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Original Research

Comparative Study, Walant vs Axillary Block in Carpal Tunnel Surgery

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ABSTRACT

Objective: Wide awake local anesthesia no tourniquet (WALANT) is a local anesthetic technique that, in theory, reduces costs and surgical waiting periods. The purpose of this study was to compare axillary block (AXB) with WALANT in terms of pain scores, duration of hospital stay, and hand function in patients who underwent CTR surgery.

Methods: Between January 2015 and February 2020, a retrospective analysis was conducted on the outcomes of 410 patients who underwent CTS surgery. The Walant technique was utilized on 210 patients, while the AXB technique was utilized on 200 patients. These two groups were compared regarding operative time, hospital stay, VAS score at specific intervals before and after surgery, and hand function recovery.

Results: The mean operation time is 11 min (8-18) for the WALANT group and 12 min (5-34) for the AXB group. The average time of the length of hospitalization is 4.2 hours (2-6) for the WALANT and 14.2 hours (9-26) for the AXB groups. The mean hospitalization time and the VAS scores of the WALANT group are significantly less than the AXB group (p=0.02 and p=0.03 respectively). The percentages of being able to use their hands compared to their nonoperative hands were evaluated. These rates were higher in the WALANT group than in the AXB group (65-75% vs. 45-60%).

Conclusion: Increased patient comfort was associated with the WALANT technique. It is superior to AXB in terms of patient satisfaction, postoperative long-term pain management, and hand function recovery. Assuming all safety recommendations are adhered to, the WALANT is an alternative to tourniquets in CTS surgeries for obtaining a bloodless surgical field without the discomfort of tourniquet application.

Keywords: Carpal Tunnel Surgery, WALANT, Axillary Block, VAS, patient satisfaction.

INTRODUCTION

Carpal Tunnel Syndrome (CTS) is the most frequent form of upper-limb compression neuropathy [1]. It is typically more prevalent in individuals over the age of 40. There are numerous techniques for carpal tunnel release (CTR), including open, endoscopic, and ultrasound-guided procedures [2,3].

The Wide Awake Local Anesthesia with No Tourniquet (WALANT) technique has emerged as a popular and effective alternative to sedating anesthetic techniques or axillary blocks that requires monitoring for carpal tunnel surgery [4]. However, the literature lacks data regarding patient satisfaction with regard to anesthesia type and surgery location [5].

In carpal tunnel release surgery, a bleeding-free environment is especially needed for clear visualization of the motor branch

and adequate nerve release. Until 2015, all carpal tunnel release surgeries performed in our clinic were performed under axillary anesthesia with a tourniquet. Generally, in dialysis patients, if there was a fistula in the same arm, local anesthesia was applied. After 2016, operations were performed with WALANT in CTS operations. Clinical diagnosis was based on the presence of symptoms including paresthesia or numbness (or both) in the median nerve distribution, nocturnal paresthesias, aching, weakness, and atrophy of the thenar eminence [6]. This study's objective was to compare axillary block (AXB) with WALANT in patients who underwent CTR surgery in terms of pain scores, length of hospital stay, and hand function.

MATERIALS AND METHODS

This was a retrospective, single-center, single-surgeon observational study conducted at the university hospital. This investigation was approved by the Institutional Review Board (Protocol No. 2023/23/21). Informed consent was obtained from all participants. We included a total of 410 patients who underwent CTR between January 1, 2015 and February 28, 2020. This study excluded pregnant and postpartum women, patients who refused the terms of the consent statement, and patients who stated they had previously undergone hand or wrist surgery. The standard mini-open incision for carpal tunnel release was performed. According to the anesthetic technique used to treat these 410 patients, they were divided into two groups of 210 and 200 patients each. WALANT contained 100 ml of 1% lignocaine, 1 ml of epinephrine (1:1000), and 10 ml of 8.4% sodium bicarbonate for a total of 111 ml. 10 ml of WALANT is used for each patient. The AXB group consisted of 200 patients (140 females and 60 males) with a mean age of 52.7 years (40–70). In the Walant group, there were 210 patients (144 females and 66 males) with a mean age range of 54.6 (42–75) years. The duration of hospitalization was determined, and VAS assessment of postoperative pain was performed. VAS was performed four times on each patient: per-operatively, two hours after surgery, twenty-four hours after surgery, and forty-eight hours after surgery. In the 24-48 hour patient reported outcomes, the percentage of using the hand on the operated side compared to the other hand was questioned. Out-of-hospital pain questioning of the patients was performed by telephone contact. The results between AXB group and WALANT group were compared. The chi-square test was used to analyze the relationship between the categorical variables and the results from both groups. To compare the groups in relation to continuous variables, the Student's t test (parametric) or the Mann-Whitney U test was utilized. The significance level was set at 5%.

Main Points;

- The WALANT technique is superior to AXB in carpal tunnel surgery for both the patient and the surgeon.
- In the postoperative period, WALANT is associated with less pain and greater motion gain.
- WALANT is more advantageous than AXB in terms of length of hospital stay and hospital costs.

RESULTS

Demographics is given in Table 1. The mean operative time was 12 minutes (min: 5, max: 34) for the entire cohort: 11 minutes (min: 8, max: 18) for the WALANT group, and 13 minutes (min: 7, max: 34) for the AXB group. With AXB, the average length of hospitalization was 14.2 hours (9–26 hours), while with WALANT, it was 4.2 hours (2–6 hours). By employing a VAS, postoperative pain was evaluated. With AXB, the per-operative VAS score was 0.2 (0–0.5), whereas with WALANT, it was 0.3 (0–0.6). At two hours postoperatively, the VAS score was 0 for AXB and 0 for WALANT. At 24 hours, the VAS score with AXB was 1.2 (0.5–4) and with WALANT it was 0.5 (0–2). At 48 hours, the VAS score with AXB was 0.8 (0–2) and with WALANT it was 0.4 (0–1). With WALANT, the patients were able to use the operated hand. 65% at 24 hours and 75% at 48 hours, compared to the other hand. The mean hospitalization time and the VAS scores of the WALANT group were significantly lower than those of the AXB group ($p = 0.02$ and $p = 0.03$ respectively). With AXB, the patients were able to use their operated hand at 24 hours and 60% at 48 hours compared to the other hand (See Table 2).

DISCUSSION

It has been reported that Walant is a potent and comfortable analgesic for patients [7,8] as well as handy for surgeons and healthcare systems [9,10]. It has even enabled the relocation of such surgeries outside the main surgery center with no rise in surgical risk, no change in clinical results, and a reduction in cost [11-13]. In our study, WALANT produced more favorable results compared to AXB in terms of pain scores, hand function, and hospitalization length of time. Upon comparing the results, we found that the per-operative pain VAS evaluation with WALANT was slightly higher than with axillary anesthesia. We

Table 1. Demographics of Cohort.

	WALANT	AXB	Total	p-value
Patient number	210	200	410	
Age (years)	54.6 (42-75)	52.7 (40-70)	53.1 (40-75)	0.87
Sex (Female/Male)	144/66	140/60	284/126	0.64
Mean duration of procedure (min)	11 (8-18)	13 (7-34)	12 (7-34)	0.02

Table 2. Comparison of the results of two groups according to VAS score and hand functions.

	WALANT	Axiller
Number of Patients	210	200
Time of Hospitalization (hours)	4.2(2-6)	14.2 (9-26)
VAS Pre-op	0.3(0-0.6)	0.2(0-0.5)
VAS Post op 2h	0	0
VAS Post op 24h	0.5(0-2)	1.2(0.5-4)
VAS Post op 48h	0.4(0-1)	0.8(0-2)
Rate of hand functions (post op 24h)	65%	45%
Rate of hand functions (post op 48h)	75%	60%

believe this is the result of the local injection. At 2-hour controls, axillary anesthesia and WALANT did not differ significantly from one another. At 24 and 48 hours, the VAS evaluation of the WALANT group was superior to axillary anesthesia. These results are also consistent with the literature. Boukebous et al reported patient satisfaction appeared to be same between WALANT and AXB. WALANT found as effective and safe as AXB [5]. Although epinephrine-induced digital ischemias and tissue necrosis have been reported in the medical literature and are typically attributable to dosing errors [14], we did not observe any complications in our patients. No peripheral venous access or monitoring is required when administering safe doses of local anesthetic [15]. Reportedly, advantages such as not requiring anesthesia consultation, less hospital time, not requiring fasting prior to the procedure, and establishing a more compliant relationship with the physician enhance patient satisfaction [16]. We believe that these previously reported factors may be associated with patient satisfaction in our study.

In the medical literature, tourniquet use has been linked to instances of transient pain, paresthesia, transient nerve damage, and even complete nerve paralysis [17,18]. It was the primary cause of discomfort. It is therefore advised to avoid tourniquet use if hemostasis can be achieved. Walant's epinephrine is vasoconstrictive and has a hemostatic effect [19]. In their study, Gunasagaran et al. demonstrated that the local anesthetic plus tourniquet group was not superior to the WALANT group in terms of less bleeding [20]. In our study, a tourniquet was applied to all patients who underwent AXB, and postoperative bleeding was controlled. All patients were given a drain, which was removed 24 hours following surgery. Patients who underwent WALANT were not administered drain and we did not encounter any bleeding problems in in WALANT group of our study. Ecchymosis extending from the arm to the elbow region after axillary anesthesia was seen in 4 patients. Skin problems around the tourniquet due to tourniquet compression were observed in 2 patients. Patients reported that these problems had a negative effect on patient satisfaction. Our outcomes are consistent with recent research.

Limitations

The limitations of the study were the short follow up time and retrospective in which satisfaction and pain perception may change over time. Prospective long term follow up study needed.

CONCLUSION

The WALANT technique was associated with increased patient comfort. It is more effective than AXB in patient satisfaction,

postoperative long-term pain management, and recovery of hand functions. Tourniquets were the most significant cause of discomfort during surgical procedures. Therefore, WALANT is a choice to tourniquets for achieving a bloodless surgical area during CTS procedures without experiencing the discomfort of tourniquet deployment, assuming all safety suggestions were adhered to.

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All authors have made substantial contributions in the interpretation of data, revising the article critically and all approved of the final version for submission.

All authors disclosed no relevant relationships.

Ethical Approval: The study was initiated following approval from the Ethics Committee of Nişantaşı University (approval number 2023/23/21, Date: 2023-06-12), and all procedures were conducted in accordance with the principles outlined in the Declaration of Helsinki.

Authors' Contribution

Concept – Z.S., I.B.Ö; Design– Z.S Supervision – Z Z.S., I.B.Ö; Materials – Z.S., I.B.Ö; Data Collection and/or Processing – Z.S., I.B.Ö.; Analysis and/or Interpretation - Z.S., I.B.Ö.; Literature Review – Z.S., I.B.Ö.; Writing – Z.S., I.B.Ö; Critical Review - Z.S., I.B.Ö.

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