

New Approach to Brachial Plexus Block for Upper Arm Surgery

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ABSTRACT

This study was conducted in western Hospital and research centre Nepalgunj from 2007 to 2010. It was a prospective non randomized study consisting 250 patient of both sex and aged between 18 and 67 years with ASA (American Society of Anaesthesiologist) grade I and II scheduled for upper arm surgery. The subjects were given brachial plexus block on sitting position with their head tilted to opposite side of the block. In this technique 3 cm long 23 gauge needle was inserted from the point above clavicle to the lateral to subclavian artery pulsation, direction of needle was towards spinous process of 7th cervical vertebra. This procedure was done in 250 patients. Out of 250 patients 246 patients experienced paresthesia and pain relief after 20 ml solution (mixture of 5 ml 0.5% bupivacaine, 5 ml 2% xylocaine with adrenalin and 10ml normal saline). The onset of sensory block onset was observed to be 6.32±0.94 minutes and duration of sensory block was 2.5 to 4.2 hours. Similarly, the onset of motor block was 10.72±1.0 minutes and duration of action was 0.5 to 2.5 hours.

KEYWORDS: Brachial plexus block, supra clavicular approach, new approach.

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INTRODUCTION

Operations of the upper limb are generally performed under general anesthesia but due to high cost of anesthetic agents focus has been shifted towards regional anesthesia. Brachial plexus block is administered by various approaches¹ eg: supraclavicular, infraclavicular, interscalene and axillary route. The aim of this particular technique of brachial plexus block is to avoid the most serious complications which may occur with the supraclavicular block like pneumothorax and vascular injuries. The idea of this technique is to cannulate the neurovascular bundle with a needle from point of the upper edge of the clavicle in a slight upward direction, pointing towards spinous apophysis of c7 vertebra. By this way the occurrence of pneumothorax is avoided and furthermore the risk of accidental intra-arterial or intrathecal injection is negligible because of short size of the needle used (3 cm).

METHODOLOGY

250 patients of both sexes, aged between 18 and 67 years with ASA I and II scheduled upper arm surgery were selected for new approach to brachial plexus block. A well explained written consent was obtained from the patient's relative. All patients were kept nil orally for at least 6 hours before the

procedure. Patient's IV line was opened with 18 G IV cannula on opposite forearm and infusion of Ringer's Lactate was started. All resuscitative medicine and equipments were made available before the procedure.

Position and landmarks

The patients were made to sit upright on a stool, back supported by wall and head tilted to opposite side, in this way two clavicles fall and neurovascular bundle was raised. Pulsation of subclavian artery was marked and skin puncture was performed above clavicle lateral to the subclavian artery pulsation using a short (3 cm) 23 gauge needle. After intradermal injection of local anesthetic, the needle was directed approximately to the spinous apophysis of the c7 to provoke parasthesia. If the parasthesia was not provoked in this direction, the needle was drawn back to subcutaneous level and then the process was repeated pointing gradually towards the pedicle and body of c7. When patient felt parasthesia, anesthetist started to inject a solution of 20 ml mixture of anesthetic agent. But if parasthesia did not last during 3-4 ml of the injection the procedure was stopped immediately and parasthesia was provoked before continuing.

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Assessment of sensory and motor block

Assessment of sensory block was done by giving painful and cold stimuli. Assessment of motor block was done by asking movement of forearm. Onset of sensory block and motor block was observed every minute and recorded.

Complications

Out of 250 patients, four patients had no effect and they were given general anesthesia and they were not included in study. One patient had nonspecific chest pain after one hour at post-operative ward which was relieved by i.m single dose of diclofenec 75mg, there was no any respiratory complication and pleural puncture or any cardio respiratory side effects after plexus block.

RESULT

The age range of the patients was between 18 to 67 years (mean age = 44.22). In 246 patients out of 250 patients, the block was successful and did not require any supplement, whereas four patients needed general anaesthesia due to obesity (due to difficulty in identification of landmark they were not included in study), 10% patients complained of pain on the skin and were given supplementary axillary block. 40% of patients felt discomfort which was relieved by sedation with Buterphenol 1 mg and Midazolam 1 mg. Local infiltration of xylocaine at operative site was done in all cases.

Sensory block

Majority of the patients had pain relief immediately after injection of drug. Onset sensory block was 6.32 ± 0.94 minutes. Duration of sensory block was 2.5 to 4.2 hours.

Motor block

Onset of motor block was 10.72 ± 1.0 minutes. Duration of motor block was 0.5 to 2.5 hours.

DISCUSSION

Brachial plexus block has been given by various approaches namely, supraclavicular, intersclene, infrascapular, axillary and transcalene route¹ but due to high incidence of complications many new technique are practiced. Brand and Pepper² injected local anesthetic agent by Murphy's supraclavicular route but had incidence of pneumothorax in 6.1% patients. In another study by this route Pham Dang ET al³ observed asymptomatic phrenic nerve palsy, horner syndrome and transient recurrent nerve paralysis. Dupre et al and Hampel ET al⁴ also reported Horner syndrome in their

studies. Kumar et.al⁵ and Ross⁶ reported epidural and subdural blockage due to widespread distribution of anesthetic agent with interscalenous route.

In this technique as needle passes above clavicle lateral to subclavian artery chance on vessel puncture and pneumothorax is rare, hence it can be concluded this new approach is safe and effective with higher success rate. Moore⁷ discribed 1.5% incidence of pneumothorax. The anterior approach to the brachial plexus block names the "plumb-block" technique, was described for avoiding pneumothorax.⁸

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