A case with complicated brachial plexus block mistaken for tourniquet paralysis reminding the importance of communication and collaboration in teamwork

Ali UTKAN¹, Anıl AGAR², Kubilay Uğurcan CERİTOĞLU³, Aydı̇n Arslan⁴*, Burak KOCAK⁵

¹,³&⁵ Ankara Numune Research and Training Hospital, Orthopedics and Traumatology Department, Clinic B, Ankara, Turkey,
²State Hospital, Orthopedics and Traumatology Department, Hatay, Turkey,
⁴Malatya State Hospital, Orthopedics and Traumatology Clinic, Turkey.

ABSTRACT

Complications may occur even though every precaution is taken to prevent them and physicians can find themselves defending against unfair claims. A 21-year-old man complained of inability to move his elbow, wrist and fingers after he had been operated for his ulna fracture. With the initial assumption of tourniquet palsy as the cause, the patient was not examined thoroughly. The tourniquet is used routinely in operating theatres and most of the few complications seen with its use are usually preventable and often have medicolegal implications. The surgeons were almost to explain the patient and his relatives about this detrimental and unacceptable complication if they did not learned actually anesthetist performed infraclavicular brachial plexus block before administering general anesthesia. Unfortunately it turned out that this was not just a prolonged presentation but also an unexpected complication of the blockade. At three months the fracture united clinically and full neurologic recovery is detected at four months. A prolonged local anesthetic regional nerve blockade can be confused with nerve palsy as an unexpected operation complication. Accurate diagnosis of the situation rests firmly upon the communication and collaboration among surgeons and anesthesiologists and a competently performed physical examination without making any assumptions.

KEYWORDS: communication, collaboration, tourniquet paralysis, neuropathy, brachial plexus block, preemptive analgesia, complication

INTRODUCTION

Dealing with complication is one of the most undesirable aspects of medical practice and upsets the physician, the patient, and the patient's family. The potential for a malpractice suit exists for all physicians and it is always better to have a forthright conversation with the patient, explaining what happened and why[1]. We report a case with a prolonged brachial plexus were about to be confused with tourniquet palsy. Unfortunately it turned out it was a complicated subclavian block. This case worth reporting because the experience provided by this one helped us not to overlook combined regional and general anesthesia anymore and to evaluate patients appropriately.

CASE REPORT

A 21-year-old man was admitted to hospital with a swollen mid forearm after being hit with a stick across his left arm.

In radiographs diaphyseal fracture of left ulna (AO type 22-B1) was diagnosed (Figure 1). A splint was applied and was scheduled for operation. He had history of marijuana addiction and drug abuse with Biperiden and Clonazepam tablets.

Operation was performed on the 5th day of injury. According to anesthesiology records the patient underwent a left sided infraclavicular brachial plexus block with 0.5% Bupivacaine and then was anaesthetized using Propofol and Fentanyl for induction followed by neuromuscular block with Vecuronium bromide and intubated respiration with Nitrous oxide, Oxygen and Sevoflurane.

An orthopedic resident accompanied the patient from the moment he entered to the operating room but the rest of the operating team entered the room during the routine preparation of surgical site. His arm was emptied of blood using an Esmarch’s bandage. A pneumatic tourniquet cuff
was applied to the upper arm and the pressure adjusted to 220 mmHg. Osteosynthesis was performed with locking compression plate and screws and the operation lasted less than an hour (Figure 2).

During the post-operative rounds the patient complained of inability to move his left elbow, wrist and fingers. He also felt paraesthesia over the whole left upper arm below the region where tourniquet was applied. Filling of distal pulses were palpable and there was no evidence of compartment syndrome. As it was known the patient was operated on under general anesthesia, and preemptive regional anesthesia was not taken into account the patient was considered suffering from tourniquet palsy. Just before the team was about to inform the patient and his family about this nasty complication, the resident who witnessed the procedure but did not join the rounds came and mentioned the procedure to the rest.

A more detailed physical examination revealed also the absence of motor function in the axillary and musculocutaneous, nerves in addition to radial, ulnar and median nerves. Unfortunately left upper extremity paresis and numbness remained at 24 hours after the operation. Then it appeared that the problem was a complete brachial plexus palsy developed by the brachial plexus block.

Over the next week, the shoulder, elbow and wrist movements recovered considerably but there was still only a flicker of movement in the fingers. Moreover, the paraesthesia over the left arm had also remained. At three weeks, preganglionic lesions compatible with the process of regeneration at the level of C8 and T1 was reported at the electromyographic (EMG) examination. At three months the fracture united clinically and full neurologic recovery is detected at four months.

DISCUSSION

Tourniquets are widely used to maintain a bloodless field in limb surgeries but the potential complications should not be underestimated[2]. Nerve injury is the most common complication and can range from mild transient loss of function to irreversible damage and paralysis [3]. Although the pathophysiology of nerve injury associated with tourniquet use remains unclear, it is likely that both direct compressive forces under the tourniquet and neural ischemia play an important role [4].

To minimize adverse effects: the equipment inducing the tourniquet pressure should be regularly checked and calibrated; the pressure should be maintained as low as possible; a soft padded protection between the skin and the cuff should be used to prevent skin abrasions, blisters and breaks; and the tourniquet application time should be kept as short as possible [2,5]. The complications with tourniquets are less frequent if applied under direct supervision of experienced personnel. The preemptive analgesia is the introduction of an analgesic regimen before the onset of noxious stimuli, with the goal of preventing sensitization of the nervous system to subsequent stimuli that could amplify pain. However it was not a performed procedure in author’s operating room before, therefore the operating team was not familiar with it. With preemptive analgesia adequate analgesia is provided postoperatively and the doses of medications are lessened minimizing the side effects [6]. This is important in complicated patients such as those who chronically use narcotics as the presented patient.

Complications associated with regional anesthesia can occur even anesthesiologist takes every precaution to avoid them [7,8]. In a prospective survey conducted by Auroy et al [9]in which French anesthesiologists participated and based on voluntary reporting of major complications related to regional anesthesia, the occurrence of neurologic complications after the use of a nerve stimulator used for peripheral nerve blocks was remarkable. Also inadequate patient positioning insufficient physician experience and
non gentle technique were critical factors that increased the risk of neurologic complications.

In their letter to the editor, Eipe and Padhi[10] described prolonged neurological deficit in a diabetic patient after upper extremity surgery using a combined general-regional anesthetic technique. Although in that diabetic patient, an undiagnosed (subclinical) peripheral neuropathy was possible and a residual block couldn’t be completely ruled out, they concluded that this was tourniquet palsy.

In our case the lack of communication among the team led the wrong interpretation of postoperative neurologic signs of the patient and with the initial assumption of tourniquet palsy as the cause, this patient was not examined thoroughly although one should never overlook performing a systematical examination for each and every patient.

This case reminds the importance of communication and collaboration among surgeons and anesthesiologists and performing a sound physical examination of patient in every case without making any assumptions.

ACKNOWLEDGMENTS

This case report is presented as poster presentation at 23rd Turkish National Congress of Orthopedics and Traumatology held in Antalya, Turkey on October 29 – November 3, 2013.No support is obtained in financial or other manner. There are no conflicts of interest.

REFERENCES


*Corresponding author: Dr Aydın ARSLAN  
E-Mail: draarslan@hotmail.com