Ashok et al. Ain-Shams Journal of Anesthesiology (2021) 13:9
https://doi.org/10.1186/s42077-021-00128-8

Ain-Shams Journal of Anesthesiology

CASE REPORT Open Access

# Erector spinae plane block (ESPB): an adjuvant multimodal analgesic in the Combined Mandibulectomy and Neck Dissection (COMMANDO)—a case report

Jadon Ashok[1*], S. Nair Abhijit[2], Sinha Neelam[1] and K. Shahi Prashant[1]

## Abstract

**Background:** The Combined Mandibulectomy and Neck Dissection (COMMANDO) surgery results in severe postoperative pain and requires multimodal analgesia (MMA) for its management. We speculated that the erector spinae plane block (ESPB) which is the ultrasound (US)-guided regional technique and has been used in various types of surgeries due to its analgesic benefits could be used as an effective analgesic adjunct in COMMANDO surgery.

**Case presentation:** We report a case of a 68-year-old female patient who underwent left side COMMANDO surgery for carcinoma cheek. She was given an ultrasound-guided left erector spinae plane block (ESPB) in the preoperative period with catheter insertion at T3 (3rd thoracic vertebral level). Two boluses of local anesthetic were given each with 10 ml 0.25% ropivacaine one before and one after surgery, and then, the infusion was started with a volumetric pump. The ESPB provided effective intraoperative as well as postoperative pain relief without any side effects.

**Conclusion:** US-guided ESPB could be used as a potential opioid-sparing multimodal analgesic in head and neck surgeries based on the pain relief provided and the spread of contrast on imaging. This hypothesis needs to be explored in the form of case series and adequately powered randomized controlled trials.

**Keywords:** Combined Mandibulectomy and Neck Dissection (COMMANDO), Head and neck cancer, Multimodal analgesia, Postoperative pain, Pain therapy

## Background

The COMMANDO (Combined Mandibulectomy and Neck Dissection) is a surgical procedure for the 1st-degree malignancy of the tongue or cheek. This surgery requires extensive tissue dissection and bone cutting leading to severe postoperative pain (Talmi et al. 2000). The combination of drugs including nonsteroidal analgesics and opioids (morphine) is often required due to the severity of pain (Bianchini et al. 2016). The erector spinae plane block (ESPB) is an ultrasound-guided interfacial plane block that has been reported to provide analgesia in various conditions (Pourkashanian et al. 2020). We have speculated that if the ESPB is used as a component of multimodal analgesia regimen, it can provide an effective analgesia in commando surgery. However, the role of ESPB in perioperative analgesia for COMMANDO surgery is still not published to our knowledge. Here, we report a case where ultrasound-guided ESPB was given at T3 (3rd thoracic vertebral level) on the side of surgery before the commencement of operation. The local anesthetic was injected through a catheter that helped in providing intraoperative as well as postoperative analgesia.

* Correspondence: jadona@rediffmail.com
[1]Department of Anaesthesia & Pain Relief Service, Tata Motors Hospital, Duplex-63, Vijaya Heritage phase-6, Marine Drive, Kadma, Jamshedpur 831004, India
Full list of author information is available at the end of the article

## Case presentation

A 68-year-old female was scheduled for commando surgery on the left side for buccal carcinoma after a proven biopsy report (squamous cell carcinoma stage T2-N0-M0). The patient was hypertensive, and the blood pressure was well controlled with nifedipine 10 mg twice daily dose. All relevant investigations were unremarkable. As per hospital protocol, during the preoperative visit, an informed consent was taken for the surgery and the anesthesia technique involved including ESPB. She was also taught about the reporting of pain on 0–10 scale through sign language (0 = no pain and 10 = excruciating pain). An intravenous line was secured, and the injections metoclopramide 10 mg and ranitidine 50 mg were given intravenous (IV) 1 h before the operation. In the operation room, vital monitors were connected. With due aseptic precaution and the sterile technique, left ESPB was given at T3 in a sitting position. A high-frequency linear probe (13-6 MHz, SonoSite M-Turbo) was placed in the parasagittal plane 2.5 cm lateral to the mid line over T3 transverse process. An 18G Tuohy needle was inserted from caudal to a cephalic direction (Fig. 1a). After correct localization and linear spread of 2 ml saline under the erector spinae muscle, 10 ml 0.25% ropivacaine was injected followed by the insertion of 18 G epidural catheter (Fig. 1b). The position of the catheter was confirmed, and another bolus of 10 ml 0.25% ropivacaine was injected after tunneling and fixing the catheter. After 15 min, sensory changes to cold were noticed on the anterior, lateral, and posterior chest wall from C4–T6. A standard general anesthesia with appropriate doses of IV fentanyl, propofol, and vecuronium was used, and the airway was secured with an armored nasotracheal tube (7 mm internal diameter). Surgery was done with a pectoral flap (Fig. 1c), and the surgery lasted for 9 h and 30 min. The patient remained clinically stable (SPI, surgical pleth index 24–28) and required only 150 μg of fentanyl (40% of the expected dose) and 1 g of paracetamol IV. At the end of the operation, 10 ml 0.25% ropivacaine and 4 mg dexamethasone were given through catheter and an infusion (0.1% ropivacaine and 0.8 μg/ml fentanyl) was started @ 6 ml/h with an elastomeric Pump (DOSI-FUSER®). IV paracetamol 1 g 8 hourly was continued, and rescue analgesia with 50 mg IV tramadol (as required) was planned. However, the patient did not require any rescue analgesia and remained pain-free (pain score 0–2) throughout the postoperative period. Due to prolonged surgery, the patient was electively ventilated overnight (from 9 PM to 6 AM) and extubated the

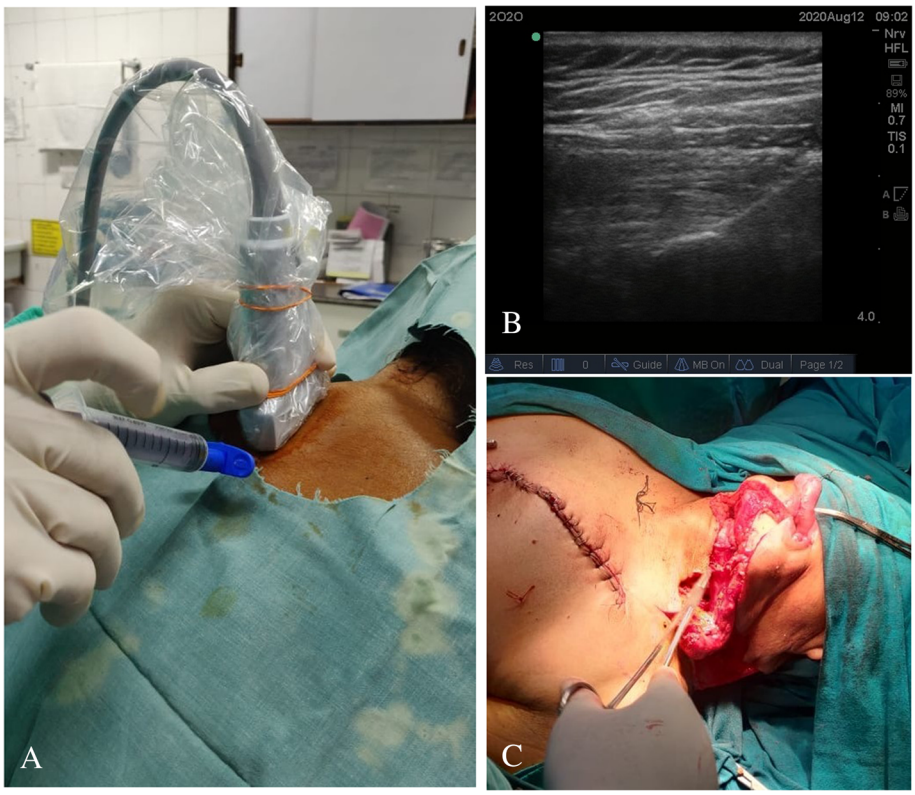


**Fig. 1** **a** High-frequency ultrasound probe is in the parasagittal plane 2.5 cm lateral to mid line over T3 transverse process and 18G Tuohy needle inserted from caudal to cephalic direction. **b** Sonoanatomy, needle is resting at T3 transverse process and catheter in emerging through it. **c** Sutured surgical site of pectoral flap and facial wound is being sutured

next day morning. During ventilation, sedation was provided by infusion of dexmedetomidine 0.5 μg/kg/h. The erector spinae catheter was removed after 3 days of surgery. However, before the removal of the catheter, a computerized tomography (CT) with 3D reconstruction was done using a 10-ml mixture of ropivacaine 0.5% 5 ml and 5 ml contrast (Omnipaque-300) injected through the catheter. It showed the spread of contrast from T5 to C2. The contrast was also seen spreading near intervertebral foramen at 2–3 levels (Fig. 2a–d).

## Discussion

Commando surgery is associated with severe postoperative pain. The multimodal analgesia (MMA) regimen, where two or more than two drugs or approaches for pain relief are used together, is the current practice to manage postoperative pain after commando surgery. However, most of the reports suggest that the management of acute postoperative pain is still sub-optimal (Mom et al. 1996; Ziv et al. 2006). Therefore, there is still a scope to investigate newer drugs or techniques to improve further upon the postoperative pain control in head and neck surgery. ESPB is a novel ultrasound-guided facial plane block. It was used the first time for a neuropathic pain in the rib (Forero et al. 2016). Due to the simplicity of the procedure, it became popular as a multipurpose regional block (Kot et al. 2019; De Cassai et al. 2019). Two recently published case reports have suggested that ESPB is effective to provide analgesia in a painful malignant condition of the face and esophagus (Jadon et al. 2019; Jadon et al. 2020). The suggested mechanism of pain relief was the spread of local anesthetic on the spinal nerves as the spread could be seen near the intervertebral foramina and the effect on the sympathetic nervous system through stellate ganglion. On the basis of published literature, we speculated that ESPB can provide analgesia in commando surgery as well. It may not block the pain sensation from the face as the face is supplied with cranial nerves. However, it will block the pain arising from excessive tissue dissection done during muscle harvesting and also pain arising from chest and neck area. We observed that in the present case, ESPB as a component of the multimodal analgesia was able to reduce the analgesic requirements. Therefore, only injection paracetamol along with ESPB was sufficient enough

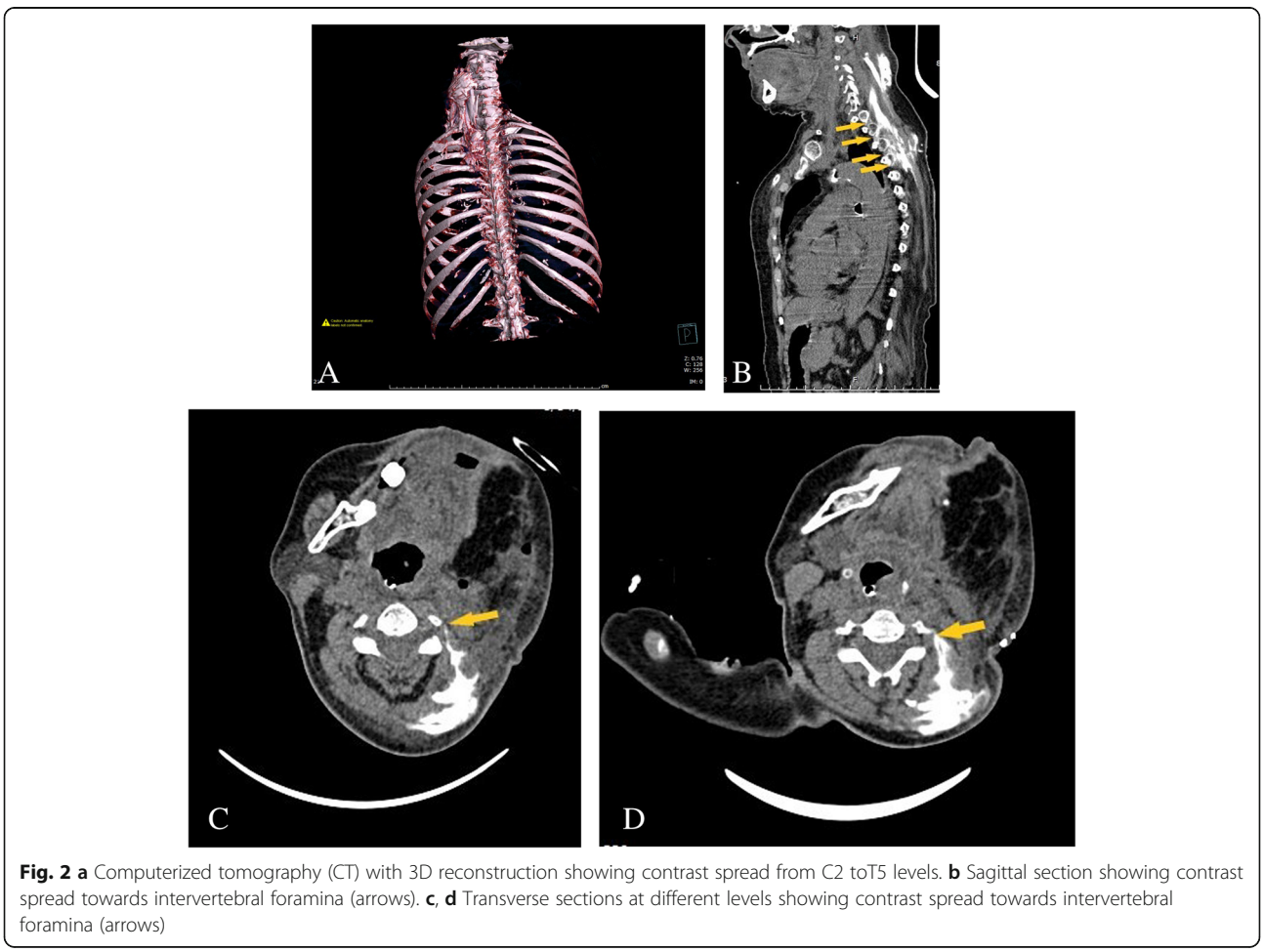


**Fig. 2** **a** Computerized tomography (CT) with 3D reconstruction showing contrast spread from C2 toT5 levels. **b** Sagittal section showing contrast spread towards intervertebral foramina (arrows). **c**, **d** Transverse sections at different levels showing contrast spread towards intervertebral foramina (arrows)

to provide effective pain relief. The long duration of surgery contributes to the severity of pain as suggested by Inhestern et al. (Inhestern et al. 2015). In our case, the surgery was prolonged (9.30 h). However, ESPB provided an effective intraoperative and postoperative analgesia as a requirement of intraoperative fentanyl was reduced with stable hemodynamic and NRS remain < 3 throughout the postoperative period.

The mechanism of action of ESPB is not well understood. The cadaveric studies have shown a variable spread of contrast involving only dorsal ramus or spread up to ventral ramus including paravertebral spread (Ivanusic et al. 2018). A recent study has shown the potential use of cervical ESPB in cervical and shoulder surgery due to contrast spread towards cervical roots and brachial plexus (Elsharkawy et al. 2020). In our case, excellent analgesia can be explained by contrast spread from C2 toT5 levels and also encroaching to intervertebral foramina at 2–3 levels (Fig. 2b–d). We inserted the catheter at T3 and directed upward. Tusi et al. showed that the spread toward cervical roots can be achieved even with the insertion of the catheter in the thoracic area (Tsui et al. 2019). The limitation of this case report is the "single case," and validation of technique may require more such cases. However, previous case reports where ESPB was used to manage the pain due to malignancy of the face and esophageal and the present case opens an avenue of possibility to explore further the use of ESPB for such clinical situations.

## Conclusion

Ultrasound-guided ESPB can provide effective analgesia as an adjunct to multimodal analgesia regimen for surgeries like Combined Mandibulectomy and Neck Dissection (COMMANDO). However, the usefulness of ESPB in head and neck surgeries needs to be explored in the form of case series and adequately powered randomized controlled trials.

### Abbreviations

@: At the rate of; COMMANDO: Combined Mandibulectomy and Neck Dissection; CT: Computerized tomography; ECG: Electrocardiograph; ESPB: Erector spinae plane block; LA: Local anesthetic; MMA: Multimodal analgesia; NRS: Numeric rating scale; SPI: Surgical pleth index; US: Ultrasound

### Acknowledgements

Dr. Prasanna Dora, Senior Consultant, Department of Surgery, Tata Motors Hospital

### Authors' contributions

AJ: concept, intervention, manuscript writing, final draft. AN: editing, review, final draft. NS: intervention, review of literature, editing. PS: review of literature, observation, editing. The authors have read and approved the final manuscript.

### Funding

No external or other funding is involved for declaration.

### Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

### Ethics approval and consent to participate

Written approval from the Tata Motors Hospital Ethical Committee was taken (7th September 2020, Ref.# Anaesth./001-09/2020), and consent to participate from the patient was taken.

### Consent for publication

Written informed consent to present, discuss, and publish the patient's medical information, management details, and pictures was taken.

### Competing interests

The authors declare that they have no competing interests.

### Author details

[1]Department of Anaesthesia & Pain Relief Service, Tata Motors Hospital, Duplex-63, Vijaya Heritage phase-6, Marine Drive, Kadma, Jamshedpur 831004, India. [2]Department of Anesthesiology, Basavatarakam Indo-American Cancer Hospital and Research Institute, Hyderabad 500034, India.

Received: 23 October 2020 Accepted: 12 January 2021
Published online: 29 January 2021

### References

Bianchini C, Malago M, Crema L et al (2016) Post-operative pain management in head and neck cancer patients: predictive factors and efficacy of therapy. Acta Otorhinolaryngol Ital 36:91–96

De Cassai A, Bonvicini D, Correale C, Sandei L, Tulgar S, Tonetti T (2019) Erector spinae plane block: a systematic qualitative review. Minerva Anestesiol 85: 308–319

Elsharkawy H, Ince I, Hamadnalla H, Drake RL, Tsui BCH (2020) Cervical erector spinae plane block: a cadaver study. Reg Anesth Pain Med 45:552–556

Forero M, Adhikary SD, Lopez H, Tsui C, Chin KJ (2016) The erector spinae plane block: a novel analgesic technique in thoracic neuropathic pain. Reg Anesth Pain Med 41:621–627

Inhestern J, Schuerer J, Illge C et al (2015) Pain on the first postoperative day after head and neck cancer surgery. Eur Arch Otorhinolaryngol 272:3401–3409

Ivanusic J, Konishi Y, Barrington MJ (2018) A cadaveric study investigating the mechanism of action of erector spinae blockade. Reg Anesth Pain Med 43: 567–571

Jadon A, Rastogi S, Sinha N, Amir M (2019) Use of erector spinae plane block in the management of pain from metastatic cancer of the face in a terminally ill patient. Indian J Anaesth 63:675–677

Jadon A, Sinha N, Singh B, Agrawal A, Ahmad A (2020) Erector spinae plane block (ESPB) to manage pain of carcinoma esophagus – a case report. J Anesthesia Forecast 3:1008

Kot P, Rodriguez P, Granell M et al (2019) The erector spinae plane block: a narrative review. Korean J Anesthesiol 72:209–220

Mom T, Commun F, Derbal C et al (1996) Postoperative pain evaluation in the surgery of head and neck cancers. Rev Laryngol Otol Rhinol 117:93–96

Pourkashanian A, Narayanan M, Venkataraju A (2020) The erector spinae plane block: a review of current evidence. Update in Anaesthesia 35:27–33

Talmi YP, Horowitz Z, Pfeffer MR et al (2000) Pain in the neck after neck dissection. Otolaryngol Head Neck Surg 123:302–306

Tsui BC, Mohler D, Caruso TJ, Horn JL (2019) Cervical erector spinae plane block catheter using a thoracic approach: an alternative to brachial plexus blockade for forequarter amputation. Can J Anesth 66:119–120

Ziv G, Darryl B, Nissim M et al (2006) Treatment of pain after head and neck surgeries: control of acute pain after head and neck oncological surgeries. Otolaryngol Head Neck Surg 135:182–188

## Publisher's Note