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Case report

Ultrasound guided interscalene block is a safe technique in neck breathers☆

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Abstract Regional anaesthesia is challenging in surgical patients with anatomical abnormalities. Patients who have undergone total laryngectomy have a permanent tracheostomy, and these individuals are termed as neck breathers. These patients have distorted anatomy due to radiation and chemotherapy. We are report the successful management of a neck breather with distorted neck anatomy for surgery of the arm with an ultrasound guided interscalene block.

1. Introduction

Regional anaesthesia may be challenging in surgical patients with anatomical abnormalities. Patients who have undergone total laryngectomy have a permanent tracheostomy. There is no longer a connection between the trachea and the mouth, and these individuals are termed as neck breathers. These patients have distorted anatomy due to radiation and chemotherapy. When such patients require incidental surgery, they present a peculiar problem to the anaesthesiologist. There are only two reports of ultrasound guided regional blocks in such patients [1,2]. We are the first to report the successful management of a neck breather with distorted neck anatomy for surgery of the arm with an ultrasound guided interscalene block.

2. Case report

A 67 year old male patient presented to us a fracture of the shaft of left humerus and was posted for fixation of the fracture. He had undergone total laryngectomy in 2001 for treatment of carcinoma larynx, followed by chemotherapy and radiation to the neck. A permanent tracheostomy with voice prosthesis was present (Fig. 1). He was a hypertensive, on Tab Amlodipine 5 mg OD since 10 years. He was diagnosed with ischaemic heart disease 8 years ago and was on Tab Aspirin 75 mg OD. Examination revealed a permanent tracheostomy at C4–C5 level, and the surrounding tissues were fibrosed, restricting neck movements. He had coarse crepitations on the left lower lung regions, and room air saturation was 92%. Systemic examination was otherwise unremarkable.

Electrocardiogram revealed old ischaemic changes, further evaluation with echocardiography showed hypokinetic

☆ In patients with altered anatomy ultrasound guidance for regional anaesthesia is a safe technique.

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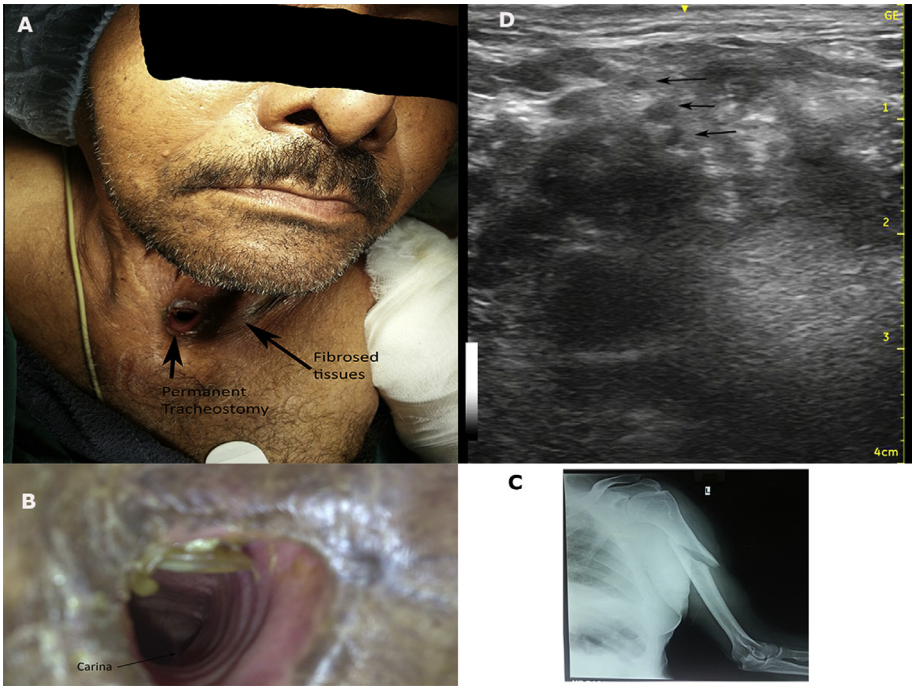

Figure 1 (A) Patient with permanent tracheostomy and surrounding fibrosis, (B) voice prosthesis, tracheal rings and carina visualised, (C) X-ray showing fracture humerus and (D) pre-block scan; arrows showing Brachial plexus between the scalene muscles.

left ventricle, with ejection fraction of 0.4. Chest X-ray revealed left parahilar opacity and his serum creatinine was 1.66 mg/dL.

Patient was optimised with antibiotics, nebulisations and physiotherapy for two days before surgery. He was premedicated with tablet Ranitidine 150 mg and glycopyrrolate 0.2 mg intramuscularly on the morning of surgery.

In the theatre, monitoring was initiated and intravenous access was established with an 18G cannula on the right upper limb. Gentle suctioning of tracheal secretions was done and oxygen was administered by a paediatric face mask applied over the stoma. Fentanyl 30 micrograms (mcg) was administered intravenously before commencing the brachial plexus block. The patient was instructed clearly to signal to the anaesthesiologist by lifting up his right hand in case of any difficulty.

Using an ultrasound (USG) probe, the brachial plexus was identified in the interscalene groove. Despite the fibrosed sternocleidomastoid muscle and altered anatomy owing to radiation, the sonoanatomy was not altered much (Fig. 1). An ultrasound guided interscalene block was given using a 22G 50 mm insulated needle with 30 mL of 0.5% ropivacaine with 500 units of hyaluronidase and 50 mcg clonidine. Complete sensory block ensued in 8 min and motor blockade of the arm occurred at 12 min. No further analgesics/sedatives were needed.

The quality of anaesthesia was excellent and the duration of surgery was 1.5 h. He remained hemodynamically stable throughout the procedure and was shifted out to the ward post-operatively. The motor block lasted for 12 h and sensory block for about 13 h. He had an uneventful recovery and discharged after a week.

3. Discussion

Anaesthesia for incidental surgery is challenging for neck breathers. Anaesthesiologists caring for these patients perioperatively are not familiar with their unique anatomy as we rarely come across such patients [3]. Among all tracheostomies encountered, patients with a permanent airway stoma may be seen in 1 in 20–30 [4]. In the absence of adequate humidification, the trachea develops chronic inflammatory changes, and squamous metaplasia. These patients are also prone to chronic lower respiratory tract infections due to increased sections and repeated [5]. Handling the airway in cases where voice prostheses are present is hazardous as this may lead to aspiration of the prosthesis which can block the lower tracheobronchial tree [5,6]. Some patients may need revision of the stoma prior to incidental surgery and manipulation of their airways.

Radiation induces oedema with subsequent fibrosis or necrosis in the exposed tissues [7]. Altered consistency of neck tissue presents as firm or woody mass and skin tethering, effectively masking the anatomical landmarks needed for conventional regional anaesthesia or central venous access [8]. Neck and shoulder stiffness results commonly in these patients due to surgery, neck dissection and external brachytherapy [9]. The anatomy of the brachial plexus also gets distorted and regional technique by conventional methods can be difficult in such patients [10].

On review of literature we could find only two cases reported the first one where secondary to radiotherapy, the patient had cervical and facial abnormalities that had altered the external anatomical landmarks. The patient had a fractured right humerus and was successfully managed with

an ultrasound guided interscalene brachial plexus block [1]. In the other case the authors highlight the significance of pre-procedure ultrasound scan before successfully performing a brachial plexus block in a patient with previous major neck, chest and arm injuries [2].

Our patient had an altered neck anatomy with multiple co-morbidities. He posed five main challenges to us; altered neck anatomy, tracheal instrumentation were unpredictable, poor left ventricular function, an active lower respiratory tract infection and communication were difficult. A regional technique was opted over general anaesthesia as the benefits outweighed the risks. In case of failure of the regional technique, preparations were kept ready for emergency intubation, with tracheostomy tubes, reinforced endotracheal tubes and airway exchange catheters.

As the fracture involved the shaft of humerus, we decided to give an interscalene block using ultrasound guidance. Ultrasound guidance is rapidly becoming the gold standard, it has improved safety and efficacy of regional anaesthesia [11], it is especially useful in patients with altered anatomy [1,2]. We used a large volume of local anaesthetic mixture and hyaluronidase as an additive to promote good spread of the anaesthetic in view of poor spread due to fibrosis. Clonidine was used to prolong the duration of analgesia.

Neck breathers with associated altered neck anatomy are a challenge to the anaesthesiologist. Our case was successfully managed with ultrasound guided interscalene brachial plexus block as a sole anaesthetic technique, totally avoiding the airway complications and post-operative ventilation. We conclude that an ultrasound guided interscalene brachial plexus block is a safe technique in neck breathers with altered neck anatomy.

Conflict of interest

There is no conflict of interest.

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