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WIDE-AWAKE LOCAL ANESTHESIA NO TOURNIQUET (WALANT) FOR ELECTIVE FOREFOOT SURGERY: PROSPECTIVE CASE SERIES OF 30 PATIENTS DESCRIBING PROTOCOL, ANALGESIC EFFICACY, AND PROM'S RESULTS

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ABSTRACT

Background: Wide-Awake Local Anesthesia No Tourniquet (WALANT) is a relatively new anesthetic technique for elective forefoot surgery that avoids general or neuraxial anesthesia, popliteal nerve blocks, and tourniquet use while allowing active intraoperative patient participation. Originally developed for hand surgery, its application to forefoot procedures remains insufficiently characterized.

Methods: We conducted a single-center prospective case series of 30 consecutive adult patients undergoing elective forefoot surgery under a standardized WALANT protocol. The anesthetic solution consisted of subcutaneous 1% lidocaine with epinephrine 1:200,000. Primary outcomes were intraoperative and postoperative pain measured using the Numeric Rating Scale (NRS 0–10) at four timepoints, and patient satisfaction across seven domains using a 5-point Likert scale. Secondary outcomes included operative time and safety profile within 48 hours.

Results: Mean age was 65.2 ± 9.7 years; 80% of patients were female. Indications included hallux valgus (56.7%), hallux rigidus (16.7%), hallux valgus with metatarsalgia (13.3%), and isolated metatarsalgia (13.3%). Mean operative time was 32.3 ± 9.4 minutes. Mean intraoperative NRS was 0.17 ± 0.38, increasing to 0.23 ± 0.50 at immediate recovery, 1.47 ± 2.01 at 6 hours, and 1.97 ± 1.90 at 24 hours. No intraoperative complications occurred, and no case required conversion to regional or general anesthesia. Minimal pain during surgery (agree/strongly agree) was reported by 96.7% of patients, and overall surgical experience was rated positively by 83.3%. Nine patients (30%) presented with mild postoperative wound oozing requiring dressing reinforcement or change; no hematomas, infections, neurovascular injuries, or reoperations were observed.

Conclusion: WALANT is a safe, effective, and well-tolerated anesthetic strategy for elective forefoot surgery, providing near-complete intraoperative analgesia and high patient satisfaction without the need for tourniquet or regional block. Mild postoperative wound oozing appears to be an expected effect of tourniquet-free surgery and should be regarded as a manageable, anticipated event rather than a true surgical complication, provided appropriate patient education is delivered.

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KEYWORDS
Wide-awake local anesthesia, WALANT, forefoot surgery, hallux valgus, local anesthesia, no tourniquet, patient satisfaction, epinephrine

INTRODUCTION

Elective forefoot surgery encompasses a wide range of procedures, including correction of hallux valgus and hallux rigidus and the treatment of various metatarsal disorders[1-3]. These operations are among the most frequently performed in foot and ankle units worldwide. They have traditionally been carried out under general anesthesia, spinal anesthesia, or regional nerve blocks such as popliteal sciatic or ankle blocks, all of which, although effective, entail exposure to systemic anesthesia, postoperative nausea and vomiting, longer recovery, mandatory fasting, and the need for a dedicated anesthesia team and preoperative work-up[1].

The WALANT technique, formally developed and validated by Lalonde and colleagues in the context of hand surgery, is based on subcutaneous injection of a dilute lidocaine-epinephrine solution into the operative field[4-7]. Lidocaine provides local anesthetic blockade via voltage-gated sodium channel inhibition, while epinephrine induces alpha-adrenergic vasoconstriction, which prolongs the local anesthetic effect and improves hemostasis by delaying systemic absorption. This dual mechanism eliminates the need for both systemic anesthesia and tourniquet use, while the patient remains awake and cooperative throughout the procedure[8].

In hand surgery, WALANT has rapidly become a standard approach for many procedures, with documented benefits including high patient satisfaction, reduced costs, shorter waiting times, avoidance of tourniquet-related pain, intraoperative active range-of-motion assessment, and reduced postoperative opioid requirements. Interest in translating these principles to lower extremity surgery has grown over the past decade. MacNeill and Mayich first showed that wide-awake foot and ankle surgery was feasible and associated with low perioperative anxiety and pain[9]. Wright et al. later demonstrated that wide-awake forefoot surgery resulted in significantly lower postoperative pain and anxiety compared with general anesthesia[10-11]. Bleich et al. reported that WALANT was a viable and cost-effective option for hallux valgus correction, and Lavigne et al. found comparable postoperative pain between WALANT and general anesthesia with local infiltration in forefoot bone surgery[12]. Additional series have confirmed the feasibility of WALANT in foot and ankle trauma and elective surgery.

Ballester et al. recently published the first description of a WALANT protocol specifically adapted to hallux valgus correction at our institution, detailing the anesthetic preparation, injection technique, and technical aspects[13]. That work established the institutional protocol and enabled its systematic integration into routine forefoot surgery. However, prospective data on clinical outcomes and patient-reported satisfaction using this standardized forefoot WALANT protocol are lacking.

The objective of this study was to prospectively evaluate the analgesic efficacy, patient satisfaction, and short-term safety of a standardized WALANT protocol for elective forefoot surgery in a consecutive series.

MATERIALS AND METHODS

Study design and patient selection

We conducted a prospective observational case series at a single orthopedic surgery unit. Consecutive patients scheduled for elective forefoot surgery between October 2024 and October 2025 were screened for eligibility. Inclusion criteria were: (1) age ≥18 years; (2) elective forefoot procedure (hallux valgus correction with or without metatarsal osteotomy, hallux rigidus surgery, or isolated metatarsalgia surgery); (3) absence of contraindications to local anesthetics or epinephrine; and (4) no prior surgery at the same operative site. Exclusion criteria comprised known allergy to amide local anesthetics or epinephrine, severe peripheral arterial disease or critical limb ischemia, uncontrolled cardiovascular disease and patient refusal of local anesthesia. The protocol was approved by the Institutional Ethics Committee, and all patients provided written informed consent prior to inclusion.

Standardized WALANT protocol

The WALANT protocol was standardized for all cases.

Anesthetic solution: A solution of 1% lidocaine with premixed epinephrine 1:200,000 was used without further dilution or buffering in the majority of patients. The total infiltrated volume ranged from 15 to 20 ml, adjusted to the extent of the planned surgical field.

Injection technique: Infiltration was performed with a 25–27 G needle to minimize injection discomfort. The initial injection was made perpendicular to the skin to raise a visible wheal, followed by subcutaneous fanning in the direction of the planned incisions. Infiltration extended from the dorsal first metatarsophalangeal joint to cover all anticipated incision sites and dissection planes, following the tumescent technique principles described by Lalonde[4].

Waiting time: A minimum waiting time of 30 minutes between the end of infiltration and skin incision was systematically observed to ensure optimal epinephrine-induced vasoconstriction and adequate lidocaine diffusion

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to deeper tissues. This interval is in line with prior evidence suggesting optimal hemostasis at approximately 25 minutes after epinephrine injection.

Intraoperative sedation: Intravenous sedation was available and administered upon patient or surgeon request. Agents included midazolam, propofol, or a combination, were used to maintain a calm, communicative, and cooperative patient. No opioids were used intraoperatively. No tourniquet was applied in any case.

Postoperative analgesia: All patients received a standardized written analgesic regimen at discharge, consisting of oral paracetamol 1 g every 6–8 hours and an oral nonsteroidal anti-inflammatory drug (ibuprofen 600 mg or equivalent) every 8 hours for 48–72 hours, with explicit instructions to take the medication proactively rather than waiting for significant pain.

Outcome measures

The following variables were recorded prospectively:

1) Intraoperative pain, assessed immediately after surgery using the NRS (0–10; 0 = no pain, 10 = worst imaginable pain).
2) Immediate postoperative pain at recovery room discharge (NRS).
3) Pain at 6 and 24 hours postoperatively (NRS), collected by standardized telephone follow-up or structured questionnaire.
4) Patient satisfaction evaluated with a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) across seven domains: minimal pain during surgery, adequate pain control at 6 hours, adequate pain control at 24 hours, satisfaction with the anesthetic technique, adequacy of preoperative information, recovery experience at 48 hours, and overall surgical experience.
5) Operative time, defined as the interval from skin incision to wound closure (minutes).
6) Intraoperative events, including anesthetic failure, need for supplemental block or conversion to general anesthesia, and significant intraoperative bleeding.
7) Postoperative events within 48 hours, including wound oozing, hematoma, reoperation, and emergency department visits.

Statistical analysis

Given the descriptive, hypothesis-generating design, only descriptive statistics were performed. Continuous variables are reported as mean ± standard deviation (SD) and range, whereas categorical variables are presented as absolute numbers and percentages. Satisfaction outcomes are reported as mean Likert scores and the proportion of patients selecting 'agree' or 'strongly agree' in each domain. Analyses were performed using standard statistical software. No formal sample size calculation was undertaken.

RESULTS

Patient demographics and indications

Thirty consecutive patients were included. Mean age was 65.2 ± 9.7 years (range 45–77), and 24 patients (80%) were female. Mean BMI was 27.2 ± 4.4 kg/m^2. Hallux valgus was the main indication (n = 17; 56.7%), followed by hallux rigidus (n = 5; 16.7%), combined hallux valgus with metatarsalgia (n = 4; 13.3%), and isolated metatarsalgia (n = 4; 13.3%). These data are summarized in *Table 1*.

Anesthetic protocol adherence and operative data

Almost all patients (96.7%) received preoperative intravenous midazolam as anxiolytic premedication. Intraoperative supplemental sedation was administered in 24 patients (80%): midazolam alone in 10 (33.3%), propofol alone in 5 (16.7%), and a combination in 7 (23.3%). Six patients (20%) required no intraoperative sedation and remained fully awake and comfortable. All patients were communicative and cooperative throughout surgery. Mean operative time was 32.3 ± 9.4 minutes (range 20–55). No tourniquet was used in any case.

Pain outcomes

Pain outcomes at each timepoint are presented in *Table 2*. Mean intraoperative NRS was 0.17 ± 0.38 (range 0–2), indicating near-complete analgesia during surgery. Immediate postoperative NRS at recovery room discharge was 0.23 ± 0.50 (range 0–3). At 6 hours, mean NRS was 1.47 ± 2.01 (median 1.0; range 0–9), and at 24 hours, 1.97 ± 1.90 (median 2.0; range 0–9).

Patient satisfaction

Satisfaction data are summarized in *Table 3*. Minimal pain during surgery was endorsed with 'agree' or 'strongly agree' by 29 patients (96.7%; mean score 4.50). Adequate pain control at 6 hours was reported by 80.0% (mean 4.10), decreasing to 43.3% at 24 hours (mean 3.52). Satisfaction with the anesthetic technique and the information received were endorsed by 63.3% (mean 3.97) and 56.7% (mean 3.76), respectively. Recovery at 48 hours was rated

Variable	n (%) or mean ± SD	Range
Age (years)	65.2 ± 9.7	45-77
Sex (female)	24 (80.0%)	-
BMI (kg/m^2)	27.2 ± 4.4	-
Hallux valgus	17 (56.7%)	-
Hallux rigidus	5 (16.7%)	-
Hallux valgus + metatarsalgia	4 (13.3%)	-
Isolated metatarsalgia	4 (13.3%)	-

Table 1. *Demographic data form.*

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Timepoint	Mean ± SD	Median	Range
Intraoperative (NRS 0-10)	0.17 ± 0.38	0	0-2
Immediate postoperative (recovery)	0.23 ± 0.50	0	0-3
6 hours postoperative	1.47 ± 2.01	1.0	0-9
24 hours postoperative	1.97 ± 1.90	2.0	0-9

Table 2. *Pain scores (NRS 0–10) at each timepoint.*

positively by 73.3% (mean 4.10), and overall surgical experience by 83.3% (mean 4.14).

Safety and early postoperative events

No intraoperative complications occurred. No patient required conversion to regional or general anesthesia, additional nerve block, or tourniquet application, and the surgical field was consistently judged satisfactory by the surgeon. Within 48 hours, nine patients (30%) experienced minor postoperative events: five (16.7%) attended the emergency department for wound oozing or blood-stained dressings requiring dressing change, three (10%) reported poorly controlled pain related to incomplete adherence to or understanding of the prescribed analgesic regimen, and one (3.3%) reported discomfort due to bandage tightness. No hematomas, infections, neurovascular injuries, or reoperations were recorded.

DISCUSSION

This prospective case series shows that WALANT anesthesia is a safe, effective, and well-accepted technique for elective forefoot surgery. The main findings are:

1) Near-complete intraoperative analgesia (mean NRS 0.17);
2) Very low immediate postoperative pain (NRS 0.23);
3) High overall patient satisfaction (83.3% 'agree/strongly agree');
4) Absence of major intraoperative or early postoperative complications.

Our results are in line with prior WALANT literature in the hand and forefoot. Lalonde et al. demonstrated the safety of lidocaine–epinephrine infiltration in over 3,000 hand and finger procedures, refuting longstanding concerns about digital ischemia[4]. The same pharmacological principles apply to the forefoot, which lacks end-arterial anatomy similar to digital arteries, supporting the safety of epinephrine use in this region. MacNeill and Mayich initially established the feasibility of wide-awake foot and ankle surgery[9], and Wright et al. showed that wide-awake forefoot surgery reduced pain and anxiety compared with general anesthesia; our intraoperative NRS values are comparable or even more favorable, likely reflecting strict adherence to infiltration volume, fine-gauge slow injection, and adequate waiting time[11].

Domain	Mean score	Agree/ strongly agree	% agree/ strongly agree
Minimal pain during surgery	4.50	29/30	96.7%
Adequate pain control at 6 hours	4.10	24/30	80.0%
Adequate pain control at 24 hours	3.52	13/30	43.3%
Satisfaction with anesthetic technique	3.97	19/30	63.3%

Table 3. *Patient satisfaction across seven domains (5-point Likert scale).*

The very high proportion of patients reporting minimal intraoperative pain (96.7%) compared with overall satisfaction (83.3%) suggests that analgesic performance of WALANT is perceived as excellent, even among patients with less optimal postoperative pain control[11]. This pattern, together with the decline in satisfaction at 24 hours, underscores the limited duration of lidocaine-based analgesia and highlights the importance of robust discharge instructions and proactive oral analgesia. Similar trends have been reported in other WALANT series in forefoot surgery. Future protocol refinements could explore the addition of longer-acting agents or adjuvants to extend postoperative analgesia, although their safety profile in the forefoot warrants specific investigation.

The 30% rate of minor postoperative wound events must be interpreted in context. All cases involved mild oozing or bandage-related symptoms, without hematoma, infection, or surgical reintervention. In WALANT hand surgery, mild postoperative oozing in the absence of a tourniquet is considered a physiological consequence of continuous perfusion and epinephrine washout rather than a complication. We propose that, in forefoot surgery, this phenomenon should similarly be regarded as an anticipated event that can be attenuated by structured preoperative education and clear written instructions, thereby reducing unnecessary emergency department visits.

An additional qualitative advantage of WALANT is the ability to obtain intraoperative feedback on toe motion and weightbearing, which may help optimize alignment and soft-tissue balance in hallux valgus and metatarsal procedures. Although not formally quantified in this study, this feature was appreciated by the operating surgeon and could translate into improved functional outcomes.

This study has limitations. The sample size is modest, limiting statistical power and generalizability. The absence of a control group precludes direct comparison with regional or general anesthesia; this gap is being addressed by an ongoing multicenter randomized trial comparing WALANT with popliteal sciatic block in elective forefoot surgery at our institution. Follow-up was restricted to 48 hours, so longer-term outcomes were not assessed, and the predominance of older, female patients may limit applicability to other populations. Finally, variability in

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intraoperative sedation regimens may have influenced subjective patient experience.

Despite these limitations, the present series provides a fully described, reproducible WALANT protocol for forefoot surgery and confirms its feasibility and acceptability outside specialized hand units. The simplicity of the protocol, without the need for an on-site anesthesiologist or complex anesthetic infrastructure, makes it particularly attractive for high-volume elective forefoot programs in resource-optimized settings.

CONCLUSION

WALANT anesthesia is a safe, effective, and well-tolerated technique for elective forefoot surgery, offering excellent intraoperative analgesia, low immediate postoperative pain, and high patient satisfaction without the need for tourniquet or regional block. Mild postoperative wound oozing in approximately one-third of patients appears to be an expected manifestation of tourniquet-free surgery rather than a complication and can be addressed through structured patient education and dressing management. This prospective series provides a pragmatic protocol and supports further comparative trials of WALANT versus regional anesthesia in forefoot surgery.

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