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PERSPECTIVE

WALANT (wide-awake local anaesthesia no tourniquet) and the East African surgical burden: A replicable training workshop in Eldoret, Kenya

Short title – Eldoret, Kenya: WALANT training workshop

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Abstract

Wide Awake Local Anesthesia No Tourniquet is a cost-effective anesthetic alternative that holds the potential to increase access to affordable and effective surgery. This surgical innovation was popularized by American hand surgeons who performed procedures successfully in less time, using less resources, with low infection rates and pain self-reports, which has since been validated with follow-up studies (4; 7; 15). This manuscript documents the impact of WALANT and presents a framework for educating health professionals on the innovation by reviewing the methods of a surgical workshop held in Eldoret, Kenya. It finally encourages the dissemination of WALANT training, since the technique has presented itself as a helpful tool in the efforts to improve access to safe and affordable surgery in East Africa.

Keywords: WALANT, local anaesthesia, affordable surgery, cost-effective innovation, Kenya

Introduction

WALANT is a burgeoning surgical innovation in the world. The extended acronym, Wide Awake Local Anesthesia No Tourniquet, indicates its method, but not its import. During the height of the COVID-19 pandemic, operating rooms were repurposed to accommodate COVID patients, causing delays in all forms of surgical care. In the United States, a 48% decrease in surgical procedure volume during the first declared month of the pandemic was reported (10). But resourceful hand surgeons still completed their operations through the discovery and practice of WALANT, a local anesthetic method, which could be performed in minor operating rooms. Contemporary anecdotal reports claimed comparable infection rates and increased efficiency to general anesthesia methods. De Boccard et al. 2021 confirmed the claims, reporting that WALANT hand operations could be 17.5-33% more time-efficient in main operating rooms. Outside the theatre, research also verified low infection rates- 0.37% on 30-day surgical site infection for 265 hand and upper extremity patients (4). And concerns about vasoconstrictive-induced ischemia and tissue necrosis were discredited, thereby approving adrenaline mixtures for digital operations (8). Surgeons that became familiar with the WALANT technique began to share with other practitioners. Today, the WALANT academy includes plastic, orthopedic, and general surgeons.

Following the pandemic, WALANT has been used in the aftermath. While many hospitals were forced to reduce their budgets, the WALANT technique presented a surgical option that saved resources by using minor operating theaters. Bismil et al. 2012⁵ reported that basic orthopedic surgeries using WALANT in a minor procedure room

Eldoret, Kenya: WALANT training workshop



took, on average, 45 minutes to complete compared to 3.5 hours in the main OR. The time efficiency gave rise to a resource and cost efficiency. Compared to main OR surgery, carpal tunnel release could be done at 15% of the cost with WALANT in a minor operating room. Likewise, A1 pulley release could be done at 30% the cost (15). The financial savings went together with reducing equipment usage. From October 2014 to December 2016, a review of 1099 WALANT hand surgeries found 2.8 tons less waste than procedures with standard hand surgery equipment in a main OR (7).

During procedures, WALANT has allowed for intraoperative patient interaction, which has anecdotally improved surgical results. Surgeons can educate patients on self-care during procedures and patients can offer autonomous mechanical feedback during repairs with varying functional outcomes. In addition, the pain-free injection and experience has formidably improved, thereby improving patients' confidence in the technique (16).

As the WALANT technique has gained popularity, some of its applications have become more ambitious. Distal radius fracture plating repairs under WALANT have seen no significant difference in surgical outcomes, post-op complications, and patient anxiety compared to main OR procedures with general anesthesia (18). Likewise, Niempoog et al. 2021¹¹ has offered a clavicle fracture fixation case report that observed zero post-operative complications. And a broader review of clavicular fracture plating operations found zero or low pain ratings from patients (3). Outside the orthopedic discipline, Pandya et al. 2022¹³ recorded a successful male mastectomy with a highly comorbid patient.

A review of relevant literature reveals that WALANT has been attempted and researched across North and some of South America, Europe, and Southeast Asia, but there has been little contribution from Africa. This research deficit, however, does not reflect the status of WALANT in the continent.

Due to its practical and resource-effective nature, East African surgeons have sought to disseminate WALANT training throughout multiple countries via workshops. This report describes the efforts of East African WALANT educators and provides a replicable model for a training workshop to be used in other African regions

Method: The WALANT training workshop framework

To disseminate the WALANT method, training workshops have proved to be an effective, replicable process. The first step is to gain approval from a host hospital or school. Next, local hospital staff (surgeons, anesthesiologists, general practitioners, residents, nurses, etc.) must be informed to approximate the number of attendees. This information will determine the lecturing location and amount of WALANT materials required. On the workshop day, the effective format includes education, observation, and practice with the latter two's order being interchangeable. Education requires lectures by regional practitioners and international experts to explain the use and impact of WALANT. At the end of the workshop, the didactic thoughts are fleshed out as attendees observe WALANT in practice by the regional practitioners on patients previously scheduled. After this event, attendees are instructed as they mix and inject WALANT among themselves (most often using one another's digits). In addition, a pre- and post-assessment test act as bookends to the day. Finally, the attendees gather for closing remarks and CE or certificate distribution.

Results: The East African WALANT training experience

Education

Via the coordination of Dr. Andrew Wandera, Moi Teaching and Referral Hospital in Eldoret, Kenya, invited the lead author of this article, Dr. Pankaj Jani, to lead a WALANT workshop. In addition to Dr. Donald Lalonde's virtual attendance from Newfoundland, Canada, Dr. Victor Lusweti from Eldoret and Dr. Eliud Aluvaala from Machakos, Kenya joined as local lecturers. Roughly 50 attendees were welcomed and sat through the morning lectures, which explored the foundations of WALANT. These talks were given by Dr. Jani, Dr. Aluvaala, and Dr. Lusweti, respectively. A short break preceded the presentation by Dr. Donald Lalonde, who discussed his WALANT practice in addition to its international scope (at other workshops, Dr. Lalonde has been joined online by faculty from Malaysia, Turkey, and Taiwan). The following section denotes the key points derived from this didactic workshop portion.



WALANT educational content

Dr. Pankaj Jani argued that WALANT can increase accessibility to surgery because of its cost-effectiveness and the wide availability of its materials. During this lecture, Dr. Jani shared the savings reported by Coast General Referral Hospital in Mombasa, Kenya. This hospital reported the average savings per WALANT case to be 10,000 Kenyan Shillings (~66 USD). From January 2021 to March of 2022, hospital records indicate total savings were 3,850,500 shillings (~255,000 USD) in 294 cases. Dr. Eliud Aluvaala, who followed Dr. Jani, made the point that reports are vital in assessing WALANT's impact. He then explained that establishing a WALANT procedure room can facilitate these reports. After campaigning at the Machakos Level 5 Hospital, Dr. Aluvaala established one such area, which utilized a minor procedure room, minimal operating instruments, a headlight, supplies for field sterility, and two nurses as staff. After this, Dr. Lusweti gave the step-by-step WALANT preparation instructions. When Dr. Lalonde presented, he referenced the advances in surgical procedures successfully attempted with WALANT and affirmed Dr. Lusweti regarding the best methodology for WALANT, which is explained in the following two paragraphs.

WALANT is a mixture of lidocaine, adrenaline, bicarbonate, and saline. The other materials required for concoction and injection include 20cc and 5cc syringes, needles- 25 gauge and above, sharps disposal, and a hospital bowl for mixing. To begin, physicians must determine a patient's kg weight and approximate the required solution volume for the procedure. The patient's kg weight is used to calculate lidocaine dosage with a 7mg/kg ratio. Then, the 8.4% bicarbonate is determined with a ratio of 1 cc per 10cc (or 10%) of estimated total solution. Finally, .5cc of adrenaline is added along with the saline required for the total solution volume. For clarity, consider the following example: a 70kg patient undergoes a procedure that requires 200ml of total solution volume. The patient would need 490mg of lidocaine ($70\text{kg} \times 7\text{mg}$), which is about 50ml 1% or 25ml 2% lidocaine solution. Then, 20ml of 8.4% bicarbonate would be added ($20\text{ml} = 10\%$ of 200ml). Finally, add .5ml adrenaline along with the saline required to make for a total solution volume of 200ml, which would be around 150ml (or 175ml if 2% lidocaine is used).

Once the solution is mixed, it is ready for injection. A 2cm distance should be marked surrounding the surgical site. Injections should flood the tissue to produce a tumescent area, i.e. having a firm, swollen appearance. The only pain for the patient should be the initial injection, and this can be minimized with a higher gauge needle. After the first, all following injections should be delivered at angles within the growing tumescent area, ensuring a numbness to the needle point. For the entire surgical site to become numb, providers must wait 30 minutes after injection to begin their procedure. This technique, like all others, is learned with observation and practice, which is why such portions exist in the workshop here explained.

Observation

There were 3 patients scheduled for WALANT procedures, all with farm equipment-related trauma. All attendees observed the regional instructors as WALANT was injected in each patient according to the methodology previously discussed. In this case, WALANT was used for pain-free cleaning and dressing.

Practice

After the observation period, attendees were encouraged to try the WALANT technique for themselves. As instructed, the solution was mixed and then injected into the fingers of volunteers. Attendees experienced the minimal pain and enduring numbness associated with WALANT. In this case, the practice took place after the observation, but the order of these facets should be determined according to patient availability, which has historically meant that observation takes place last.

Discussion

This review proposes WALANT's potential as an impactful surgical innovation and promotes the workshop initiative for its dissemination. WALANT research has revealed the innovation's cost-effective, resource-efficient, and patient experience-oriented nature. This last characteristic is what distinguishes WALANT from other local anesthetics. Compare it to the well-known Lidocaine Adrenaline combination (LAC), also known as "Jungle Juice"



(12). Both avoid the pain associated with tourniquet use and both are cost-effective anesthetic methods. However, WALANT incorporates bicarbonate to counteract lidocaine's acidity and its associated discomfort (16). Given the minimal pain experience, patients trust the WALANT method. They have also appreciated the technique's strengths of quick turnover and resource efficiency. And it is what patients want that ultimately determines what procedures are done. A notable example of this truism was the large-scale transition from laparotomy to minimally invasive (MI) procedures in the world of general surgery. Much like the start of MI surgery, the approval of patients has opened the door for more ambitious procedures to be attempted with WALANT. It has established ground in general anesthesia territory by completing the same procedures with comparable results (1; 18). And beyond the reach of GA, WALANT has provided a surgical option to some highly comorbid patients (2; 13). Its approval in HIC contexts verifies its legitimacy among the most privileged patients, but its true potential for great impact would be realized in LMICs. The estimated surgical output of LMICs is less than 900 per 100,000 people, while the proposed Lancet Commission goal is 5,000 (14; 17). Surgical innovations that are cost-effective and simple to learn are required to meet this need. The WALANT technique fulfills these requirements and therefore has the potential to improve access to surgery where the burden is great. Therefore, educating health professionals about WALANT is a viable path forward to combatting the surgical deficit in LMICs. The success in knowledge transfer of similar surgical workshops supports this WALANT initiative (6; 9). But more important than the knowledge transfer is the proof that this innovation is making a difference. That is why the authors of this article propose that the next generation of workshops include gathering hospital data related to the purported effects of WALANT. For example, in a set timeframe before and after the workshop, is there any evidence of improved patient turnover? This evidence-based review must accompany the educational efforts to verify whether WALANT is an effective weapon in the fight against the East African surgical burden.

Conclusion

Across multiple conditions, WALANT has been shown to be a viable, highly cost-effective alternative to traditional anesthesia techniques. Expanded use of the WALANT approach holds the potential to improve access to safe and effective surgical care across East Africa. A structured approach to educating East African surgeons through the workshop model appears to be an effective means of increasing adoption throughout the region.

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