

Postoperative Discomfort Due to Peripheral Residual Nerve Blocks in Outpatients Who had Carpal Tunnel Surgery

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Abstract

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 2-3 hours 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.

Keywords: Peripheral Blocks; Carpal Tunnel Syndrome; Postoperative Discomfort; Monitoring

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 [1].

The main nerves to block in carpal tunnel release surgery are the median, ulnar and often the musculocutaneous [1]. 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 has 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 (1 mg midazolam and sufentanil 5 mcg) plus oxygen therapy (6 L / min) via a face mask was offered to patients before performing a LRA. Blocks were performed either via ultrasound or neurostimulator with the same needle mark (Nanoline™, Pajunk™, Geisingen, Germany) 25 mm for blocks wrist and 50 mm 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 [2] 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 1 g × 4 / day and vitamin C 1 g/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 3 days 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.

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%) $P < 0.0001$. Figure 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%) $p = 0.04$?

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 [1]. 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.

The weaknesses of this study are, on the one hand, the means of assessing the pain and discomfort that are subjective with individual variability and, on the other hand, the underlying nerve lesions that could constitute biases.

in Outpatients Who had Carpal Tunnel Surgery

Table 1: The distribution of patients according to the type of anesthesia

admission examination	Total (n = 185)	Wrist n = 105	Proximal n = 80	OR and CI 95%
gender				
men				
women	51 (27.6%)	29 (27.6%)	22 (27.5%)	RR: 1.00 [0.76-1.33] p = 0.56
arm surgery				
right	134 (72.4%)	76 (72.4%)	58 (72.5%)	
left	111 (60%)	65 (61.9%)	46 (57.5%)	RR: 1.08 [0.83-1.41] p = 0.54
surgeon				
experimented	74 (40%)	40 (38.1%)	34 (42.5%)	
not experimented	151 (81.6%)	79 (75.2%)	72 (90.0%)	RR: 0.68 [0.54-0.87] p = 0.01
blockage of the musculo cut				
1.1.2 It requests the Commission to develop adequate indicators for assessing the implementation of the Decent Work Agenda by the EU.	34 (18.4%)	26 (24.8%)	8 (10%)	
No	87 (47%)	24 (22.9%)	63 (78.8%)	
further AL				
yes	98 (53%)	81 (77.1%)	17 (21.3%)	RR: 0.33 [0.23-0.47] P <0.0001
No	41 (22.2%)	29 (27.6%)	12 (15%)	RR: 1.34 [1.04-1.72] p = 0.08
dominant side				
right	144 (77.8%)	76 (72.4%)	68 (85.1%)	
left	167 (90.1%)	96 (91.4%)	71 (88.8%)	RR: 1.15 [0.71-1.86]P = 0.72
Active smoking				
tobacco	18 (9.9%)	9 (8.6%)	9 (11.2%)	
No	26 (14.3%)	16 (15.2%)	10 (12.5%)	RR: 1.10 [0.79-1.53]P = 0.75
bmi > 30m / kg2				
yes	159 (85.7%)	89 (84.8%)	70 (87.5%)	
No	48 (26%)	28 (26.7%)	20 (25%)	RR: 1.04 [0.78-1.37]P = 0.80
Day 0 - 3 post op pain				
yes	121 (65.6%)	71 (69.5%)	50 (62.5%)	
No	64 (34.4%)	34 (30.5%)	30 (37.5%)	RR : 1.10 [0.84-1.45]P=0.47

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 musculo-cutaneous blockage have a protective effect but the addition of anesthesia is a risk factor.

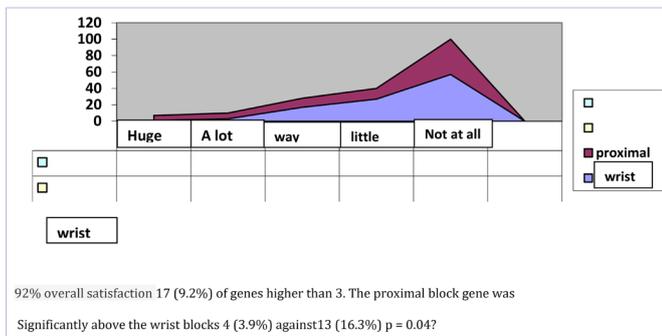


Figure 1: comparison of level of gene based on the anesthesia

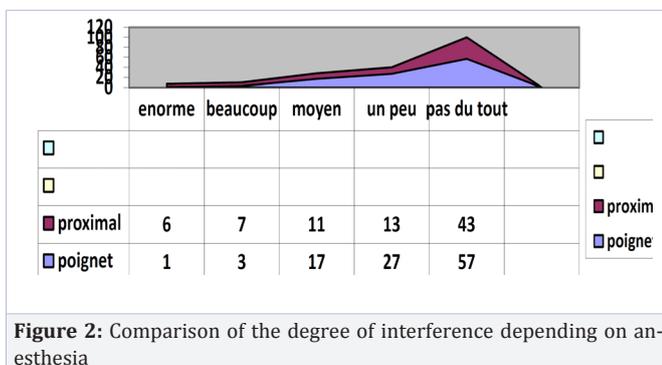


Figure 2: Comparison of the degree of interference depending on anesthesia

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 are 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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