6%)	9 (11.2%)	
Active Smoking				
Tobacco	26 (14.3%)	16 (15.2%)	10 (12.5%)	RR:1.10 [0.79-1.53]P= 0.75
No	159 (85.7%)	89 (84.8%)	70 (87.5%)	
BMI>30m / kg2				
yes	48 (26%)	28 (26.7%)	20 (25%)	RR:1.04 [0.78-1.37]P= 0.80
No	137 (74%)	77 (73.3%)	58 (72%)	
Day 0-3 Post op pain				
yes	121 (65.6%)	71 (69.5%)	50 (62.5%)	RR :1.10 [0.84-1.45] P=0.47
No	64 (34.4%)	34 (30.5%)	30 (37.5%)	

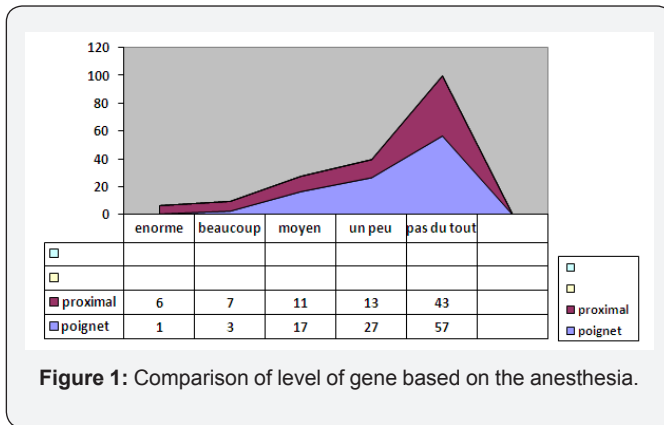


Figure 1: Comparison of level of gene based on the anesthesia.

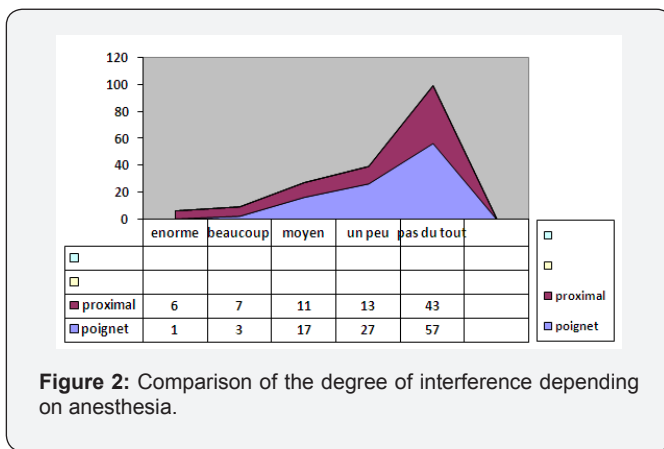


Figure 2: Comparison of the degree of interference depending on anesthesia.

Discussion

Wrist blocks induced less discomfort than brachial canal blocks. But overall incidence was lower at around 9%. The peroneal nerve was frequently blocked proximally. But this data is not reliable. It could be blocked because of its proximity to the radial wrist. It is extremely difficult to obtain reliable and consistent data on the incidence of postoperative discomfort due to the residual effects of the LRA. Retrospective studies estimated the incidence of discomfort to be 0.5-1.0%, but a prospective study suggests an incidence of 10-15%. In view of all studies, the existence of discomfort directly attributed to the nerve block in carpal tunnel surgery remains controversial and is all clearly dependent on the definition of discomfort [7].

As many risk factors may be considered in the occurrence of post operative discomfort. A study done in the US shows that the incidence of postoperative complications of peripheral nerve blocks was not modified by the use of ultrasonography [8]. Surgery could also cause discomfort. Uroš Ahčan [9] showed in a comparative study between the conventional technique and by macroscopic endoscopic visualization of the entire transverse carpal ligament a significant reduction in post operative discomfort after carpal tunnel surgery. This technique could avoid injuries subcutaneous palmar nerve terminal branch of

the musculocutaneous. He further asserts that there are several individual anatomical variations which are difficult to predict.

The density of skin nerve endings that criss-cross from the hand to the trunk further increases the risk of injury. Another explanation for the post-block discomfort is the etiology underlying several pathologies with nerve damage may favor the occurrence of post operative discomfort after LRA [10]. The most cited were tenosynovitis in rheumatoid arthritis, non-specific chronic tenosynovitis or fibrosis, radius fracture in the wrist, Colles' fracture, carpal arthrosis, scaphoid nonunion, the wrist trauma, diabetes mellitus, thyroid disease, pregnancy, birth control pills, lymph nodes, muscle hernia or lipomas in the carpal tunnel. Anesthesia consultation still does not diagnose preexisting nerve injuries. Even when the diagnosis is made, there is no direct correlation between the etiology and nerve damage.

Conclusion

Peripheral nerve blocks provide are significantly beneficial. But could increase the risk of discomfort after surgery in ambulatory patients. The density of skin nerve endings decreases from the hand to the trunk; the individual anatomical variability; the underlying pathologies make it difficult to complete exploration before surgery. Distal blocks are preferred, first direct visualization of nerves through ultrasound and prefer new surgical techniques is to be encouraged. Though a minor surgery, carpal tunnel can hide a nervous pathology that could compromise the contribution of the LRA. The postoperative day 3 postoperative gene could be a warning sign for a neurological follow up with the involvement of all participants.

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DOI: [10.19080/JAICM.2017.02.555597](https://doi.org/10.19080/JAICM.2017.02.555597)

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