Scientific Research Publishing

Open Journal of Orthopedics, 2025, 15(5), 185-191
https://www.scirp.org/journal/ojo
ISSN Online: 2164-3016
ISSN Print: 2164-3008

Results of Surgical Treatment of Distal Radius Fractures under the Walant Anesthesia Technique: A Report of 12 Cases

Sidime Sory[1], Alpha Mamadou Felah Diallo[1], Camara Tafsir[1], Aboud Amira[1], Boye Koivogui[1], Barry Alhassane[1], Alioune Badara Diouf[2], Lamah Leopold[1]

[1]Orthopedics-Traumatology Department of the Donka University Hospital, Conakry, Guinea
[2]UFR Health Ziguinsor (UFR), Ziguinchor, Sénégal
Email: sidimesidex@yahoo.fr, mamadoufelahdiallo@gmail.com, camaratafsir654@gmail.com, aboudamira@yahoo.fr, boyekoivogui75@gmail.com, barryalhasilindin67@gmail.com, ab.diouf@univ-zig.sn, leolamah@yahoo.fr

How to cite this paper: Sory, S., Diallo, A.M.F., Tafsir, C., Amira, A., Koivogui, B., Alhassane, B., Diouf, A.B. and Leopold, L. (2025) Results of Surgical Treatment of Distal Radius Fractures under the Walant Anesthesia Technique: A Report of 12 Cases. *Open Journal of Orthopedics*, **15**, 185-191.
https://doi.org/10.4236/ojo.2025.155019

Received: April 2, 2025
Accepted: May 28, 2025
Published: May 31, 2025

Abstract

Introduction: The term WALANT (Wide Awake Local Anesthesia and No Tourniquet) refers to an anesthesia technique whose principle, similar to that of tumescent local anesthesia, is based on infiltration of the operating site by a local anesthetic (LA) solution associated with a vasoconstrictor: adrenaline [1]. We report the functional results in the per and immediate postoperative period of surgical management of fractures of the distal end of the radius under the WALANT. **Methodology:** This was a prospective descriptive study. It involved 12 patients with a distal radius fracture treated by pinning under WALANT between 2022 and 2023. For each patient, age, sex, duration of surgery, visual analogue scale during surgery, operating time, time spent in the recovery room and patient satisfaction were collected. Wrist mobility and the visual analogue scale were used to assess our results. **Result:** There were 9 women and 3 men. According to the AO/OTA classification, the fractures were type B (39.1%). The fractures were open in 5 cases (types 1 and 2 according to the Cauchoix and Duparc classification). The average time to surgical management was 8 hours. The average duration of surgery was 17 minutes. The average VAS during surgery was 2.3 (+/−1.6). The time spent in the recovery room was on average 30 minutes and the patient satisfaction rate was 96%. **Conclusion:** WALANT is a reliable, inexpensive, and safe technique. It allows for intraoperative wrist functional assessment. Today, it should be part of our therapeutic arsenal in the surgical treatment of EDR fractures.

Keywords

Distal Radius Fracture, Pinning, WALANT

1. Introduction

The term WALANT refers to an anesthesia technique whose principle, similar to that of tumescent local anesthesia, is based on the infiltration of a solution of local anesthetics combined with a vasoconstrictor (adrenaline) into the surgical site, making it possible to avoid the need for a pneumatic tourniquet. Concept initially described by dermatologist Jeffrey Klein in cosmetic surgery [1], it was under the impetus of Donald Lalonde, a Canadian hand surgeon, that WALANT was developed and promoted from the 1980s [2].

This technique of anesthesia by tumescence of the hand with xylocaine, which does without a tourniquet thanks to adrenaline, allows the patient, fully conscious during the operation, to make voluntary movements with his hand at the request of the surgeon.

The patient can then adapt the surgery and begin giving post-operative instructions to the patient. The patient's attention is then maximized, and the "link" between patient and caregiver is not broken during the procedure. [3].

This technique is not known in Guinea where general anesthesia and, to a lesser extent, locoregional anesthesia (LRA) are the only techniques for any thoracic limb surgery. We report the functional results in the per and immediate postoperative period of surgical management of fractures of the distal end of the radius under the WALANT.

2. Methodology

2.1. Series

We included patients over 18 years of age admitted in emergency for wrist trauma. We did not include patients with allergy to any component of the anesthetic solution, diabetics with advanced neuropathy, and patients with pathological vascular conditions.

Figure 1. Front and side X-ray of a 32-year-old patient showing a distal radius fracture associated with a fracture of the right ulnar styloid.

Figure 2. Radiological control.

A total of 12 patients with distal radius fractures were collected (**Figure 1**, **Figure 2**). There were 9 women and 3 men, a sex ratio of 3. The mean age was 49 years, with a range from 22 to 80 years.

2.2. Anesthetic Solution

The local anesthetic solution used by our team is obtained by mixing 9 ml of 1% lidocaine, 1 ml of adrenaline and 20 ml to 30 ml of physiological serum.

2.3. Infiltration Technique

The local anesthetic solution used varied from 30 ml to 40 ml.

The anesthetic solution was administered as follows:

For skin opening: 10 ml on the incision line;

For the fracture: 10 ml in the fracture site, 7 ml on the proximal fragment and 7 ml on the distal(subperiosteally).

In case of association of ulnar styloid fracture, 2 ml of solution was administered in the focus for painless reduction. We wait 30 minutes after infiltration of the anesthetic solution to begin debridement and/or reduction and pinning. Throughout the procedure, patients were asked if they felt any pain. This technique allowed us to achieve hemostasis and painlessness throughout the surgery (trimming, reduction, pinning). The osteosynthesis technique consisted of placing two to three 18/10 Kirchner pins followed by a plaster cast.

2.4. Methods for Evaluating Results

To evaluate the results of this study, we used the Visual Analogue Scale (VAS) and intraoperative wrist joint mobility (**Figure 3**). The VAS is a method of assessing pain intensity using a ruler with two sides: a patient side and a caregiver side. The score ranges from 0 (no pain) to 10 (maximum imaginable pain). It is a simple, reproducible self-assessment scale, sensitive to variations in pain intensity, offering a choice of response that cannot be remembered by the patient from one assessment to another.

In the immediate operating room, we asked for patient satisfaction.

Questions asked to patients upon leaving the operating room:

Did you have any pain during the anesthesia: YES NO

If yes (0 = completely painless, to 10 = most unbearable pain possible)

Figure 3. Wrist mobility.

If no (0 = absolutely not bothersome, to 10 = extremely unpleasant)

What overall satisfaction score would you give regarding the method of anesthesia?

0 = very dissatisfied to 10 = completely satisfied: ……..……..?

Did you have any pain during surgery: YES NO

If yes: 0 = completely painless to 10 = most unbearable pain possible.

Furthermore we have calculated the average time to surgical treatment, the average duration of intervention and the time spent in the recovery room.

3. Results

The average time for surgical treatment was 8 hours.

The mean VAS during the surgical procedure was 2.3 (+/−1.6).

The average intervention time was 17 minutes.

Dorsiflexion was between 60 - 70 (9 patients), 50 - 60 (3 patients); palmar flexion between 60 - 80 (10 patients), 58 (2 patients). The inclinations were on average 13 radial and 38 ulnar.

The time spent in the recovery room was on average 30 minutes.

The patient satisfaction rate was 96%.

The average length of hospital stay was 2 days.

4. Discussion

The local anesthetic solution used ranged from 30 ml to 40 ml. After administering the anesthetic solution without a tourniquet, we waited 30 minutes to begin trimming and/or reduction and pinning. This technique allowed us to achieve hemostasis and painlessness throughout the surgery (trimming, reduction, pinning).

Adrenaline-induced vasoconstriction is observed after a delay of approximately 25 minutes between infiltration and surgery. This is the time required to reach the

peak of the vasoconstrictor effect of adrenaline and thus obtain the best operating conditions [4].

For Lalonde [5], the discomfort of the tourniquet is very unpleasant and unnecessary for patients.

Studies by Iqbal *et al.* [6] indicate that the use of a tourniquet causes unnecessary pain intraoperatively with little identifiable benefit compared to the same surgery without the use of a tourniquet. In studies by Lee DC [7] and Ruxasagulwong S [8], it has been shown that removing the need for a tourniquet by adding adrenaline is less painful for patients with lower VAS scores, in addition to reducing total blood loss.

In our study, the average intervention time was 17 minutes and the patient satisfaction rate was 96%. The absence of pain and the patient's participation in the procedure explains this result. Indeed, he maintains control of his limb and helps with the installation and preparation of the limb for the procedure. It can also [9] at the surgeon's request, perform intraoperative mobilizations in order to test a tendon repair, validate the positioning of osteosynthesis material or a joint prosthesis.

Hugo Z's studies [10] showed advantages related to the WALANT technique by anesthesiologists: the absence of motor block, surgeon satisfaction and patient comfort. Accelerated discharge from hospital and safety of use were also put forward.

A randomized study [11] compared WALANT with local intravenous anesthesia[] (ALRIV or Bier block) and showed superiority of WALANT in terms of peri- and post-operative pain control, duration in the operating room and use of post-operative analgesics. Several studies, with large groups of patients and using the mixture proposed by Donald Lalonde's team, have shown an absence of risk of necrosis [2] [5]. Rare clinical cases published recently [12]-[14], report the appearance of digital necrosis after infiltration of adrenaline solution (10 ug/mL). It should be noted, however, that the patients concerned presented with particular vascular conditions (Raynaud's syndrome, severe arteriopathy).

5. Conclusion

WALANT is a reliable, inexpensive, and safe technique. It allows for intraoperative wrist functional assessment. Today, it should be part of our therapeutic arsenal in the surgical treatment of EDR fractures.

Authors' Contribution

Sory S: main author, designer of the data sheet, initiation of the work and writing of the article;

Diallo AMF: Using files and filling out forms;

Tafsir C: Using files and filling out forms;

Diouf AB: Statistical study;

Amira A: Statistical study;

Koivogui B: Statistical study;
Alhassane, B: Correction;
Leopold L: Correction.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Pogetti, A., Del Chiaro, A., Nicasto, M., Parchi, P., Piolanti, N. and Scaglione, M. (2018) A Local an-Esthesia without Tourniquet for Distal Fibula Hardware Removal after ORIF: The Use of Epinephrine in the Foot. A Randomized Clinical Study. *Journal of Biological Regulators & Homeostatic*, **32**, 57-65.

[2] Chowdhry, S., Seidenstricker, L., Cooney, D.S., Hazani, R. and Wilhelmi, B.J. (2010) Do Not Use Epinephrine in Digital Blocks: Myth or Truth? Part II. A Retrospective Review of 1111 Cases. *Plastic and Reconstructive Surgery*, **126**, 2031-2034. https://doi.org/10.1097/prs.0b013e3181f44486

[3] Teuku, N.P. and Yanis, M.A. (2024) Pain Score Evaluation in Patient Underwent Hand Surgery under Walant Compared to Those under Local or General Anesthesia with Tourniquet. *Journal of International Surgery and Clinical Medicine*, **4**, 8-11. https://doi.org/10.51559/jiscm.v4i1.53

[4] McKee, D.E., Lalonde, D.H., Thoma, A., Glennie, D.L. and Hayward, J.E. (2013) Optimal Time Delay between Epinephrine Injection and Incision to Minimize Bleeding. *Plastic and Reconstructive Surgery*, **131**, 811-814. https://doi.org/10.1097/prs.0b013e3182818ced

[5] Lalonde, D., Bell, M., Benoit, P., Sparkes, G., Denkler, K. and Chang, P. (2005) A Multicenter Prospective Study of 3,110 Consecutive Cases of Elective Epinephrine Use in the Fingers and Hand: The Dalhousie Project Clinical Phase. *The Journal of Hand Surgery*, **30**, 1061-1067. https://doi.org/10.1016/j.jhsa.2005.05.006

[6] Iqbal, H.J., Doorgakant, A., Rehmatullah, N.N.T., Ramavath, A.L., Pidikiti, P. and Lipscombe, S. (2018) Pain and Outcomes of Carpal Tunnel Release under Local Anaesthetic with or without a Tourniquet: A Randomized Controlled Trial. *Journal of Hand Surgery* (*European Volume*), **43**, 808-812. https://doi.org/10.1177/1753193418778999

[7] Lee, D. (2017) Wide Awake Hand Surgery. *Archives of Plastic Surgery*, **44**, 348-348. https://doi.org/10.5999/aps.2017.44.4.348

[8] Ruxasagulwong, S., Krainsrin, J. and Sanapanich, K. (2015) Wide Awake Technique versus Local Anesthesia with Tourniquet Application for Minor Orthopedic Hand Surgery: A Prospective Clinical Trial. *Journal of the Medical Association of Thailand*, **8**, 106-110.

[9] Mohd Rashid, M.Z., Sapuan, J. and Abdullah, S. (2019) A Randomized Controlled Trial of Trigger Finger Release under Digital Anesthesia with (WALANT) and without Adrenaline. *Journal of Orthopaedic Surgery*, **27**, 1-8. https://doi.org/10.1177/2309499019833002

[10] Campard, S., Gazeau, T., Debec, G. and De Keating-Hart, E. (2020) Wide Awake Local Anesthesia No Tourniquet (WALANT) échoguidé. *Le Praticien en Anesthésie Réanimation*, **24**, 22-25. https://doi.org/10.1016/j.pratan.2020.02.004

[11] Okamura, A., Moraes, V.Y.D., Fernandes, M., Raduan-Neto, J. and Belloti, J.C. (2021)

WALANT versus Intravenous Regional Anesthesia for Carpal Tunnel Syndrome: A Randomized Clinical Trial. *Sao Paulo Medical Journal*, **139**, 576-578. https://doi.org/10.1590/1516-3180.2020.0583.r2.0904221

[12] Zhang, J.X., Gray, J., Lalonde, D.H. and Carr, N. (2017) Digital Necrosis after Lidocaine and Epinephrine Injection in the Flexor Tendon Sheath without Phentolamine Rescue. *The Journal of Hand Surgery*, **42**, e119-e123. https://doi.org/10.1016/j.jhsa.2016.10.015

[13] Sama, C. (2016) Post-Traumatic Dgital Gangrene Associated with Epinephrine Use in Primary Raynaud's Phenomenon: Lesson for the Future. *Ethiopian Journal of Health Sciences*, **26**, 401-404. https://doi.org/10.4314/ejhs.v26i4.13

[14] Hutting, K., Van Rappart, J.R., Prins, A., Knepper, A.B. and Moues-Vink, C. (2015) Digital Necrosis after Local Anaesthesia with Epinephrine. *Nederlands Tijdschrift voor Geneeskunde*, **159**, A9477.