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Tirunelveli Experience of Wide-Awake Local Anesthesia No Tourniquet (WALANT) Hand Surgery

Dr SV Akshay Kumar[1], Dr S Venkatesh Babu[2]

[1]MBBS, Junior Resident, Department of Orthopaedics & Trauma Surgery, Sri Sakthi Hospital, Tirunelveli, Tamilnadu, India 627 005
[2]MB BS., MCh Orth., MBA., FRCS., FACS, Consultant Orthopaedic Surgeon and Head of the Department, Department of Orthopaedics & Trauma Surgery Sri Sakthi Hospital, Tirunelveli, Tamilnadu, India 627 005

Abstract:
We are presenting our experience with12 Hand Surgical Patients treated with the WALANT principle (Wide-awake Local Anesthesia No Tourniquet) and validate the benefits of this brilliant technique during the COVID Pandemic in a less resourced region of India.
These Hand Challenges were mainly Trauma, which was successfully treated by the Senior author using the WALANT standard. The results had revealed big satisfaction in all the patients and happiness to the surgeons.

Keywords: WALANT, Hand Surgery, Wide-awake surgery, Local anaesthesia, Tourniquet

Conflict of Interest: None

Key Points:
Question: How can we successfully provide Hand Surgical Care in a less resourced centre during COVID Pandemic?
Findings: In this clinical study, which included 12 patients, Wide-awake Local Anesthesia No Tourniquet (WALANT) Principle was adopted during the challenged time. All the patients and the surgeons reported excellent outcomes and immense satisfaction.
Meaning: In COVID pandemic and also in other demanding situations the use of WALANT Principle is advocated in Hand Surgery.

Introduction:

Modern Hand Surgery is an innovative field that is skillful, safe and is associated with high patient satisfaction. WALANT- Wide-awake Local Anesthesia No Tourniquet had appeared as an alternative technique in upper limb surgery to the traditional application of tourniquet under general or regional anaesthesia. In the year 2005, Canadian Plastic and Hand Surgical Professor Don Lalonde first introduced the WALANT Principle and reduced surgical waiting time . When he formally projected this model, the surgical mankind had adopted this pleasant concept and it is the method of Hand Surgery in

many parts of the world today[11,13,15]. The exclusion of sedation in this practice makes it possible to perform more procedures in an ambulatory setting rather depending on general anesthesia which is only possible in the operating room. Additionally, the use of WALANT has led to decreased costs, enhanced patient safety and improved surgical outcomes.[4,6,12,15,19,23]

WALANT is a surgical technique that uses local anesthetic and hemostatic agents to create conditions appropriate for hand surgery without sedation and tourniquet. It can be performed in the emergency room, operating theatre or in hand clinic to treat conditions commonly affecting the hand. Many Clinical studies have confirmed this technique's massive amount of benefits, including increased patient safety and access to surgical care [1,3,6,11,18,19,20] Recent evidences, while comparing WALANT with General anaesthesia taking the following factors like sterility, patient's anxiety, Pain control, cost, complications and patient satisfaction are equal or better[4].In the COVID 19 Pandemic period, many studies have confirmed that WALANT had offered an alternative option avoiding general anaesthesia and intubation [11,19] and also more advantages have been noted in WALANT including less needed resources[1,2] This presentation discusses the indications, physiology, technique, and clinical significance of the WALANT technique for hand surgery .This also explains the benefits of WALANT during the COVID Pandemic in a less resourced region of India.

In determining hand surgery outcomes, there are specific challenges in addressing the functional, emotional, aesthetic and psychological components of the disease. These elements must be considered while treating the patients [5,8,9,10]

There are many advocacies including the British Association of Plastic Reconstructive and Aesthetic Surgeons (BAPRAS) and the British Society for Surgery of the Hand (BSSH) for the usage of WALANT during the pandemic, considering that safety and the medical resources may be preserved [2, 3,4,19, 22]

In the recent study of 2023, WALANT had proved it is safe and effective for use in local and regional soft tissue flap surgery performed in demanding Hand situations. The results had demonstrated positive outcomes and superior recovery in all patients [1,12]

Methodology:

From January 2021 to December 2022, we had selected 12 Patients based on guidelines[2,3,12,19,20] with Hand Surgical Challenges mainly Trauma. The senior author successfully treated patients using the WALANT Technique. The patients were followed-up for two years and are presented here.

We used WALANT as per principles [2,3,12,19 ,20] with lidocaine injection after the test dose to decrease pain and epinephrine to minimize bleeding. Typically the Injections were administered 30 min before surgery . The patient awaken during the procedure. We used an anesthetic solution consisting of 80 ml normal saline, 20 ml of 2% Lidocaine (safe range of 7mg/kg)[22], 10 ml sodium bicarbonate (8.4%) and 1 ml of 1:1000 epinephrine [2,4,6 ,16,20] and an additional 10 ml of bupivacaine (2mg/Kg)[22] in longer surgeries like Distal Radius fixation[16]

As explained previously, epinephrine was used in combination with the Lidocaine to achieve hemostasis. This amalgamation establishes a unique effect by activating alpha-adrenergic receptors which in turn causes vasoconstriction of blood vessels. This vasoconstriction also delays lidocaine's absorption, thereby prolonging analgesia and improving safety profile. Epinephrine also causes hemostasis via platelet aggregation[3]

WALANT is safer when sodium bicarbonate is added to the Injections.This is because, it helps patients to reduce their injection pain. It also enhances the anaesthetic effect of lidocaine and reduces the risk of lidocaine toxicity and postoperative complications[4]. A unique pattern of patient distribution was observed (Table 1)

Patients presenting time distribution	Age distribution	Sex distribution	Diseases/Trauma	Acceptance by patients
11 AM – 10 PM	21-54 Years	Male > Female	Trauma > Diseases	Good >Satisfactory

Table 1. The Pattern of Hand Surgical Patients in the Study

Choosing the correct angle for needle insertion is critical in local anesthetic techniques. Needles of 27 Gauge (40mm) were used[22] and oriented at 90 degrees to the skin were shown to be significantly less painful than those with needles oriented at 45^{o}. Injecting the solution under the dermis (subdermal) produces less pain than intradermal injections. There should always be at least 5 mm of firm palpable local anesthesia in the skin ahead of the needle tip so that the needle tip never penetrates an area that is not anesthetized except for the first pierce of the needle penetration.A slow injection of lidocaine allowed the needle to reach the tip**.** [20, 21]

We used the WALANT Principle for significant types of hand surgery with Informed Consent as shown in Table 2. The Anatomical regions included the hands and wrists.

The Types of Local Blocks been used in our patients were the Median nerve wrist block, Ulnar nerve wrist block, Radial Nerve wrist block and Digital nerve blocks. The required dose (Carpal Tunnel Release 10 ml, Trigger Finger Surgery 4 ml, Metacarpal fracture surgery 20 ml, Distal radius fracture surgery 20 ml) was injected based on the principles of WALANT. Most surgeries were performed in the Emergency room. The patients' limbs were prepared in a standard fashion and the infiltration was performed 30 minutes before surgery. In cases of trauma, we performed surgery within 15 minutes of infiltration. All surgeries were completed in one hour duration except for distal radius fracture fixation, which took 25 minutes more at operating theatre. After successful surgeries, all patients were followed up on day one, fourth day, seventh day for dressings and on the tenth day for suture removal. Subsequently, they were seen at two weeks, four weeks and eight weeks postoperatively. Then, every three months for two years.

The outcomes were measured using general and disease specific techniques such as the Visual Analogue Scale, Carpal Tunnel Questionnaire, Michigan Hand Questionnaire and Quick DASH PROM (Patient Reported Outcome Measure)[5]

Results:

Our study included 12 patients from different age groups (Table 2), all of whom were highly understandable and cooperative. Surgical procedures were systematically performed according to the WALANT Principles.

There were no infections or complications during or after the surgery. Advantages included less need for preoperative evaluation and testing for anesthesia approval, eliminating the risk of general anesthesia, reducing additional staff, reducing costs and producing less waste. Their follow-up was good and

significant fulfillment was noted. Our Study demonstrated excellent patient satisfaction and outcomes. Many happier patients and surgeons in this special way of doing Hand surgeries been recorded in our study

Discussion:

Traditionally, most wrist and hand surgeries are performed under a tourniquet to ensure bloodless and clean operative ground. However extended tourniquets have led to considerable discomfort in patients and their use necessitates the use of regional anaesthesia to address the discomfort[16]. Today, the WALANT technique has clanged the scenario[21] and is being used significantly to treat people with Trigger finger, Carpal tunnel syndrome, Hand Injuries, K wire fixation , Distal Radius fracture fixation, Wrist arthroscopy, Trapiezectomy, Carpal prosthesis surgery, Tumour excision in Hand, De Quervain's tenosynovitis, other forms of tendinitis and many more extended indications [15,16,17.18,19,20,21,22,23]

Patient	Age	Sex	Health Challenge	Complications	Outcome
1	36	FM	Trigger Finger	Nil	Good
2	22	M	Trauma	Nil	Good
3	29	FM	Trauma	Nil	Good
4	52	M	Trigger Finger	Nil	Good
5	21	M	Trauma	Nil	Good
6	30	M	Trauma	Nil	Good
7	52	FM	Trauma / Right Distal Radius #	Nil	Good
8	42	M	CTS	Nil	Good
9	36	FM	CTS	Nil	Good
10	21	M	Trauma	Nil	Good
11	28	FM	Trauma	Nil	Good
12	54	M	Trigger Finger	Nil	Good

Table 2. The Age, Sex , Types and Outcome of Hand Surgeries in the Study

With the introduction of WALANT the patient satisfaction has increased significantly. In the past, the classic triad was proposed for measuring quality in health care, namely, structure, process, and outcome. Outcomes in surgery have typically been explained by the "five Ds"–death, disability, dissatisfaction, disease and discomfort. However, the structure and smoothness of the process will influences the outcome. In the current era of evidence-based medicine, there is increasing interest in including the effect of surgery on health status, functional status, and quality of life is growing nowadays and the surgical outcomes also fits this description. WALANT provides excellent outcomes with significant patient safety and the ability to perform their daily functions leading to happiness in the oper-

ting hand surgical team [4,5,8,9,10 ,23]

In 2015, surgeons from India presented the wide awake local anesthesia no tourniquet (WALANT) technique for leprosy tendon transfers..Their work summarized the first 18 months of experience and described 5 of their operations. They found that WALANT provides effective anesthesia with good visibility for leprosy tendon transfers. WALANT permitted economically disadvantaged leprosy patients to undergo surgery. All of the leprosy patients who had undergone WALANT tendon transfers in this series liked the same technique for their next tendon transfers.[18] Also the efficacy of WALANT in the surgical management of Distal Radius fracture has been validated in India[16]

The implementation of the wide-awake local anesthetic no tourniquet (WALANT) approach for surgical procedures in Cyprus has been proven to result in significant cost savings. In addition, in the United Kingdom, the implementation of the WALANT has led to shorter waiting times for hand surgical procedures, again cost savings for the National Health Service and higher patient satisfaction rates.Patient education is a prerequisite for WALANT surgery in both the countries. It increases the satisfaction rate among patients and enhances the patient-surgeon relationship. Patients need to know that they can actively participate in a procedure, because moving their hands during the procedure can improve the outcome[13]

Minimally invasive local anesthesia eliminates the need for sedation and proximal nerve blocks as well as all of their risks, costs and inconveniences. It has facilitated advances in procedures such as hand fracture reduction, tendon repair, and tendon transfer by allowing the surgeon to observe cooperative patient's active movement during the surgery.This has improved the patient's experience with simple hand operations such as Carpal tunnel release.

Since the introduction and development of WALANT in South America, specifically in Brazil, where thousands of cases have been treated using this technique. Surgeons began with smaller procedures such as Trigger fingers and Carpal tunnels, which were easily implemented. There has been an increase in the number of more complex procedures, such as flexor tenolysis or tendon transfers, in which patient cooperation can help improve results.[7]

Clinic-based hand surgery performed under local anesthetia has been steadily and increasingly performed in Canada over the last 50 years. The drive for its development stems from the Canadian health care system's finite funding structure and resources. These benefits have extended far beyond the costs and garbage reduction. This has greatly improved patient care by increasing comfort and safety with the elimination of sedation, the tourniquets and night surgery and by improving access to care. This article details the rationale and development of clinic-based hand surgery from a Canadian perspective and provides tips and strategies for other centers looking to implement a similar clinic.[14]

WALANT is a promising development for surgeons and patients owing to its improved outcomes in hand and wrist surgeries. No anticoagulants were stopped pre-operatively[22].Surgeons have mostly used the WALANT for flexor and extensor tendon repair, tenolysis, and tendon transfer. Its application in Korea has strengthened surgeons' confidence in tendon repair integrity, gliding ability, and the transfer of tension through direct observation and patient feedback. The surgeons did not use the WALANT for complicated tenolysis or in secondary surgeries in previously severe injury situations. Similarly, the procedure has proven unsuitable for incomplete or complete digit replantation.[15]

WALANT eases the timely delivery of emergency surgical care in remote and less resourced regions[4].It is a valuable system for common plastic surgeries of the upper limb with much safety, patient satisfaction, cost effective and less complications[2,4]

Conclusions:

This WALANT technique has proven valuable to both patients and surgeons in terms of patient satisfaction and provides considerable healthcare savings at centres with fewer resources. During the COVID-19 Pandemic, WALANT provided an opportunity for patients to receive surgical care without requiring significant time in an emergency. Additionally, it decreases the exposure between patients, hospital, and staff as it was performed outside the operating room. As its application continues to grow, current literature supports positive outcomes. Our Study had proven the said benefits of WALANT well and we are much happy to recommend this safety principle to all hospitals during demanding periods.

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