

Wide Awake Local Anaesthesia No Tourniquet for Clavicle Fracture Fixation: A Case Series

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ABSTRACT

The conventional management of clavicle fractures involves repositioning fractured segments into anatomic alignment, usually under General Anaesthesia (GA) or Regional Anaesthesia (RA). However, both techniques carry the risk of adverse outcomes. Wide Awake Local Anaesthesia No Tourniquet (WALANT) offers an alternative and can be used as a conservative approach for treating clavicle fractures. WALANT was developed to relieve pain and discomfort and reduce patient- and procedure-related complications associated with anaesthesia or sedation while maintaining the same standard of care as procedures performed under anaesthesia. This case series describes the use of the WALANT technique in three patients (2 males, 1 female) with displaced midshaft and distal-third clavicle fractures. Pain, patient satisfaction and surgeon satisfaction were evaluated. All three procedures were completed without complications, with minimal blood loss, low pain levels and stable vital signs throughout surgery. High levels of patient and surgeon satisfaction were reported postoperatively and no anaesthesia-related complications occurred. Pain relief was assessed from the time patients entered the operating room until discharge, with ongoing postoperative evaluation using standardised scoring systems for both patient and surgeon satisfaction. WALANT is considered an effective and safe technique and may serve as an alternative to conventional anaesthetic methods for procedures involving the shoulder and shoulder girdle, including clavicle fractures. This case series also provides useful information regarding postoperative outcomes and recovery time in patients treated with the WALANT technique.

Keywords: Analgesia, Bones, Orthopaedics, Pain, Satisfaction

INTRODUCTION

Clavicle fractures represent a large percentage of shoulder girdle fractures seen today. Displaced clavicle fractures typically require surgical reduction with some fixation to restore anatomical alignment, improve functional outcomes and minimise the risk of non union or malunion. These surgeries usually use GA or RA. GA and RA provide reliable conditions for surgery; however, there are known disadvantages, such as risks associated with airway management and cardiopulmonary complications, Postoperative Nausea and Vomiting (PONV), prolonged recovery time and potential for patient-related complications such as hemidiaphragmatic paralysis, loss of function to the muscles supplied by the affected nerves and other nerve-related complications due to RA [1,2].

The WALANT has been developed as a good option for providing Local Anaesthesia (LA) during such operations. This is achieved by injecting a dilute local anaesthetic solution with a vasoconstrictor to produce LA and minimise bleeding without having to use a tourniquet or GA. The use of this technique began with the hand and wrist and has now been extended to the fixation of fractures in both upper and lower limb areas. Minimising sedation and airway placement is beneficial for patients with additional health issues, as it aligns well with the concept of enhanced recovery [3-5].

The present case series aimed to describe the use of WALANT in surgical procedures on three patients with displaced clavicle fractures, evaluate perioperative analgesic management and perioperative pain assessment data and assess patient and surgeon satisfaction to support the use of WALANT as an efficient anaesthetic method for the surgical fixation of a fractured clavicle.

CASE SERIES

Case 1

A 32-year-old male, classified as American Society of Anaesthesiologists (ASA) physical status I, presented with pain,

swelling and deformity over the left clavicular region following a road traffic accident two days earlier. The pain had a sudden onset immediately after the injury, was sharp and localised to the clavicular area and progressively worsened with shoulder movement and arm elevation, while partially relieved with rest. His weight was 77 kg. Radiological imaging showed a displaced mid-shaft clavicle fracture (Robinson type 2B1) and surgical management with Open Reduction and Internal Fixation (ORIF) was planned. Preanaesthetic assessment showed no past or present history of chronic medical conditions or drug allergies. The patient's physical and systemic examination was also unremarkable. Airway assessment before surgery revealed a Mallampati Class I airway, with no signs of a difficult airway. The patient was physiologically fit with a normal heart rate, blood pressure and oxygen saturation. After explaining the different anaesthetic options, consent was obtained to proceed with surgery under WALANT.

In total, 35 mL of 1% lignocaine with adrenaline was used in a step-wise manner along the skin incision, subcutaneous tissues, muscle planes and around the fracture site, with a full periosteal dissection performed going around the fracture. The patient was awake and alert throughout the entire procedure and received no medication for sedation, anxiety, or pain relief. During the procedure, continuous Electrocardiography (ECG), Non Invasive Blood Pressure (NIBP) measurements taken at regular intervals and continuous pulse oximetry were monitored in accordance with standard anaesthesia monitoring guidelines. After 15 minutes of WALANT administration, at the incision, the patient rated their pain as 1/10 on a Visual Analogue Scale (VAS) and a maximum of 2/10 during the manipulation of the fracture site.

The fracture was reduced with standard superior access to the clavicle, using ORIF with a precontoured locking plate. Time taken for surgery was about 70 minutes and minimal bleeding occurred during this time due to the use of local vasoconstriction to enable the surgeon to have a clear view of the surgical area. The patient

reported VAS scores of 2/10 at 2 hours and 1/10 at 12 hours post-procedure. Pain relief was provided with paracetamol 1 g i.v. every eight hours. There were no anaesthetic complications reported, including Local Anaesthetic Systemic Toxicity (LAST) or any other wound complications. The patient rated his satisfaction as 5/5 (very satisfied) on a 5-point Likert scale. The surgeon rated his satisfaction with the anaesthetic conditions, haemostasis and patient cooperation as 5/5.

Case 2

A 45-year-old female, classified as ASA physical status II, with a history of well-controlled hypertension on amlodipine 5 mg for three years, presented with pain over the right shoulder and loss of function following a fall from height three days earlier. The pain had a sudden onset at the time of injury, was sharp and localised to the right clavicular and shoulder region and progressively worsened with shoulder movement, resulting in difficulty lifting the arm, while partially relieved with rest and immobilisation. Her weight was 63 kg. Radiological assessment showed that she had a displaced right lateral third clavicle fracture. Due to the amount of displacement, it was advised that she have this fracture surgically fixed. Her preanaesthetic evaluation revealed good functional capacity, controlled blood pressure and no other systemic diseases; normal cardiovascular and respiratory assessment (as well as normal airway assessment). Laboratory tests were all negative. The patient was counselled about awake surgery using the WALANT technique. The patient consented to the procedure and signed an informed consent form.

Lignocaine (1%) with adrenaline (35 mL) was infiltrated to provide additional periosteal and soft-tissue coverage for the fractured lateral one-third of the clavicle. The anaesthetic was administered in a step-wise manner with intermittent aspiration prior to each injection. The patient remained conscious and calm throughout the procedure. No sedation or pain relief was given intravenously. The anaesthetic procedure was performed according to standard ASA monitoring. The surgery was started 15 minutes after WALANT administration. The patient's VAS score during surgery was 0/10; during drilling holes for implant and fixation, it was 1/10. A clavicular hook plate with ORIF was performed via a superior approach. The surgery lasted approximately 80 minutes and resulted in minimal blood loss. The overall conditions were good for the operation. Post-surgery, the patient remained stable and continued to exhibit normal vital signs. During recovery, postoperative VAS were 3/10 at 2 hours and 2/10 at 12 hours after surgery. Pain was managed by paracetamol i.v. 1 g every eight hours. No anaesthetic side-effects were reported. The patient rated the experience 4/5 (satisfied) on a 5-point Likert scale and the surgeon rated the anaesthetic approach 5/5 in terms of satisfaction.

Case 3

A 28-year-old male, classified as ASA physical status I, with no significant medical history, presented with pain and limited use of the shoulder following a sports-related injury four days earlier. The pain had a sudden onset at the time of injury, was sharp and localised to the shoulder region and progressively increased with shoulder movement, leading to restriction of arm elevation and daily activities, while partially relieved with rest and immobilisation. He weighed 81 kg. An X-ray showed a mid-shaft, displaced, comminuted fracture of the left clavicle. Given the patient's young age and functional requirements, ORIF was performed. He underwent a medical evaluation and was found to be in good health, without any significant medical history or drug allergies. The patient's airway assessment and routine laboratory tests were also normal. The WALANT method was described to the patient before the operation, along with the knowledge that he would be awake during the procedure. Consent to use WALANT was obtained from the patient before the operation.

Effective anaesthesia was achieved with a total of 38 mL of 1% lignocaine with adrenaline, with special emphasis on periosteal infiltration. Great care was taken in the injection sites as the area was slowly and gradually infiltrated (from the lateral to the medial side) with continuous aspiration to ensure no intravascular injection and surgery was started after 15 minutes. ECG, NIBP and pulse oximetry recordings were observed throughout the procedure. The patient's pain score at the time of incision was 1/10 and it briefly increased to 3/10 at the time of fracture reduction. He tolerated the pain and no additional intervention was required.

A standard superior approach was used to perform an ORIF with a precontoured locking compression plate surgically. The operation took about 65 minutes and blood loss was minimal. After the operation, the patient was stabilised in a monitored unit, where vital signs remained stable and there were no immediate incidents. There were no significant post-anaesthetic complications. VAS at 2 and 12 hours was reported as 2/10 and 3/10, respectively. Pain was managed by paracetamol i.v. 1 g every eight hours. Satisfaction ratings, based on Likert scales, were 5/5 for the patient and 4/5 for the surgeon.

All three patients maintained stable haemodynamic parameters throughout surgery (HR, NIBP, SpO₂) at both incision and during fracture manipulation [Table/Fig-1] [6].

Parameters	Case 1 (32/M, ASA I)	Case 2 (45/F, ASA II)	Case 3 (28/M, ASA I)
HR at incision (bpm)	72	75	70
HR during fracture manipulation (bpm)	78	80	76
NIBP at incision (mmHg)	118/76	122/78	115/75
NIBP during fracture manipulation (mmHg)	125/82	130/84	123/80
SpO ₂ at incision (%)	98	97	98
SpO ₂ during fracture manipulation (%)	100	99	100
Intraoperative VAS	1-2	0-1	1-3
Postoperative VAS (2 h/12 h)	2 / 1	3 / 2	2 / 3
Analgesic used	Paracetamol 1 g i.v. q8h	Paracetamol 1 g i.v. q8h	Paracetamol 1 g i.v. q8h
Time to radiological fracture union (weeks)	10 weeks	11 weeks	9 weeks
Functional outcome score (Constant-Murley Score at 3 months [6])	92/100	88/100	94/100
Complications	None	None	None

[Table/Fig-1]: Intraoperative haemodynamic parameters, pain scores, postoperative analgesia, fracture union time, functional outcomes (Constant-Murley score) and complications in the three cases [6].

DISCUSSION

Orthopaedic practice is progressively implementing WALANT, an anaesthetic technique that is gradually being adapted for certain trauma operations. The drug delivery involves the use of a diluted local anaesthetic mixed with a vasoconstrictor to achieve both sensory blockade and surgical haemostasis, allowing the patient to remain conscious and breathe spontaneously. In the present case series, none of the patients were sedated and all received only local anaesthetic infiltration under standard monitoring. All procedures were completed successfully with minimal blood loss, low pain scores, stable haemodynamics and high patient and surgeon satisfaction [7,8]. Similar findings have been reported by Pandey A et al., who evaluated 15 patients undergoing clavicle fixation under WALANT and reported very low intraoperative pain scores with no complications [9]. Likewise, Ahmad AA et al., described successful clavicle plating in 16 patients using WALANT, demonstrating effective analgesia and high patient tolerance without the need for GA [10].

Effective analgesia for clavicle fracture fixation under WALANT relies primarily on meticulous infiltration technique, particularly at the periosteal level, because the clavicle and surrounding tissues have rich sensory innervation. In the present series, systematic step-wise infiltration of the incision site, deeper tissue planes and circumferential periosteal surfaces resulted in consistently low intraoperative pain scores [7,8]. Comparable outcomes were observed in the study by Kafiabadi MJ et al., in which most patients reported a pain score of zero during surgery, with minimal discomfort during fracture reduction in a few cases [11]. Similarly, Niempoog S et al., reported successful clavicle fixation with adequate analgesia and minimal bleeding in a patient with significant cardiac co-morbidity. The vasoconstrictive component also contributed to a relatively dry surgical field, improving operative efficiency without the need for a tourniquet [8].

From an anaesthetic perspective, fixation of clavicle fractures under WALANT presents several challenges. These include achieving adequate periosteal analgesia, maintaining local anaesthetic dosing within safe limits and ensuring patient comfort during an awake procedure. In the present case series, a dilute lignocaine-adrenaline solution was used and total doses were calculated based on patient weight to remain within safety margins. Infiltration was performed incrementally with frequent aspiration to avoid intravascular injection. Continuous monitoring and communication with the patient enabled early detection of any symptoms of LAST; however, none were observed [8].

An additional advantage of WALANT observed in this case series was the avoidance of sedation and opioid use. All patients remained

haemodynamically stable, cooperative and alert throughout the procedure, with no respiratory compromise, hypotension, or desaturation. The postoperative period was characterised by rapid recovery and minimal analgesic requirement. These findings correlate with previously reported case series demonstrating reduced postoperative nausea, faster mobilisation and improved recovery when compared with conventional anaesthetic techniques. Surgeon satisfaction in the present series was also high, indicating adequate analgesia, haemostasis and favourable surgical conditions when the technique is carefully executed with proper patient selection and counselling [8,11,12].

Alternative anaesthetic strategies for clavicle fracture fixation include GA and regional techniques such as interscalene or combined cervical plexus blocks. These methods provide effective surgical conditions but are associated with risks including airway manipulation, phrenic nerve palsy, respiratory compromise, systemic anaesthetic exposure and postoperative nausea or sedation. In the present case series, WALANT was preferred because it avoids airway instrumentation, allows continuous neurological monitoring and supports enhanced recovery pathways. Despite its advantages, this case series has limitations, including the small number of patients and the subjective nature of VAS and Likert scale assessments [2,9,11].

Various case series and studies from different parts of the world have been compiled in [Table/Fig-2] to highlight the safety and effectiveness of the WALANT technique, as well as its benefits, including reduced bleeding, effective pain relief and minimal complications, even in patients with high-risk conditions [8-11].

Authors	Case description	Anaesthetic management	Takeaway
Present case series	Three patients with displaced clavicle fractures (mid-shaft and lateral-third) requiring ORIF following trauma (Road Traffic Accident (RTA), fall, sports injury).	All patients underwent WALANT using 1% lignocaine with adrenaline (1:200,000). Incremental infiltration was used, with total doses ranging from 350 mg to 380 mg, based on body weight. No sedation or opioid medications were administered. Monitoring included ECG, NIBP and pulse oximetry. Intraoperative pain assessed using the VAS remained low, ranging from 1 to 3 during local anaesthetic infiltration and surgical manipulation. Postoperative VAS scores were also minimal, ranging from 1 to 3 during the first 12 hours, reflecting effective pain control.	WALANT provides adequate analgesia, effective haemostasis and minimal intraoperative blood loss, eliminating the need for sedation or general anaesthesia. High patient and surgeon satisfaction was reported. Local anaesthetic doses remained within safety margins and no signs of systemic toxicity were observed. This approach supports enhanced recovery and rapid mobilisation.
Pandey A et al., (2025), India [9]	A total of 15 patients (13 males, 2 females) with displaced clavicle fractures, primarily following RTA. Clavicle fixation was done with a locking compression plate.	Lignocaine with adrenaline was infiltrated around the fracture and surrounding tissues. Intraoperative VAS scores were monitored, with an average VAS score of 0.933 during the procedure. No sedation or GA was used.	WALANT was demonstrated to be a safe and effective technique for clavicular fracture fixation, offering excellent pain control, minimal blood loss and substantial cost savings due to the reduced need for GA and theatre personnel. No complications were noted and all patients achieved good fracture union. WALANT was successfully used in high-risk patients and for bilateral clavicle fixations without compromising respiratory function.
Kafiabadi MJ et al., (2023), Iran [11]	30 patients with clavicle fractures (mainly mid-shaft) undergoing fixation. The study evaluated the effects of WALANT on intraoperative bleeding, pain control and postoperative outcomes.	1% lidocaine with adrenaline (1:100,000) and sodium bicarbonate (10:1) was used, with a total of 40 mL injected (10 mL subcutaneously along the clavicle, 30 mL subperiosteally). The Numerical Pain Rating Score was 0 for most patients, with 2 patients reporting mild pain (scores of 1-2) during reduction.	WALANT proved to be an effective and safe alternative to GA for clavicle fracture fixation, especially in patients with medical comorbidities or difficult intubation. It provided excellent pain control during surgery, reduced intraoperative bleeding and was well-tolerated. This technique showed early postoperative benefits with minimal complications.
Niempoog S et al., (2021), Thailand [8]	A 28-year-old male with uncontrolled atrial fibrillation presented with a comminuted mid-shaft clavicle fracture following RTA. GA was deemed unsuitable due to his medical condition. WALANT was chosen.	A solution of 50 mL 1% lidocaine (without adrenaline), 5 mL 7.5% sodium bicarbonate, 1 mL adrenaline and normal saline to a total volume of 200 mL was used. An anaesthetic was injected directly around the fracture site and along the incision line until soft-tissue swelling was achieved. Surgery was performed under WALANT without sedation.	WALANT was successfully used for clavicle fixation in a patient with contraindications for GA due to atrial fibrillation. This technique provided good analgesia, minimal bleeding and allowed the patient to remain conscious and cooperative throughout the procedure. Postoperative recovery was quick, with no complications or need for intravenous anaesthetics postsurgery.
Ahmad AA et al., (2020), Malaysia [10]	A total of 16 patients underwent clavicle fracture fixation under WALANT. Patients were treated with clavicle plating, an option traditionally performed under GA.	A solution of 1% lidocaine, 1:1,00,000 epinephrine and 10:1 sodium bicarbonate was used. A total of 40 mL was injected: 10 mL subcutaneously along the clavicle and 30 mL subperiosteally at multiple sites. The Numerical Pain Rating Score during injection and surgery was 0 for most patients, with 2 patients reporting mild pain (scores 1-2) during fracture reduction.	WALANT was successfully employed for clavicle plating in 16 patients with displaced fractures, with minimal pain and no complications. The technique provides effective pain control, even during reduction and has the potential to replace general anaesthesia in clavicle fixation, offering good patient cooperation, minimal blood loss and rapid recovery.

[Table/Fig-2]: Summary of case series on clavicle fracture fixation using WALANT [8-11].

CONCLUSION(S)

The WALANT appears to be a feasible and effective technique for the surgical fixation of clavicle fractures. In this case series, the technique provided adequate intraoperative analgesia, minimal blood loss and favourable surgical conditions without the need for sedation or general anaesthesia. Patients experienced minimal intraoperative and postoperative pain, maintained stable physiological parameters and reported high satisfaction, along with positive feedback from the surgeon. With careful patient selection and appropriate preoperative counselling, WALANT may serve as a useful alternative to conventional regional or general anaesthetic techniques for clavicle fracture fixation.

REFERENCES

[1]

Donnelly TD, MacFarlane RJ, Nagy MT, Ralte P, Waseem M. Fractures of the clavicle: An overview. *Open Orthop J.* 2013;7(1):329-33.

[2]

Lee CCM, Beh ZY, Lua CB, Peng K, Fathil SM, Hou JD, et al. Regional anaesthetic and analgesic techniques for clavicle fractures and clavicle surgeries: Part 1: A scoping review. *Healthcare.* 2022;10(8):1487.

[3]

Stocker-Downing TH, McAllister R, Chan S, Mullikin I, Krul K. Wide-awake local anaesthesia with no tourniquet (WALANT) carpal tunnel release in the clinic: A clinical practice update. *J Clin Med.* 2025;14(18):6407.

[4]

Shepard S, Aluvaala ES, Bamberger HB. Wide-awake local anaesthesia for a proximal humerus fracture: A case report. *J Orthop Case Rep.* 2024;14(4):115-19.

[5]

Kurtzman JS, Etcheson JL, Koehler SM. Wide-awake local anaesthesia with no tourniquet: An updated review. *Plast Reconstr Surg Glob Open.* 2021;9(3):e3507.

[6]

Vrotsou K, Ávila M, Machón M, Mateo-Abad M, Pardo Y, Garin O, et al. Constant–Murley Score: Systematic review and standardized evaluation in different shoulder pathologies. *Qual Life Res.* 2018;27(9):2217-26.

[7]

Delgado DA, Lambert BS, Boutris N, McCulloch PC, Robbins AB, Moreno MR, et al. Validation of digital visual analog scale pain scoring with a traditional paper-based visual analog scale in adults. *JAAOS Glob Res Rev.* 2018;2(3):e088.

[8]

Niempoog S, Tanariyakul Y, Jaroenporn W. Wide-awake local anaesthesia for clavicle fracture fixation: A case report. *Int J Surg Case Rep.* 2021;79:112-15.

[9]

Pandey A, Dubey S, Dubey A, Dubey R. Fixation of clavicle with WALANT technique: A case series. *Int J Curr Pharm Rev Res.* 2025;17(7):1370-72. Doi: 10.18203/ijcpr.v17i7.227.

[10]

Ahmad AA, Ubaidah Mustapa Kamal MA, Ruslan SR, Abdullah S, Ahmad AR. Plating of clavicle fracture using the wide-awake technique. *J Shoulder Elbow Surg.* 2020;29(11):2319-25.

[11]

Kafiabadi MJ, Sabaghzadeh A, Biglari F, Sadighi M, Ebrahimpour A. Effects of fixation of clavicle fracture using wide-awake local anaesthesia no tourniquet (WALANT) technique on intra-operative bleeding volume, surgical duration, and postoperative Visual Analog Scale (VAS): A case series study. *Injury.* 2023;54(2):557-60.

[12]

Joshi A, Kale S, Chandel S, Pal DK. Likert scale: Explored and explained. *Br J Appl Sci Technol.* 2015;7(4):396-403.

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