

Case Report

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Interscalene block for shoulder surgery

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Abstract

Fracture dislocation of the shoulder is a common musculoskeletal injury following road traffic accident. Peripheral nerve block has become a recognized anesthetic technique due to the rapid onset of prolonged analgesia, sufficient for both pain and surgical management. However, interscalene block for shoulder surgery has not been reported as a primary anesthetic technique in our environment. We report its successful use in open reduction and internal fixation of left humeral surgical neck fracture dislocation. The interscalene brachial plexus were localized by a Polystim II nerve stimulator (te me na, Bondy, France) with sustained biceps motor response at 0.2 mA and 40 ml of local anesthetic, comprising 0.25% bupivacaine and 1.0% of lidocaine with 1 : 200 000 epinephrine in equal parts was administered to establish the block. Surgical anesthesia was achieved 18 minutes after instituting the block and surgery lasted 70 minutes without complications. This technique may obviate the use of general anesthesia with its risks.

Keywords: Interscalene brachial plexus block, regional anesthesia, shoulder surgery

Résumé

Fracture luxation de l'épaule est une commune blessures musculo-squelettiques suite route trafic accident. Périphériques nerf bloc est devenue une technique anesthésique reconnue en raison de l'apparition rapide d'une analgésie prolongée, amplifie cace pour la douleur et de traitement chirurgical. Cependant, interscalene bloc pour la chirurgie de l'épaule n'a pas été signalé comme un technique anesthésique primaire dans notre environnement. Nous rapportons son utilisation réussie en réduction ouverte et interne fixation de dislocation de fracture de gauche cou chirurgicale humérale. Plexus brachial interscalene ont été localisés par un nerf Polystim II stimulateur (te me na, Bondy, France) avec réponse motrice biceps soutenue à 0,2 mA et 40 ml d'anesthésique local, comprenant la bupivacaine de 0,25% et 1,0% de lidocaïne avec 1 : 200 000 épinéphrine à parts égales a administré pour établir le bloc. L'anesthésie chirurgicale a été atteint 18 minutes après l'instauration du bloc et chirurgie a duré 70 minutes sans complications. Cette technique peut éviter l'utilisation de l'anesthésie générale avec ses risques.

Mots clés: Bloc de interscalene du plexus brachial, anesthésie loco-régionale, chirurgie de l'épaule

Introduction

Road traffic accident (RTA) is the most frequent cause of musculoskeletal injuries in Nigeria.^[1,2] Regional anesthesia offers in this setting appropriate analgesia sufficient for pain relief and surgical intervention in extremity injuries.^[3] These techniques may obviate the use of general anesthesia with their side effects.

Furthermore, opioid requirements are reduced in these patients and opioid-related side effects such as nausea, vomiting, pruritus, and respiratory depression are avoided.^[4,5] The interscalene approach to the brachial plexus is not commonly used as a primary anesthetic technique for open reduction and internal fixation of a fractured head of humerus in Nigeria. We report its use in this

47-year-old man with fracture dislocation of the left shoulder following RTA.

Case Report

A 47-year-old male patient, 68 kg, American Society of Anesthesiologists' physical status 1, presented with a closed fracture of the left head of humerus following RTA. The initial assessment, resuscitation, and stabilization were done in another hospital before his referral to the Accidents and Emergency Department of the University College Hospital (UCH), Ibadan. He was scheduled for open reduction and internal fixation of the fractured left head of humerus under anesthesia. His packed cell volume was 42% and Urea and Electrolytes were normal. The anesthetic option, interscalene brachial plexus block was discussed with the patient and verbal consent was obtained for the procedure.

In the operating room, intravenous access with an 18G cannula placed on the right arm was secured with 500 ml Ringer's Lactate solution. Monitoring consisted of noninvasive blood pressure (BP), electrocardiography, pulse oximetry, and heart rate (HR) using the Dash 4000 Modular Multiparameter monitor. The preblock vital signs include BP, 126/87 mmHg; HR, 96 beats/min; and oxygen saturation (SaO₂), 98% breathing room air. The patient was in supine position, his head turned away from the side to be blocked. The pain score in the affected shoulder was visual analogue score 9/10, where 0 = no pain and 10 = worst pain imaginable. The interscalene groove was palpated from rolling the fingers laterally from the posterior border of the sternomastoid muscle over the belly of the anterior scalene muscle. This groove between the anterior and middle scalene muscles was identified at the level of the cricoid cartilage corresponding to the sixth cervical vertebra. After skin preparation

with antiseptic and drapes, a 5-cm 21G polymedic stimulating needle was inserted perpendicular to the skin and directed caudally using Polystim 11 nerve stimulator (te me na, Bondy, France). The initial current intensity was 1.5 mA at a frequency of 2 Hz and impulse duration of 0.1 m/s. Muscle twitch of the biceps which was obtained at this current threshold was sustained at 0.2 mA, confirming correct needle placement. A total of 40 ml of local anesthetic comprising 0.25% bupivacaine and 1.0% of lidocaine with 1:200 000 epinephrine in equal parts was injected slowly in divided doses with repeated negative aspiration tests. The block started to take effect within 5 minutes as the patient reported pins-and-needle-type paresthesia in the C5-6 nerve distribution. Sensorimotor block was complete in 18 minutes with loss of pinprick sensation, inability to lift or abduct arm, and numbness over the affected shoulder. He was sedated with intravenous diazepam 3 mg and fentanyl 50 mcg, and remained hemodynamically stable throughout the procedure which lasted 70 minutes. SaO₂ was 97 to 99% on oxygen through facemask at 3 l/min; HR was stable at 82 to 98 beats/min, systolic BP range was 122 to 146 mmHg, and diastolic BP was 74 to 88 mmHg. He had 1000 ml of Ringers' lactate with estimated blood loss of about 200 ml. The block lasted 5 hours, and the patient described the surgical anesthesia as good and would choose a brachial plexus block, if he was to have a repeat surgery. See Figures 1 and 2 which showed left shoulder X-ray before and after open reduction and internal fixation.

Discussion

This case report illustrates the effectiveness of interscalene block as a primary anesthetic for shoulder surgery. Brachial plexus anesthesia using local anesthetic agents provide sensorimotor block to the entire upper limb, suitable for orthopedic

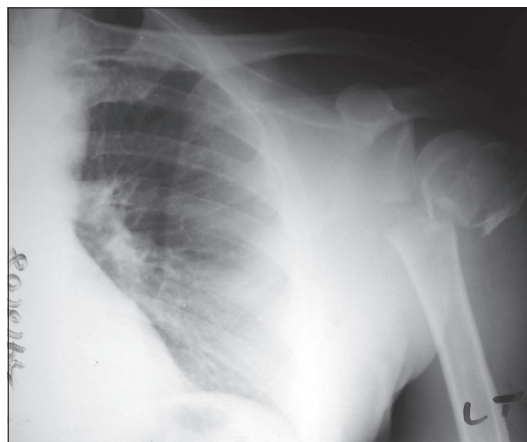


Figure 1: Left shoulder X-ray before open reduction and internal fixation

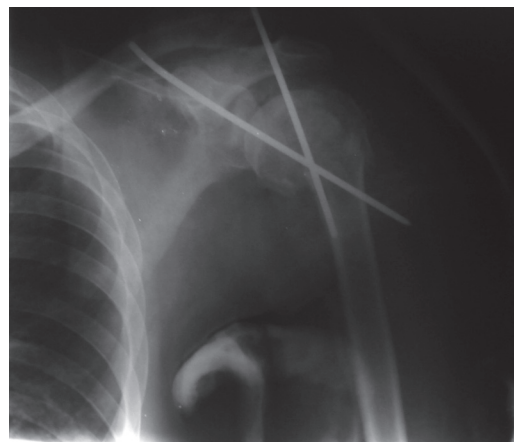


Figure 2: Left shoulder X-ray after open reduction and internal fixation

and plastic operations.^[3,6,7] Joshy *et al.*^[8] in a study of 104 patients undergoing shoulder surgery reported that interscalene block provided safe and sustained adequate pain relief. Only a small percentage (6%) showed signs of Horner's syndrome which resolved by 12 hours.

The interscalene approach to the brachial plexus is ideal for proximal upper limb procedures. Winnie's approach uses the sixth cervical transverse process as landmark for needle insertion.^[9] Borgeat *et al.* described a modified lateral approach in which the block needle puncture point is 0.5 cm below the level of the cricoid (Winnie's point) to avoid piercing the scalene muscles.^[10] A posterior approach was described by Pippa *et al.*, with the advantage that the vertebral vessels are not penetrated during puncture.^[11] A new posterolateral (transscalene) approach has been described in a case series of 27 patients with 85% success rate and minor complications.^[12] Nerve localization can also be done by eliciting paresthesia or using ultrasonography.^[3,6] Boezaart *et al.* in their study found nerve stimulation better than paresthesia technique in the block onset, duration, and patient satisfaction.^[13] We were able to achieve complete surgical anesthesia within 18 minutes of instituting the block, and surgery lasted 70 minutes.

The risks of interscalene block are inadvertent vertebral artery injection, pneumothorax, Horner's syndrome, recurrent laryngeal nerve block, symptomatic hemidiaphragmatic paresis from phrenic nerve block, inadvertent subarachnoid, or epidural block.^[3,6,14] None of these complications was observed in our case patient. The use of pulse oximeter, electrocardiography, and repeated aspiration during injection of the local anesthetic solution could warn in the event of accidental intravascular injection. This case shows that interscalene block can provide surgical anesthesia for shoulder surgery without complications using electrical stimulation for nerve localization.

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