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Original Research Article

Indications and Early Outcomes of WALANT among Patients Undergoing Surgical Procedures at a Tertiary Care Hospital, Mwanza, Tanzania

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Abstract: ***Introduction:*** The concept of "Wide Awake Local Anesthesia No Tourniquet" (WALANT) technique is gaining popularity in the field of plastic, orthopedic and general surgery owing to its benefits of reduced cost, improved safety, improved patient satisfaction, avoiding costly preoperative tests, decreased operative time, reduced utilization of hospital resources and length of hospital stay. ***Objective:*** To determine indications for surgery and early outcomes of "Wide Awake Local Anesthesia No Tourniquet" among patients undergoing surgical procedures at Bugando Medical Centre (BMC). ***Method:*** This was a 4 months' prospective longitudinal study conducted from April to July 2023 involving 91 patients aged 12 years and above who underwent surgical procedures from plastic, orthopaedics and general surgery departments at Bugando Medical Centre. Structured questionnaire was used to obtain operative information and the Visual Analogue Scale (VAS) was used to obtain intra operative pain score. ***Results:*** The most common indication for using WALANT was surgeon's preference (65/91,70%). The most common procedure done was sloughectomy (16/91,17.6%) the least being colostomy placement (1/91, 1.1%). Intraoperative VAS score range from 0 to 4 with a mean of 1.1 (±0.39). (88/91, 97%) of the participants had no any complication post-operatively and the majority of the remaining few presented with tachycardia (2/91, 2.2%). The level of satisfaction was significant associated with the length of hospital stay having the p-value of 0.00. ***Conclusions:*** The WALANT technique can be performed as the best alternative type of anesthesia for both minor and selected major surgeries with minimal pain score, high patient's satisfaction rate, minimum risk of infection and significant reduced length of hospital stay.

Keywords: WALANT, indication, early outcome, visual analogue scale.

BACKGROUND

WALANT is a technique in which a solution made up of a proportional mixture of lignocaine, sodium bicarbonate and adrenaline is injected in a manner to obtain tumescence in the subcutaneous tissue /periosteum in order to allow surgeries to be done without using tourniquet while patient is fully awake. Tumescent means enough local anaesthesia to be visible and palpable wherever dissection or bone manipulation occurs [1]. Initially, it was performed for hand-based soft tissue procedures such as carpal tunnel or trigger finger releases but recent literature has shown that WALANT may be used for osseous procedures such as open reduction and internal fixation (ORIF) of distal radius fractures, carpal or metacarpal arthroplasty as well as more extensive soft tissue procedures such as spaghetti wrist reconstruction [2, 3]. It can further be used in other surgical procedures such as ganglion cyst excision, lipoma excision, wound debridement and keloid excision, all with minimal complications [4]. In Tanzania, WALANT was first introduced at Mwanza Bugando Medical centre (BMC) in the early 2021, and since then it has gain traction by many surgical specialities at our setting. But its indications and outcome have not been studied, and so the aim of this study was to analyse the usefulness of WALANT at our setting so as to have a clear surgical guideline on its indications and outcomes.

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MATERIALS AND METHODS

Study design and setting

This study was a prospective longitudinal study to determine the indications of WALANT and early outcomes among patients undergoing surgical procedures at Bugando Medical Centre which is a consultant, tertiary and teaching hospital for the Catholic University of Health and Allied Sciences-Bugando (CUHAS-Bugando). It is located in Mwanza City in the north-western zone of the United Republic of Tanzania. It is situated along the shore of Lake Victoria and has over 1100 bed capacity.

Study participants, Study Sample and Data collection

The study included all patients aged 12 years and above who underwent surgery in the main theatre, surgical clinic and other ward's bedside based procedures at BMC during the study period. Sample size was estimated using Yamane Taro formula with a total of 91 participants. Each patient was followed from a day of surgery up to 14 days postoperatively. Surgical wounds were inspected at the time of first dressing and then weekly up to 14 days' post-surgery. surgical site infection (SSI) was diagnosed as per the centre for disease control (CDC) guideline, it was identified to be present if any one of the following criteria was fulfilled; purulent drainage from the superficial incision, organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision plus at least one of the following signs or symptoms; pain or tenderness at the surgical site, localized swelling, erythema or heat.

Data Analysis

Data collected were entered into Microsoft excel and then exported to STATA version 15.0 software for analysis as per the objectives of the study. The results are presented into percentages/proportions for categorical variables whereas continuous variables are described as mean (± standard deviation) or median (inter quantile range) depending on the distribution of data. Chi-square test was used to asses for association of the depicted variables and the p value of less than 0.05 was termed to be significant.

Ethics

Ethical clearance was sought from the Joint CUHAS/ BMC research, ethic and review committee (CREC) before the commencement of the study. Enrolled participants were required to sign a written informed consent/assent for the study. Patient's privacy was assured and their information were collected under strictly confidentiality. The study did not in either way interfere with the decision of the attending doctor, and the patient refusal to consent or withdraw from the study did not jeopardize their access to medical care.

RESULTS

Demographics characteristics of the study participants

91 patients participated in this study with the mean age of 41 years. 56 of them were males and 35 were females. 68.1% had no comorbidities while 26.3% had comorbidities.

Common indications and technical aspects for WALANT

As shown in Table 1 below, the most common indication was chronic ulcer (11, 12%) followed by cut wound (10, 10.9 %,) and the least being rectal vesicle fistula (1, 1. 1%). Table 2 display its technical aspects.

Table 1: Indications for WALANT

Variable	Frequency (n)	Percentage (%)
Pre-operative diagnosis		
Chronic Ulcer	11	12.1
Cut Wound	10	11
Diabetic foot ulcer	6	6.6
Inguinal Hernia	6	6.6
Dysphagia	6	6.6
Soft Tissue Tumour	6	6.6
Abscess	5	5.5
Breast Lump	5	5.5
Lipoma	5	5.5
Ganglionic Cyst	4	4.4
Plantar Corn	4	4.4
Varicose Vein	4	4.4
Post Implant	3	3.3
Scalp Tumour	3	3.3
Sebaceous Cyst	3	3.3
Traumatic Wound	3	3.3
Pressure Sore Ulcer	2	2.2
Scald Burn	2	2.2
Scalp Lesion	2	2.2

Variable	Frequency (n)	Percentage (%)
Pre-operative diagnosis		
Foot Mass	2	2.2
Septic Ulcer	2	2.2
Recto-vesical fistula	1	1.1
Tendon Injury	1	1.1
Multiple Skin Tag	1	1.1
Foreign Body	1	1.1

Table 2: Technical aspects of WALANT

Variable	Frequency(n)	Percentage (%)
Infiltrated WALANT Solution		
Registrar	65	71.4
Resident	13	14.3
Specialist	12	13.2
Anaesthetist	01	01.1
Reason for selecting WALANT		
Surgeons' preference	64	70.3
Unfit for General Anaesthesia	10	11
Ambulatory surgery	17	18.7

Intra-operative pain score

In Majority of procedures, patients had no pain (83, 90%), followed by minimal pain (7, 8%). Minority of the patients had moderate pain (2, 2%). The intraoperative pain score of the study participants is shown in Figure 1 below. The VAS score ranged from 0 to 4 with a mean of 1.1 ± 0.39SD.

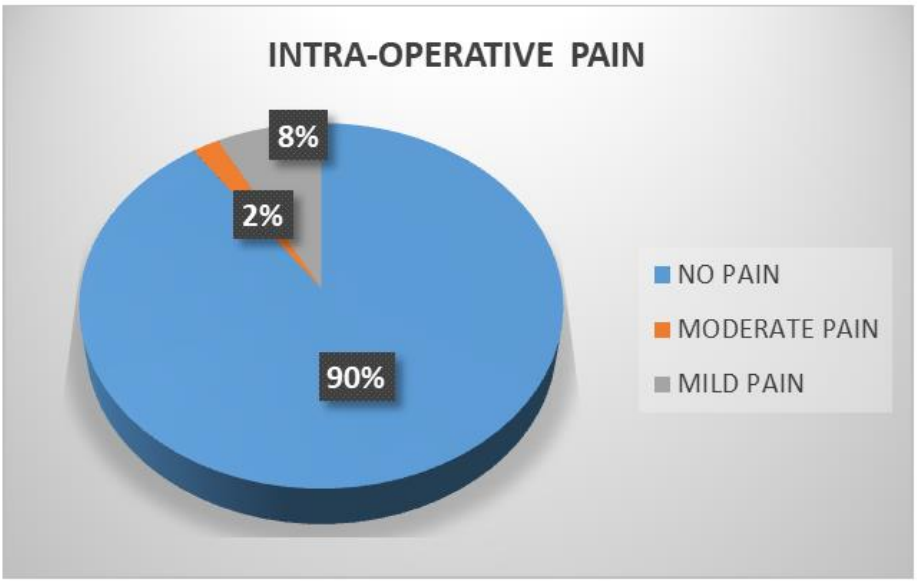

Figure 1: Showing intraoperative pain

Post-Operative WALANT omplication

Most of patients in this study had no complications (97%). Tachycardia and hypotension were the two common complications encountered by (2, 2.2%) and (1, 1.1%) respectively as shown in Figure 2 below. Most of the study participants had no post-operative infection after 2 weeks of follow-up (90, 98.1%). Only one patient (1.1%) developed a superficial surgical site infection within 2 weeks of follow-up. The majority of the patients (85, 93.4%) were satisfied with the procedure as shown in figure 3 below. Only a few patients (6, 6.6%) were unsatisfied with the WALANT technique. More than half of the patients (52, 57.1%) stayed in the hospital for 24 hours followed by 48 hours (17, 18.6%). Only two patients (2.1%) had a hospital stay of 2 weeks. Post-operative characteristics of the study participants are shown in Table 3 below.

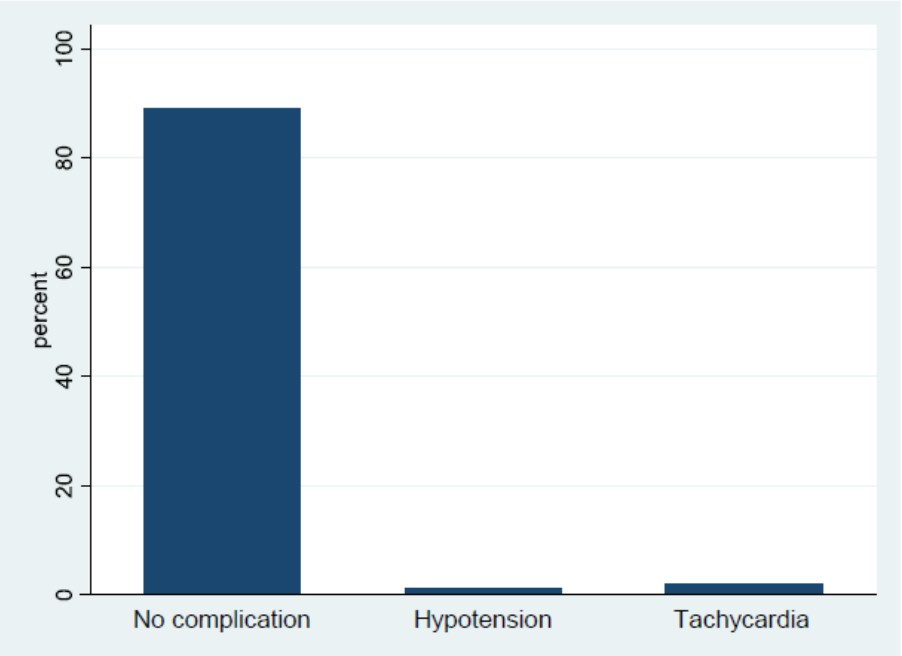

Figure 2: Post-operative WALANT complications among the study participant

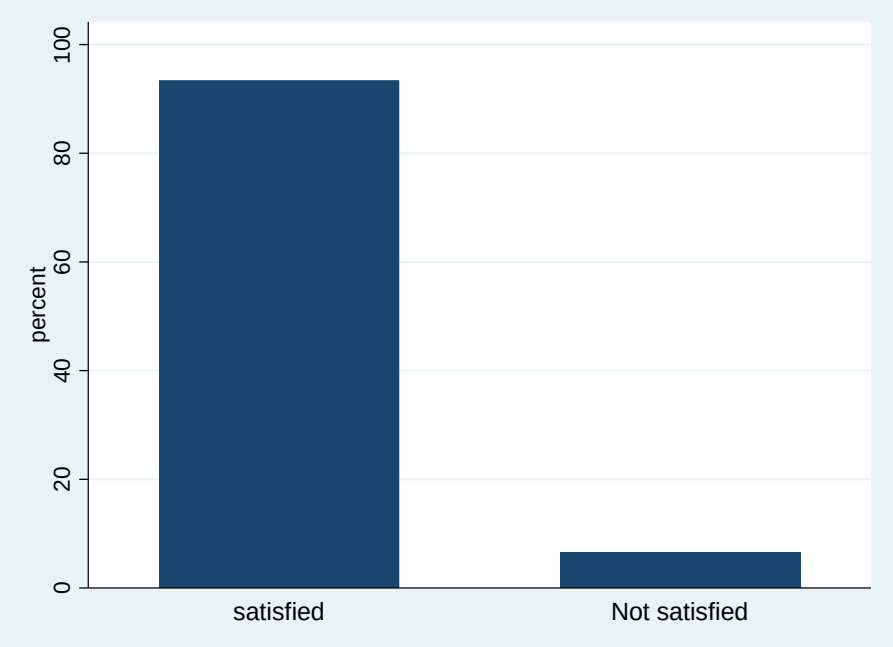

Figure 3: Level of satisfaction of the study participants

Table 3: Post-operative characteristics of the study participants

Variable	Frequency(n)	Percentage (%)
Post-operative infection		
No infection	90	98.9
Superficial infection	1	1.1
Length of hospital stay		
6 hours	13	14.3
1 day	52	57.1
2 days	17	18.7
1 week	5	5.5
2 weeks	2	2.2

Factors associated with the level of satisfaction among the study participants.

Patients with shorter duration of hospital stay post-surgery were more likely to be satisfied as compared to their counterpart. Consider Table 4 below.

Table 4: Factors associated with patient's satisfaction

Patients' characteristics	Satisfaction		Chi-square	
	Yes n (%)	No n (%)	$\chi 2$	p-value
Personnel				
Register	63(96.9)	2 (3.0)	7.170	0.065
Resident	10(76.9)	3(23.1)		
Specialist	11(91.6)	1(8.3)		
Anaesthetist	1(100)	0(0)		
Duration of surgery				
<30 mins	9 (100)	0(0.0)	0.7050	0.401
>30 mins	76 (92.7)	6(7.32)		
Length of hospital stay				
6 hours	13 (100)	0(0.0)	29.8164	0.000
1 day	49(94.2)	3(5.7)		
2 days	16(94.1)	1(5.9)		
1 week	5(100)	0(0.0)		
2 weeks	0(0.0)	2(100)		

DISCUSSION

Since its introduction, WALANT technique has gain popularity as an essential anaesthetic technique with reduced morbidities related to general and other anaesthesia modalities [5]. More than one-third of this study participants had comorbidities, diabetic mellitus being the most prevalent with no untoward experiences both during and after the surgical procedure. The same observation was reported in another study of which more than half of its participants had an associated comorbidity, however they fared well throughout the perioperative period [6]. These observations support the utility of WALANT technique as a safe and most practical option for older and other frail patients. The study has shown more than one-third of the WALANT procedures were conducted in the main theatre as there was no particular room specifically designated for the task, this observation is different from other studies where most of the procedures are reported to be conducted in the WALANT room [4, 7]. Research has indicated that; utilizing the basic procedure room for WALANT procedures is a highly effective and cost-efficient alternative to the normal traditional operating rooms [4]. WALANT was initially employed for plastic surgeries but now it has found its way into other surgical conditions and hence expanding its applications/indications [8]. This study has found WALANT to be useful in varieties of procedures like in lipoma excision, debridement, ganglionic cyst excision, wound debridement, tendon repair, and advancement flap. This is similar to a study done in one of Ghana tertiary hospital of which procedures like ganglion cyst excision, lipoma excision, wound debridement, keloid excision, tendon repair, and advancement flap were all done under WALANT with no complications reported [4].

Interestingly, a significant number of vital procedures in this study including colostomy creation and gastrostomy feeding tube placements were successfully done under WALANT with no pain or complications reported during and after surgery. One of the patient for colostomy had a rectal vesicle fistula with severe anaemia and electrolyte imbalances rendering him unfit for general anaesthesia. Gastrostomy feeding tubes were also successfully inserted in elderly patients with stage 4 oesophageal and mandibular cancer. In this study; surgeon's personal preferences played a significant role in the execution of the WALANT technique similar to the observation in Turkey where surgeons prefers WALANT technique because it allows them to engage patients in activities such as flexing and extending the hand during surgery, thus preventing an iatrogenic tendon injuries [9]. Furthermore, a number of participants in this study underwent ambulatory surgeries which then highlights the effectiveness of utilizing the WALANT technique as observed in one of the United Kingdom's (UK's) one-stop clinic [10].

Another study found most of patients WALANT technique to be less painful than a dental procedure [11], demonstrating its efficacy in reducing intraoperative pain and the need for additional anaesthesia during surgery. The achievement of low pain scores can be attributed to several techniques including precise injection, distracting the patient, stabilizing the syringe, pausing after the first injection and adrenaline use which increases the half-life of lignocaine for more than four hours, the use of bicarbonate buffers the acidic nature of lignocaine [1, 12, 13].

Our analysis also included a thorough examination of post-operative complications arising

from the use of the WALANT technique., the study observed tachycardia in 2% of participants' post-surgery which resolved spontaneously 1 hour after surgery without any medication. Similarly, another study revealed sinus tachycardia in a mere 2% of patients with heart disease which also resolved without medication [12], therefore, it is reasonable to assume that the tachycardia experienced by two patients might have been attributed to anxiety caused by their fear of being awake.

The WALANT's effects were also analysed in relation to sterility. The study found that only one participant reported a superficial surgical site infection, indicating a low risk of infection. One case study describes a patient with HIV stage 4 and severe anaemia who underwent colostomy using the WALANT technique, the patient developed a superficial surgical site infection 14 days after the surgery. The infection was treated with oral antibiotics and daily dressing. Poor colostomy care might have caused the infection due to surgical wound soiling. It is crucial to note that Avoricani *et al.*, [14] reported no infections 14 days following surgery with a minimal rate of 0.37% at 30 days in only one case of delayed flexor tendon repair.

Studying patient satisfaction levels after surgery is crucial for surgeons and based on the findings in our study; the respondents conveyed a notable degree of contentment. Several studies have indicated that patients are delighted with wide-awake local anaesthesia [6, 15-17]. A study conducted in South Africa found that every patient chose to undergo WALANT when given the option for re-operation. Ki Lee *et al.*, [15] found that patients who underwent WALANT for hand procedures were significantly more satisfied with surgery than those who received conventional anaesthesia. Xing and Tang [18] reported that 96% of wide-awake patients who underwent flap harvest and transfer on hand would choose WALANT again, Likewise; Davison *et al.*, [17] found that 93% of wide-awake patients undergoing carpal tunnel release would choose WALANT for future procedures. All of these studies have inveterate that the use of WALANT technique is associated with a favourable impact on patient satisfaction. Furthermore, the level of satisfaction to WALANT was highly associated with length of patient's hospital stay, those with short length of stay were more satisfied with WALANT than those who stayed longer. Similarly a study by Waqaar *et al.*, [19] found the increased length of stay in hospital is associated with lower odds of patient satisfaction and decreased likelihood of recommending the hospital to others [19]. The WALANT technique has then demonstrated to not only reduce the length of hospital stay, but also to reduce the risk for nosocomial infection and by doing so affecting the general bio-psycho social wellbeing of the patient.

CONCLUSION

This study has illustrated WALANT to be a safe and effective alternative to general anaesthesia for both minor and selected major surgeries. Additionally, it has proven to be effective in pain management, increase affordability to most of the basic surgical procedures as well as reduced hospital stay thereby enhancing levels of satisfaction among surgical patients.

Ethical consideration: Ethical clearance to conduct this work was sought from the relevant joint research and ethical committee which also approved for it to be published.

Competing interests: None

Funding: None

Author's contributions: AR, SJ & VK conceptualized the original research, data collection was done by AR and SJ. SJ and AR wrote the first manuscript as reviewed by VK, FT and RS. All authors approved for the final submission.

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