Combination of regional anaesthetic techniques in a Duchenne Muscular Dystrophy carrier undergoing mastectomy

Sir,

Duchenne Muscular Dystrophy (DMD) is an X-linked recessive disorder caused by mutation in the dystrophin gene located on chromosome Xp21. Proximal muscle weakness is observed in early childhood with progression to respiratory distress and cardiomyopathy. Female genetic carriers though mostly asymptomatic often present with high plasma creatine kinase levels, variable degree of muscle weakness and rarely cardiac involvement like severe heart failure, left ventricular dilatation and cardiomyopathy. Volatile anaesthetics or neuromuscular blocking agents (depolarising) can trigger extreme hyperthermia, rhabdomyolysis, hyperkalemic cardiac arrests.[1]

Breast cancer being the most common cancer in India, accounts for 27.8% between the 25 and 49 age group.[2] The choice of anaesthesia in modified radical mastectomy (MRM) is most often general anaesthesia with or without regional blocks or the use of pre-emptive analgesics. The pain of breast surgery is often underreported or undertreated.[3]

A 34 year old, 76 kg female, a case of carcinoma left breast was scheduled to undergo MRM. The pre-anaesthetic check revealed the patient was a DMD gene carrier, diagnosed on family screening (as her brother was suffering from DMD). Past history was uneventful with a full-term normal delivery. The serum creatine kinase level was 1500U/L (N-22 to 198U/L). We planned a thoracic epidural anaesthesia (TEA) with ultrasound guided modified pectoral nerve (PEC type I and II) block with standard monitoring. The thoracic epidural catheter was inserted in sitting position in the T5-6 interspace. A total 10 ml of a titrated dose of 2% lignocaine with adrenaline (1:2,00,000) was injected over 10 minutes. The patient was made to lie down supine with hand abducted 90°, ultrasound guided scan was done using the linear high frequency probe in the parasagittal and para-median plane to identify the coracoid process and then identify the superficial pectoralis major and deeper pectoralis minor muscles [Figure 1]. The modified PEC block was administered between pectoralis major and pectoralis minor muscle (12.5 ml) to anaesthetise medial and lateral pectoral nerve in the vicinity of the pectoral branch of the thoracoacromial artery and subsequently 20 ml between pectoralis minor and serratus anterior muscle to anaesthetise the long thoracic nerve and intercostal nerve with 0.375% of Inj.ropivacaine and Inj. dexamethasone 4 mg. A sensory blockade T1-T7 was achieved within 15 min which we confirmed on a pin prick sensation. Inj.paracetamol 1 gm i.v. was given as a part of multimodal analgesia. 100% oxygen at rate of 4 L/min was administered via nasal cannula. Surgery lasted
Letters to Editor

for an hour and with stable vitals. Visual analogue scale (VAS) scores noted at end of surgery was 0. The analgesia lasted for 8 hrs. A 10 ml bolus of 0.1% Ropivacaine was administered twice a day for two days. The epidural catheter was removed on second post-operative day and patient discharged after five days.

TEA and thoracic paravertebral block (TPVB) are gold standard procedures as compared to systemic opioids for pain relief in major thoracic and abdominal surgeries. TPVB has complications like inadvertent vascular puncture (3.8-6.8%), epidual or intrathecal spread (1%), pleural puncture (0.8%), pneumothorax (0.5%), failure rate (6.1%), multiple punctures to anaesthetise similar dermatomes.[4]

Most articles have mentioned sole epidural or PEC block. Considering an epidural placed at T5-6, it is inadequate to cover the axilla and upper thoracic segments. The pectoral nerves are not covered with the epidural alone. Similarly, a sole PEC block has shown greater effect in reducing axillary pain, to reduce opioid consumption and lower pain intensity. Dexamethasone was added to prolong the drug effect and acts as anti-inflammatory. Since the nerve supply of breast tissue is complex with contributions from the brachial plexus, intercostal nerves and nerves crossing the midline to supply the opposite area (parasternal), combination regional anaesthesia technique is more appropriate than single technique in DMD carriers to mitigate the risks of general anaesthesia. There is limited literature to state this combination of TEA and PEC block to provide predictable surgical anaesthesia especially in cases with muscular dystrophy.

**Declaration of patient consent**
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**
There are no conflicts of interest.

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