Supraclavicular Brachial Plexus Block: A Simple Approach

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A total of 250 patients between the ages of 18-50 years who underwent upper limb surgeries were given supraclavicular brachial plexus block by lateral approach. In this technique a 5 cm long 22 SWG needle was inserted from a point 1 cm above the injection of inner 2/3 and outer 1/3 of clavicle directed medically, inwards and parallel to clavicle at an angle of approximately 20^0 to the skin. All the patients had pressure paraesthesia and immediate pain relief after 20 ml solution of mixture of 10 ml of 2% lignocaine, 6 ml of 0.5% bupivacaine and 4 ml normal saline was injected. Average onset and duration of analgesia was minutes and 180-200 minutes respectively. Average on set and duration of motor loss was 6-8 minutes and 120-150 minutes respectively 6% cases had vessel puncture but no serious complications were noticed. Quick and complete analgesia and motor loss with no serious side effect were the main features of this approach.

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Introduction

Generally operations on upper limb are performed under general anesthesia but due to increasing cost of anesthetic agents, associated sequel and the problems of operation theatre pollution, focus had been shifted towards regional anesthesia. Moreover postoperative pain relief is an added advantage, of regional techniques.

Brachial plexus block is administered by various approaches viz. supraclavicular, interscalenous, infraclavicular and maxillary routes but because of technical difficulties, inadequate blocks and high incidence of associated complications, an alternate lateral approach has been employed in eh present study, wherein the success rate and the associated complications have been evaluated.

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Methods

A total of 250 patients of both sexes between the ages of 18-50 years who wee posted for upper limb surgeries were administered brachial plexus block by this technique. A well explained written consent was obtained on the hospital consent form, from all the patients.

Preparation

All the patients were kept nil orally for at least 6 hours before procedure. Uniform premeditation of inj. Glycopyrrolate 0.2 ml I.M. was given 30 minutes before operation. Intradermal sensitivity test of lignocaine hcl and bupivacaine hcl was pefformed. Infusion of 5% dextrose was started with 18 SWG cannula.

Position

Patient was made to lie supine with head turned to opposite side and arm pulled down gently. A small pillow or folded sheet was placed below the shoulder to make the field more prominent.

Land Marks

A point 1 cm above the clavicle at a junction of inner 2/3 and outer 1/3 of the clavicle was chosen for the conduction of block.

Procedure

Under all aseptic precautions an intradermal wheat was raised with 1% lignocaine at the selected point. With anesthesiologist standing at the had end, slightly towards the side, a 5 cm long 22 SWG needle was inserted through the wheat directed medially and inwards at the angle of 20^0 to the skin, parallel to clavicle avoiding the external jugular vein till paraesthsia was elicited in the hand. After negative aspiration, a mixture of 10 ml lignocaine, hcl 2% 6 ml of bupivacaine. hcl 0.5% and 4 ml normal saline was injected slowly.

Almost all the patients had pressure paraesthesia during drug deposition. A gentle massage of the area was done with an idea to make uniform spread. All the patients were given inj. Pentazocine 30 mg and inj. Diazepam 5 mg intravenously for sedation.

Assessment of Sensory and Motor Block

Immediately after the injection of drug, patients were asked about the pain relief at fracture site and to move the upper limb to assess the sensory and motor blocks respectively. If required intermittent doses of katamine Hcl ($1mgkg^{-1}$) I.V. was given to supplement the anesthesia.

Results

Paraesthesia

Paraesthesia in upper limb was elicited in all the patients. Almost all the patients complained of severe pain in am during drug deposition (pressure paraesthesia).

Sensory Block

Majority of patients had pain relief immediately after injection of drug. 88% patients has complete analgesia within 3 minutes. Average duration of analgesia was 180-200 minutes. 15 patients (6%) complained about tourniquets pressure pain after 120 minutes but surgery could be performed after deflation of the cuff. 5 patients who had grade I analgesia required ketamine supplementation.

Motor Loss

Average onset time for complete motor loss was 6-8 minutes, with an average duration of 120-150 minutes. Few patients moved the hand especially fingers initially but later on complete motor loss was present in 86% cases.

Complications

Vessel puncture were found in 6% cases during the procedure but block could be

performed successfully in these patients once pressure stopped the bleeding.

No serious complications like pleural puncture, pneumothorax or any other cardio respiratory side effects were observed during the procedure. All the patients had a follow up of 6 months but no infection or neurovascular deficit was reported.

Discussion

Brachial plexus block has been given by various approachers, but due to high incidence of complications many modified techniques have been described. Brand and Pepper[1] injected local anaesthetic agent by Murphy's supraclavicular route but had 6.1% incidence of pneumothorax. In another study by this route Pham Dang et al[2] observed asymptomatic Phrenicx Nerve paralysis (60%), Horner's Syndrome (10%) and Transient Recurrent nerve palalysis. Dupre et al[3] and Hampel et al[4] also reported Horner's Syndrome in their studies. Kumar et al[5] and Ross[6] reported epidural and subdural blockade due to side spread distribution of anesthetic agent with interscalenous route. Axillary route results in preferential blockade of median and ulnar nerves.

In present study, lateral approach was used with an idea that as the needle passes from lateral to medial side at an angle of 20^0 to skin and parallel to clavicle, it will first meet the brachial plexus nerves eliciting the paraesthesia. In this study paraesthesia could be elicited in 100% cases as compared to 43% in Hamplel et al study. As the vessels lie medial to nerves, changes of piercing them are remote, one 6% cases had vessel puncture. In this approach needle is directed parallel to clavicle not inwards and downwards towards inlet, the incidence of pneumothorax is nil. Moore[7] described 1.5% incidence of pneumothorax.

Only 20 ml of drug solution was deposited at one place giving rise to quick and complete effect within 3-5 minutes, whereas patrich et al[8] used 30 ml with multiple pricks and Lanz[9] et al used 50 ml. superficial landmarks and eliciting of paraesthesia in all 100% cases resulted in higher success rate (98%) in our study. Moore et al and Dupre et al had 8% and 11% failure rates. Brand and Papper had 84.4% success rate.

Conclusion

Hence it can be concluded that supraclavicular brachial plexus block by lateral approach is safe and effective with higher success rate.

References

1. Brand Leanard, Papper EM. A comparison of supraclavicular and axillary techniques for brachial plexuxs block. Anesthesilogy 1961; 28: 226.
2. Pham Dang C, Gunst JP, Gouin F, Poirier P, Touchair S, Meunier JF, Kick O, Drouet KC, Bourreli B, Pinaund M. A novel supraclavicur approach to brachial plexus block. Anesth. Analg. 1999; 82: 111.
3. Dupre LJ, Danel V, Lagrand JJ, Stiegtiz P. Surface Landmarks for supraclavicular block of the brachial plexus. Anesth. Analg 1982; 61: 28.
4. Hampel V. Fink MV, Baumgartner E. A longitudinal supraclavicular approach to the brachial plexus for the insertion of plastic cannulas. Anesth. Analg 1982; 60 : 352.
5. Kumar A, Battit GE, Froese AB, Long MC. Bilateral Cervical and thoracic epidural blockade complicating interscalene brachial plexus block report of two cases. Anesthesiology 1997; 35 ¨651.
6. Ross S, Scaraborought CP. Total spinal anaesthesia following brachial plexus block. Anesthesiology 1973; 39: 548.
7. Moore DC, Regional block. A hard book for use in Clinical Practice of Medicine and Surgery. 4th ed Spring field 11 Charles C Thomas 1975; 221.
8. Patrick J. Technique of brachial plexus block anaesthesia. Br. J Surg 1940' 27 : 734.
9. Lanz E, Theirs D, Jankovic D. The extent of blockade following various techniques of brachial plexus. Anesth Analg 1983; 52 :55.