

68. CONTINUOUS LOW CERVICAL PARAVERTEBRAL BLOCK FOR SHOULDER SURGERY

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Objectives: To evaluate continuous low cervical paravertebral block (CCPVB) for the management of postoperative pain following major shoulder surgery.

Methods: In this prospective observational study, 56 consecutive consenting adult patients, scheduled for major shoulder surgery, were studied. After induction of anesthesia with propofol, maintenance of anaesthesia was with total intravenous anesthesia with propofol and remifentanyl, a laryngeal mask airway was inserted in all the patients and their lungs were mechanically ventilated with a mixture of air and oxygen to slight hypocapnea. No muscle relaxants were used and the low cervical paravertebral catheters (C6/7) (see Figure) were placed prior to the start of surgery using StimuCath™ (Arrow Int, Reading Pennsylvania, USA) catheters that were placed with the aid of a nerve stimulator set at an output of not less than 1 mA (200ms). Loss of resistance to air (LORA) was used in addition to nerve stimulation and solely (postoperatively) in 12 patients. All the postoperative catheters and 16 of the preoperative catheters were placed in patients who were awake.

After the catheter had been placed and tunneled to prevent catheter dislodgement as has been previously described¹, a bolus of 20 mL 0,5% ropivacaine was injected through the catheter, the catheter was further fixed with a StatLock® (Arrow Int., Reading, PA) and the catheter exit site was covered with a transparent plastic cover (Tagederm®). The patient was then positioned appropriately for the surgery. Special precautions were taken to prevent excessive traction on the arm and brachial plexus. On completion of the surgery a continuous infusion of 0,5% ropivacaine was initiated at an infusion rate of 5 mL per hour for females and 10mL per hour for males. For this a disposable elastometric infusion pump (Easypump®, B Braun, Germany), filled with 270 mL of the LA agent was used. Observations included pain estimation on a visual analog scale (0 – 10), movement at the hand wrist, elbow and shoulder on a scale of 0 – 5 (0 = zero movement and 5 = full movement), and signs of Horner's syndrome, recurrent laryngeal nerve paresis (hoarseness) and dyspnea (phrenic nerve paresis) were made directly postoperatively and at 24, 48 and 60 hours postoperatively.

Results: Average age of the patients was 55 ± 14.51 years (mean \pm SD) and male: female ratio was 18:38. The majority of the operations performed were arthroscopic rotator cuff repair (n = 16) while open rotator cuff repair (n = 10), capsulotomy for "frozen shoulder" (n = 12), SLAP repair (n = 4), arthroscopic Bankart repair (n = 4), sinovectomy (n = 2), ASAD (n = 6) and Mumford (n=2) made up the balance.

Pain scores were low throughout and distal motor function (hand and wrist) was better than proximal motor function (shoulder). Motor function improved with time (See table). No additional analgesics other than oral paracetamol containing compounds and intramuscular diclofenac 8 patients were required. Horner's syndrome was observed in 5 patients, recurrent laryngeal nerve was not paralyzed in any of the patients and two patients suffered mild dyspnea, probably due to phrenic nerve paralysis. Reassurance and oxygen therapy resolved the dyspnea in both these patients. Twelve of the patients complained of mild pain at the catheter exit site. This pain was treatable with oral analgesics or intramuscular diclofenac in all cases but one who suffered typical facet joint pain, which subsided after the catheter had been removed. Except for 5 patients all other patients reported 5/5 satisfaction. It did not seem to make any difference to the patient, nor to the complication or success rate, if the patient was anesthetized or not for the placement of the catheter.

Conclusions: Catheters for CCPVB were easy to place, had a high success rate and were associated with few and mild complications. Because of this, and the relative ease of the procedure and high patient acceptance and satisfaction, CCPVB should be considered as a routine block for the management of postoperative pain after major shoulder surgery. Due to the lack of block of the superficial cervical plexus, it should probably not be sufficient to use as sole anesthetic for shoulder surgery. Catheters can also be placed postoperatively without nerve stimulation (to prevent freshly sutured structures from being damaged by muscle contractions) by the use of the loss of resistance to air technique only². The relative preservation of motor function added to the comfort of the patients and the differentiation of muscle function (proximal < distal) helped to prevent injury to the freshly operated site due to muscle movement while offering the opportunity to early mobilization.

1. Boezaart AP de Beer JF, du Tot C, van Rooyen K. A new technique of continuous interscalene nerve block. *Can J Anesth* 1999; 46: 275 - 281.

2. Dagli G, Guzeldemir ME, Volkan Acar H. The effects and side effects of interscalene brachial plexus block by posterior approach. *Reg Anesth Pain Med* 1998; 23: 87 - 91

| | Pain (VAS 0 - 10) | Movement hand (0 - 5) | Movement wrist (0-5) | Movement elbow (0 - 5) | Movement Shoulder (0-5) |
|--------------------------|----------------------|--------------------------|-------------------------|---------------------------|----------------------------|
| Directly postoperatively | 0.45 \pm 0.7 | 4.3 | 4.0 | 2.6 | 1.2 |
| 24 hours Postoperatively | 0.65 \pm 1.22 | 4.6 | 4.4 | 3.7 | 2.4 |
| 48 hours postoperatively | 0.78 \pm 1.56 | 5 | 5 | 4.2 | 3.4 |
| 60 hours postoperatively | 1.98 \pm 2.25 | 5 | 5 | 5 | 5 |