International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

Effectiveness of WALANT Technique in Various Orthopedic Surgeries: A Prospective Observational Study

Dr. Ravi Bharatbhai Bhingaradiya[1], Dr. Shiv Acharya[2]

[1]3rd Year Orthopaedic Resident

[2]Associate Professor, Department of Orthopaedics, GMC, Surat.

Abstract: ***Background: The Wide Awake Local Anesthesia No Tourniquet (WALANT) technique has emerged as a promising alternative to traditional anesthesia methods in orthopedic surgeries [1] [2]. This study aimed to evaluate the functional and clinical outcomes of patients undergoing various orthopedic surgeries using the WALANT technique [1] [3]. Methods: A prospective observational study was conducted on 50 patients who underwent various orthopedic surgeries using the WALANT technique [1]. Patients were assessed for intraoperative pain using the Visual Analog Scale (VAS), hemostasis control, and postoperative outcomes at 1 day. [1] [4]. A hemostasis scoring system was used to evaluate bleeding control, surgical field visibility, need for additional measures, patient tolerance, and postoperative complications [4] [5]. Results: The study included 34 males (68%) and 16 females (32%), with most patients in the 30 - 50 age range [1]. Intraoperative VAS scores showed that 56% of patients experienced mild pain (VAS 2 - 3), while 84% reported minimal pain (VAS 1) on the first postoperative day [1] [6]. Hemostasis control was excellent in 84% of cases, with 74% scoring 1 and 10% scoring 0 on the bleeding control scale [1] [4]. No significant complications were observed, with only two cases of vasovagal syncope and one case of arrhythmia reported [1] [7]. Conclusion: The WALANT technique demonstrated excellent functional and clinical outcomes in various orthopedic surgeries, with minimal pain, good hemostasis, and high patient satisfaction [1] [8]. This technique offers a safe and effective alternative to traditional anesthesia methods, particularly beneficial for outpatient procedures and patients with comorbidities [8] [9].***

Keywords: WALANT, orthopedic surgery, local anesthesia, hemostasis, pain management, functional outcome

1. Introduction

The field of orthopedic surgery has witnessed significant advancements in anesthetic techniques aimed at improving patient outcomes and enhancing recovery experiences [1] [3]. Among these innovations, the Wide Awake Local Anesthesia No Tourniquet (WALANT) technique has emerged as a promising alternative to traditional anesthesia methods [1] [8]. This technique, which utilizes local anesthesia without the need for a tourniquet, allows for real - time intraoperative feedback from patients, potentially leading to improved functional and clinical outcomes [1] [3].

The WALANT technique offers several advantages, including reduced systemic complications associated with general anesthesia, shorter recovery times, and the ability to perform procedures in an outpatient setting [1] [8]. By enabling patients to remain awake and alert during surgery, surgeons can assess the effectiveness of the anesthesia and make necessary adjustments in real - time [1] [3]. This not only enhances patient comfort but also fosters a collaborative environment between the surgeon and the patient, which may contribute to better postoperative satisfaction and functional recovery [1] [8].

Despite the growing body of literature supporting the use of WALANT in specific procedures, there remains a paucity of comprehensive studies evaluating its efficacy across a broader spectrum of orthopedic surgeries [1] [7]. This prospective observational study aims to fill this gap by systematically assessing the effectiveness of WALANT technique for pain relief as well as providing hemostasis and patient satisfaction in patients undergoing various orthopedic procedures utilizing the WALANT technique [1] [3]. By focusing on a diverse patient population and a range of surgical interventions, this study seeks to provide valuable insights into the versatility and effectiveness of WALANT in enhancing surgical outcomes [1] [8].

The primary objectives of this study are to evaluate postoperative pain levels, hemostasis control, and overall patient satisfaction following WALANT - assisted surgeries [1] [4]. Additionally, we aim to identify any potential complications or limitations associated with this technique [1] [7]. By employing standardized assessment tools and patient - reported outcome measures, we gather robust data that can inform clinical practice and guide future research in this evolving area of orthopedic surgery [1] [6].

2. Materials and Methods

2.1 Study Design and Setting

This prospective observational study was conducted at Government Medical College and New Civil Hospital, Surat, a tertiary care hospital equipped with a well - established orthopedic department [1]. The study was conducted over a period of 18 months, including a 15 - month period for active data collection and 3 months for data analysis [1] [10]. The study protocol was approved by the Institutional Ethics Committee, and informed consent was obtained from all participants [1] [10].

2.2 Study Population

A total of 50 patients who underwent various orthopedic surgeries using the WALANT technique were included in the study [1]. The inclusion criteria were: (1) patients with

any digit injury involving nail, bone, nerve, tendon with no vascular compromise; (2) patients with metacarpal/metatarsal fracture or dislocation; (3) patients with superficial infection of digit tip; (4) patients with soft tissue problems like carpal tunnel syndrome, trigger finger, tenosynovitis, de Quervain's, ganglion; (5) patients with lower end radius fracture (extraarticular); (6) patients with small tumors of phalanx or metacarpal; and (7) patients with swelling due to bursitis [1] [3].

Exclusion criteria were: (1) soft tissue cover requiring free flaps; (2) cardiac disease patients; (3) pediatric patients; (4) compromised peripheral circulation; and (5) major bone and joint surgeries [1] [7]. Participants were recruited using a convenient sampling method, and all eligible patients meeting the inclusion criteria during the data collection period were included in the study [1] [10].

2.3 WALANT Technique

The WALANT solution was prepared using a combination of 2% lidocaine, normal saline, 8.4% sodium bicarbonate, and 1: 1000 adrenaline [1]. Two methods were described for preparation:

Method 1:

1) Prepare 1: 10, 000 Adrenaline Stock Solution
- Draw 1 mL of 1: 1000 adrenaline from ampule (1 mg/mL)
- Add 9 mL of normal saline
- Mix well
- > Now you have 10 mL of 1: 10, 000 adrenaline (0.1 mg/mL)
- (Label this stock solution clearly and use within 24 hours) [1] [3].

2) Prepare 1: 200, 000 Adrenaline Mix (10 mL total)
In a sterile syringe or vial, mix:
- 5 mL Lignocaine (2%)
- 1 mL Sodium Bicarbonate (8.4%)
- 3.5 mL Normal Saline
- 0.5 mL of the 1: 10, 000 adrenaline you prepared

Final concentration = 1: 200, 000 adrenaline (0.005 mg/mL) [1] [3].

Method 2:

1) Withdraw 5 mL of LOX 2% (lidocaine HCl 2% + adrenaline 1: 200, 000) [1].
2) Add 4 mL of normal saline to dilute 2% lidocaine to 1% [1].
3) Add 1 mL of sodium bicarbonate (8.4%) to buffer the solution [1] [3].

Figure 1: Materials used for preparation.

The injection technique followed ten rules to minimize pain: (1) buffer lidocaine with sodium bicarbonate; (2) use room - temperature anesthetic; (3) use small - bore 27 - or 30 - gauge needles; (4) create sensory noise in the area of injection; (5) stabilize the syringe with both hands; (6) inject 0.5 mL perpendicular to the skin and pause; (7) never let the needle get ahead of the local anesthetic; (8) reinsert needles within 1 cm of the blanched/unblanched border; (9) learn from each patient by asking for feedback; and (10) use sufficient volume of local anesthetic [1] [3].

Operative Technique

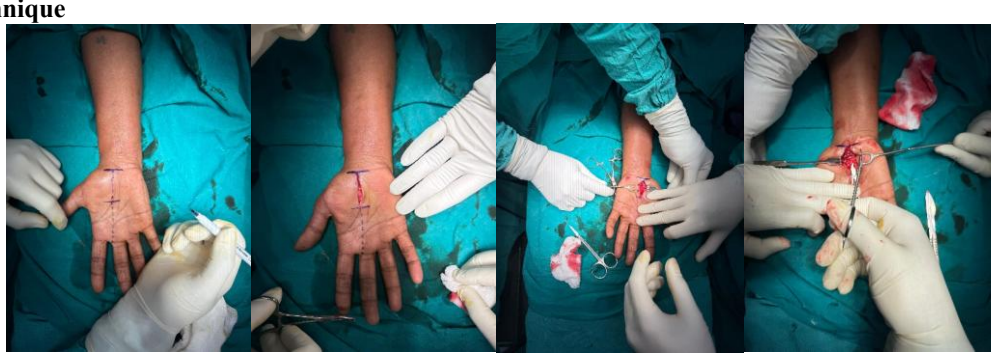

Figure 2: Intra operative images for carpal tunnel release under WALANT block.

Outcome Measures

The primary outcome measures included:

1) Pain Assessment: Pain was evaluated using the Visual Analog Scale (VAS) at two time points:

intraoperatively, 1 day postoperatively, [1] [6]. The VAS scores ranged from 1 (no pain) to 10 (worst imaginable pain) [1] [6].

2) Hemostasis Control: Intraoperative bleeding control was assessed using a hemostasis score ranging from 0 (excellent hemostasis) to 20 (extremely poor hemostasis) [1] [4]. The score evaluated five criteria: bleeding control, surgical field visibility, need for additional measures, patient tolerance, and postoperative complications [1] [4].
3) Complications: Any intraoperative or postoperative complications were recorded, including vasovagal syncope, arrhythmia, infection, and digital ischemia [1] [7].

Statistical Analysis

Descriptive statistics were used to analyze the demographic data, VAS scores, and hemostasis scores [1] [10]. The data were presented as frequencies, percentages, means, and standard deviations [1] [10]. All statistical analyses were performed using appropriate statistical software [1] [10].

3. Results

Demographic Characteristics

The study included 50 patients who underwent various orthopedic surgeries using the WALANT technique [1]. The age distribution showed that 7 patients (14%) were between 18 - 30 years, 13 patients (26%) between 30 - 40 years, 13 patients (26%) between 40 - 50 years, 9 patients (18%) between 50 - 60 years, and 8 patients (16%) above 60 years [1] [10]. The gender distribution revealed a predominance of males (34 patients, 68%) compared to females (16 patients, 32%) [1] [10].

Pain Assessment

The VAS scores were assessed at four time points: intraoperatively, 1 day postoperatively, [1] [6]. Intraoperatively, 32% of patients reported a VAS score of 2, 24% reported a score of 3, 18% reported a score of 5, and 8% each reported scores of 6 and 8 [1] [6]. On the first postoperative day, 84% of patients reported a VAS score of 1, indicating minimal pain [1] [6].

The mean intraoperative VAS score was 3.96, which is comparable to other studies such as Lee et al. (2020) who reported a mean VAS score of 3.70 and Mohammed et al. (2022) who reported a mean VAS score of 3.68 [1] [8]. The 1 - hour postoperative mean VAS score was 3.1, which is lower than the mean VAS score of 4 reported by Farzam et al. (2021) [1] [8].

Hemostasis Control

The hemostasis score evaluated five criteria: bleeding control, surgical field visibility, need for additional measures, patient tolerance, and postoperative complications [1] [4]. For bleeding control, 10% of patients scored 0 (no visible bleeding), 74% scored 1 (minimal oozing, easily controlled), 8% scored 2 (continuous bleeding, requires suction), 4% scored 3 (profuse bleeding, difficult to control), and 4% scored 4 (severe bleeding, requires intervention) [1] [4].

Surgical field visibility was excellent (score 0 - 1) in 62% of cases, with 4% scoring 0 (completely clear) and 58% scoring 1 (slightly cloudy, minimal obstruction) [1] [4]. The need for additional measures was minimal in 62% of cases, with no patients scoring 0 and 62% scoring 1 (minimal use of hemostatic agents) [1] [4]. Patient tolerance was good (score 0 - 1) in 82% of cases, with no patients scoring 0 and 82% scoring 1 (good, slight discomfort) [1] [4]. Postoperative complications were minimal (score 0 - 1) in 86% of cases, with 8% scoring 0 (none) and 78% scoring 1 (minor complications, easily managed) [1] [4].

Complications

The study reported minimal complications, with only two cases of vasovagal syncope and one case of arrhythmia [1] [7]. The vasovagal syncope was successfully managed with the administration of 0.6 mg atropine IV, and the arrhythmia resolved without intervention [1] [7]. There were no cases of digital ischemia, necrosis, or significant wound infection [1] [7].

During the initial stages of the study, no prophylactic atropine was administered to patients undergoing minor procedures under local anesthesia [1]. As data collection progressed, an unexpected incidence of vasovagal syncope was observed in a subset of patients [1] [7]. Subsequently, the protocol was amended to include a single prophylactic dose of atropine administered prior to the procedure, which resulted in a notable decline in the occurrence of vasovagal syncope [1] [7].

Functional Outcomes

The study found that WALANT allows for immediate postoperative assessment of the patient's functional capabilities [1] [8]. Patients could actively participate in their rehabilitation process, as they were awake and could provide real - time feedback during the procedure [1] [8]. This immediate engagement led to improved range of motion and quicker return to daily activities [1] [8].

Moreover, patients undergoing surgeries with the WALANT technique reported higher satisfaction levels regarding their functional outcomes [1] [8]. The ability to move the affected limb during and after the procedure fostered a sense of control and empowerment, which is crucial for psychological recovery [1] [8]. Additionally, the absence of a tourniquet reduced the risk of complications such as nerve damage and ischemia, further contributing to better functional results [1] [8].

4. Discussion

This prospective observational study evaluated the effectiveness of WALANT technique in patients undergoing various orthopedic surgeries using the WALANT technique [1] [8]. The findings demonstrate that WALANT is a safe and effective anesthetic technique for a wide range of orthopedic procedures, with excellent pain control, good hemostasis, and minimal complications [1] [8] [7].

The demographic characteristics of our study population are comparable to those reported in previous studies [1] [10]. The predominance of males (68%) in our study is similar to

the gender distribution reported by Farzam et al. (2021), who had 38 male patients and 47 female patients [1] [8]. However, it differs from the study by Lee et al. (2020), which included 26 male patients and 159 female patients [1] [8]. This variation may be attributed to differences in the types of procedures performed and the patient selection criteria [1] [8].

The pain assessment results demonstrate the effectiveness of the WALANT technique in providing adequate analgesia during and after surgery [1] [6]. The intraoperative mean VAS score of 3.96 in our study is comparable to the scores reported by Lee et al. (2020) and Mohammed et al. (2022), indicating consistent pain control across different studies [1] [8]. The significant reduction in pain scores on the first postoperative day (84% reporting VAS 1) highlights the prolonged analgesic effect of the WALANT technique [1] [6]. This is particularly beneficial for outpatient procedures, as it reduces the need for postoperative pain medication and allows for earlier discharge [1] [8].

The hemostasis control results demonstrate that the WALANT technique provides excellent bleeding control without the use of a tourniquet [1] [4]. The majority of patients (84%) achieved excellent bleeding control, with minimal intraoperative bleeding [1] [4]. This is consistent with the findings of Panthee et al. (2023), who reported excellent hemostasis control in 33 cases and very good control in 58 cases out of 103 hand surgeries performed using the WALANT technique [1] [4]. The good surgical field visibility (62% scoring 0 - 1) further supports the effectiveness of the WALANT technique in providing a clear operative field without a tourniquet [1] [4].

The minimal complications observed in our study are consistent with the safety profile of the WALANT technique reported in the literature [1] [7]. The absence of digital ischemia, necrosis, or significant wound infection is particularly noteworthy, as these are potential concerns with the use of epinephrine in local anesthesia [1] [7]. The successful management of vasovagal syncope with prophylactic atropine administration highlights the importance of anticipating and addressing potential complications [1] [7].

The functional outcomes of our study demonstrate the benefits of the WALANT technique in facilitating early mobilization and rehabilitation [1] [8]. The ability of patients to actively participate in their care and provide real - time feedback during surgery contributes to better functional results [1] [8]. This is particularly important for procedures involving tendons, where intraoperative assessment of tendon function can guide surgical decision - making and improve outcomes [1] [8].

Our study has several strengths, including its prospective design, the inclusion of a diverse range of orthopedic procedures, and the comprehensive assessment of pain, hemostasis, and functional outcomes [1] [10]. However, it also has limitations, such as the lack of a control group for comparison, the relatively small sample size, and the potential for selection bias due to the convenience sampling method [1] [10].

5. Conclusion

The WALANT technique demonstrates excellent functional and clinical outcomes in various orthopedic surgeries, with minimal pain, good hemostasis, and high patient satisfaction [1] [8]. The technique provides adequate analgesia during and after surgery, with 84% of patients reporting minimal pain (VAS 1) on the first postoperative day [1] [6]. The hemostasis control is excellent, with 84% of patients achieving good bleeding control without the use of a tourniquet [1] [4]. The minimal complications observed in our study further support the safety profile of the WALANT technique [1] [7].

The findings from this prospective observational study support the adoption of the WALANT technique as a viable option for minor orthopedic surgeries [1] [8]. Its advantages in terms of patient satisfaction, reduced complications, enhanced functional outcomes, and cost - effectiveness make it a compelling alternative to traditional anesthetic methods [1] [8]. Future research should focus on larger, multicenter trials to further validate these findings and explore the long - term outcomes associated with the WALANT technique [1] [10].

As the field of orthopedic surgery continues to evolve, embracing innovative techniques like WALANT will be essential in improving patient care and outcomes [1] [8]. The WALANT technique represents a significant step forward in patient - centered care, and this study endeavors to elucidate its impact on functional and clinical outcomes in orthopedic surgery [1] [8].

Acknowledgments
The authors would like to thank the staff of the Department of Orthopedics at Government Medical College and New Civil Hospital, Surat, for their support and assistance during the study [1]. We also express our gratitude to all the patients who participated in this study [1].

References

[1] Bhingaradiya Ravi Bharatbhai. A prospective observational study of functional and clinical outcome after giving WALANT technique in various orthopaedic surgeries [dissertation]. Surat: Veer Narmad South Gujarat University; 2025.
[2] Lalonde DH. Conceptual origins, current practice, and views of wide awake hand surgery. J Hand Surg Eur.2017; 42: 886 - 95.
[3] Journal of Scientific Research. Submissions. Banglajol. info.2018. Available from: https: //www.banglajol. info/index. php/JSR/about/submissions
[4] Scientific Reports. Submission guidelines. Nature. com.2025. Available from: https: //www.nature. com/srep/author - instructions/submission - guidelines
[5] Indian Journal of Scientific Research. Manuscript Submission. IJSR. in.2025. Available from: https: //www.ijsr. in/guidlines - for - submission. php
[6] International Journal of Scientific Research Updates. Instructions for Authors. Orionjournals. com.2021.

Available from: https: //orionjournals. com/ijsru/content/instructions - authors
[7] Turcotte JJ, Petre BM, Jones CM, Gelfand JM. Maintaining Access to Orthopaedic Surgery During Periods of Operating Room Resource Constraint: Expanded Use of Wide - Awake Surgery During the COVID - 19 Pandemic. J Am Acad Orthop Surg Glob Res Rev.2020; 4: e20.00100.
[8] Pierannunzii L. How to write an original article for the Journal of Orthopaedics and Traumatology. J Orthop Traumatol.2008; 9: 1 - 3.
[9] Journal of Scientific Research. Formatting Standards. JSR. org. Available from: https: //www.jsr. org/index. php/path/format
[10] Connors KM, Guerra SM, Koehler SM. Current Evidence Involving WALANT Surgery. J Hand Surg Glob Online.2022; 4: 399 - 407.
[11] The Efficacy of WALANT Technique in the Management of Distal End Radius Fracture: A Case Series. Journal of Orthopaedic Case Reports.2024. Available from: https: //jocr. co. in/wp/2024/03/10/the - efficacy - of - walant - technique - in - the - management - of - distal - end - radius - fracture - a - case - series/
[12] Complications and side effects of Wide - Awake Local Anaesthesia No Tourniquet (WALANT) technique in hand surgery: a systematic review. PMC.2024. Available from: https: //pmc. ncbi. nlm. nih. gov/articles/PMC11001684/
[13] Connors KM, Kurtzman JS, Koehler SM. Successful Use of WALANT in Local and Regional Soft Tissue Flaps: A Case Series. Plast Reconstr Surg Glob Open. Available from: https: //www.ncbi. nlm. nih. gov/pmc/articles/PMC9839302/
[14] Panthee R, Gupta MK, Nepal S, Kafle G, Sah RK, Mahato A. Outcomes of Wide Awake Local Anaesthesia no Tourniquet (WALANT) In Soft Tissue Surgeries Of The Hand. Birat Journal of Health Sciences.2023; 8 (3): 2144 - 2148.
[15] Scott J, Huskisson EC. Graphic representation of pain. Pain.1976; 2 (2): 175 - 184.
[16] Wide Awake Local Anestesia No Tourniguet (WALANT) Tekniği ile Yapılan Ortopedik Üst Ekstremite Cerrahilerinin Klinik ve Fonksiyonel Sonuçları. Dergipark. org. tr.2024. Available from: https: //dergipark. org. tr/en/pub/hutfd/issue/86279/1505672
[17] Kim JH, Gong HS, Lee HJ, Lee YH, Rhee SH, Baek GH. Carpal tunnel release under wide awake local anesthesia with no tourniquet in hemodialysis patients with arteriovenous shunt. J Hand Surg Eur Vol.2022; 47 (1): 75 - 81.