



Titrated Axillary Block Like an Alternative of WALANT Technique

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Abstract

Purpose: The WALANT technique is an anaesthetic method for soft tissue surgery of the hand and forearm. Despite having been described several years ago its use in the orthopaedic or anaesthetic community is far from being commonplace. One of its most important features is to maintain an active voluntary contraction of the patient's muscles during surgery. In the absence of health professionals having an expertise in this technique there is an alternative that we describe in this paper: the titrated axillary block.

Clinical Features: A 47-year-old man underwent a forearm tendon transfer surgery. The orthopaedic stand anaesthetist taking care of this patient was not experts in the WALANT technique. After the accurate assessment of the surgical procedure, an axillary block was performed in two steps. Firstly, a single injection of local anaesthetics was progressively achieved around the musculocutaneous nerve, then the radial nerve and finally the ulnar nerve to induce a complete sensory and motor block in these nerves areas. Secondly, a perineural catheter was placed near the median nerve allowing a titrated injection of lidocaine. A 50 minutes tourniquet was used during the surgery. Upon tourniquet deflation the patient recovered his flexor muscles motricity. The surgeon could adjust his suture tension. The postoperative period was uneventful and the perineural catheter was used for pain control.

Conclusion: When WALANT technique is not available or mastered there is still a role for loco regional anaesthesia in reconstructive orthopaedic surgery of the upper limb to maintain an active voluntary muscle contraction during the procedure.

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Introduction

Hand or forearm surgery can be performed under local anaesthesia by orthopaedic surgeons on their own. This technique is named WALANT which is the acronym for Wide Awake Local Anaesthesia No Tourniquet [1,2]. The aim being bloodless surgical field with no pain due to the tourniquet, lack of motor block especially during tendon surgery. The expectations are as follows: satisfaction of the patient and the surgeon, reduced costs with no anaesthetist's intervention. We here by present our experience to demonstrate the possible place of loco regional anaesthesia in obtaining the same objectives as the WALANT technique [1,2].

Case Presentation

A 47-year-old man was injured in a motor vehicle accident. He had a serious forearm injury requiring multiple procedures under general and loco regional anaesthesia, including a Masquelet technique. He also had a thumb extensor deficit. The surgeon hoped to proceed to a tendon transfer under loco regional anaesthesia without motor block. He wanted to keep an active voluntary contraction of the fourth superficial flexor tendon after having it transposed to the extensor pollicis longus. The aim was to adjust suture tension during the surgery. A titrated axillary block was used to achieve this. The patient was admitted in a pre-anaesthetic room before surgery for performing an axillary block in two steps. Firstly, a single puncture with a 21G, 80 mm needle was achieved progressively by an ultrasound guided in-plane approach with neuro stimulation, around the musculocutaneous nerve, then the radial nerve and finally the ulnar nerve with three times 5 ml of ropivacaine concentrated at 4.75 mg/ml. We took care to check that the median nerve was not reached by the spread of the local anaesthetic. Secondly, a perineural catheter was placed near the median nerve by an ultrasound guided out-of-plane approach without any local anaesthetic's injection. Fifteen minutes later the axillary block was dissociated, and we could confirm that the median nerve's

activity was not affected by the previous local anaesthetic's diffusion. As soon as the patient was admitted into the operating room, a 15 ml injection of lidocaine concentrated at 1.33% (10 ml of 1% lidocaine plus 5 ml of 2% lidocaine without epinephrine) was injected through the perineural catheter. The tourniquet was inflated to 250 mmHg and the patient was mildly sedated with Midazolam in order to reach a Ramsay's score of 2 or 3. The surgeon performed 3 incisions: two on the anterior and posterior sides of the lower half of the right forearm and one along the palmar crease of the fourth metacarpophalangeal joint. During the surgical dissection we observed a complete motor block of the hand. Once tendon's transfer was achieved across the interosseous membrane, the tourniquet was deflated after 50 minutes. Five minutes later, the patient described par-aesthesia and was able to flex his three first fingers and his wrist. The surgeon could discuss with the patient and ordered him to contract the transposed flexor muscle to adjust his suture tension. Subsequently the tourniquet was inflated again to allow the surgeon to complete his surgery. An additional 5 ml of 2% lidocaine was injected through the perineural catheter. The postoperative period was uneventful. The perineural catheter was used for pain control with repeated boluses of 0.2% ropivacaine at the patient's request. Patient's satisfaction was high even though he felt the pressure of the tourniquet during surgery and some par-aesthesia related to the perineural patient-controlled analgesia.

Discussion

The surgeon had no experience with the WALANT technique. This is why his request was a real challenge for the anaesthetist. As a reminder this technique is to perform multiple injections of diluted lidocaine with epinephrine to obtain a sensory block without motor block and a bloodless surgical field without the use of a pneumatic tourniquet. Distal block's techniques on the forearm can be used especially for hand's surgery but were not appropriate in this case. The success and performance of this "titrated axillary block" were related to the close collaboration between surgeon and anaesthetist and knowledge of local anaesthetics. Indeed, the accurate assessment of the surgical procedure led to highlight the moment when it was necessary to have no median motor block which was close to the end of the procedure. Fifteen ml of 1.33% lidocaine allowed covering for a 50 minutes time surgical dissection and finally obtaining a differential

block. The tourniquet cuff pressure leads to a nerve ischemia causing a motor block which we observed during this surgery. This subsided when the tourniquet was deflated. Single injections around the musculocutaneous, radial and ulnar nerves by a long-acting local anaesthetic such as 4.75 mg/ml ropivacaine controlled all areas that could undergo a complete neurological blockade irrespective of surgical time. The axillary catheter placed near the median nerve was used for two reasons: firstly, to titrate the action of the local anaesthetic on this nerve in order to obtain a deep anaesthesia during the surgical dissection alongside a differential block to test the tendon suture at the end of the procedure; secondly to achieve a good pain relief for this patient who had been the object of multiple surgeries.

Conclusion

Loco regional anaesthesia is usually performed with a single injection of concentrated local anaesthetic to achieve a motor and sensory block for surgery alongside postoperative pain relief. Currently there is some debate around the use of perineural catheters in the post-operative period in contrast to adjuvant drugs or newly marketed slow release local anaesthetics. Orthopaedic reconstructive surgery of the upper limb involves a new anaesthetic approach. More and more surgeons perform now the WALANT technique. Anaesthetists must keep their status in this type of surgery by initiating variants of loco regional anaesthesia as this was presented in this case report.

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