

Open reduction and internal fixation of distal humerus fracture in ASA 4 E patient under sole regional Anaesthesia

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Abstract

Presentation

We present a case of 76 year old female patient presented for open reduction and internal fixation of her left distal humerus fracture on weekend trauma list.

Diagnosis

She had background history of progressive pulmonary fibrosis was on home Oxygen therapy, Carcinoma of breast metastasis to spine, ribs , liver parenchyma and long bones in her body. General anaesthetic with intubation and mechanical ventilation in this ASA4E patient would place her at high risk of perioperative morbidity and mortality.

Treatment

Left sided supraclavicular Brachial plexus block performed under ultrasound guidance-20mls 0.5 % bupivacaine was injected. Adequate Anaesthesia achieved after 25 minutes of block. Patient was started on Propofol target control infusion at 0.5 mics/mil. Successful surgery performed and patient was shifted to ward on same day.

Discussion

Regional Anaesthesia skills are very important for our day to day practice. We routinely use supraclavicular block for intra operative and post operative analgesia but we used this block as sole Anaesthesia for this patient.

Introduction

In this report, we describe an elderly woman with an idiopathic progressive pulmonary fibrosis requiring an orthopaedic upper extremity surgery.

Case Report

A 77-year-old woman with progressive pulmonary fibrosis presented for an emergency open reduction and internal fixation (ORIF) of a left distal humerus fracture after a fall from her wheelchair. Her past medical history was significant for idiopathic pulmonary fibrosis, bronchiectasis, hypertension, ischaemic heart disease and breast cancer post chemotherapy and radiotherapy with multiple osseous metastasis. She was sensitive to multiple drugs – ciprofloxacin, penicillin, nitrofurantoin, trimethoprim, olmesartan, perindopril and ramipril. Her regular medications included dexamethasone, bumetanide, loratadine, rosuvastatin, ezetimibe, nintedanib, paracetamol and pantoprazole.

Figure 1: X ray of the left humerus fracture on presentation

Figure 2: Xray of the left humerus after fixation



On examination, she had coarse crackles and wheeze throughout the lungs and oxygen saturations were 94% on room air. Arterial blood gas on room air showed pH of 7.49, pCO₂ of 4.42 kPa, pO₂ 30.3 kPa, HCO₃⁻ 26.1 mmol/l and base excess of 1.5 mmol/l. Her most recent pulmonary function test (PFT) available appeared to be improved in comparison to her previous PFTs. Her forced vital capacity (FVC) was 1.72 (94% predicted), forced expiratory volume (FEV₁) was 1.21 (77% predicted) with low FEV₁/FVC ratio of 70%. Her DLCO (Diffusing capacity of the lungs for Carbon Monoxide) was 2.81 (47.7% predicted).

Her recent CT Thorax, two and a half weeks prior to the surgery suggested progressive bilateral asymmetrical pulmonary fibrosis with apical basal gradient. There was presence of honeycombing with traction bronchiectasis in both lower lobes, worse on the left side. Due to the progressive nature of her disease, we did not consider it safe for her to have general anaesthesia. The ARISCAT Score for postoperative pulmonary complications (PPC) for this patient was calculated to be 35 points which made her at an intermediate risk of in-hospital PPCs. The incidence of PPCs in major surgery ranges from <1 to 23%. Many studies have shown that cardiac complications are not as common as the respiratory complications and postoperative respiratory failure is the most common PPC.¹

Prior to moving forward with the supraclavicular brachial plexus block as a sole technique. The complications were discussed with the patient as well as the anaesthesia team. Some of the complications related to the supraclavicular block are phrenic nerve block with diaphragmatic paralysis, hematoma, pneumothorax and horner's syndrome.² Patient had a full understanding of the complications and then consented to the supraclavicular block with sedation.

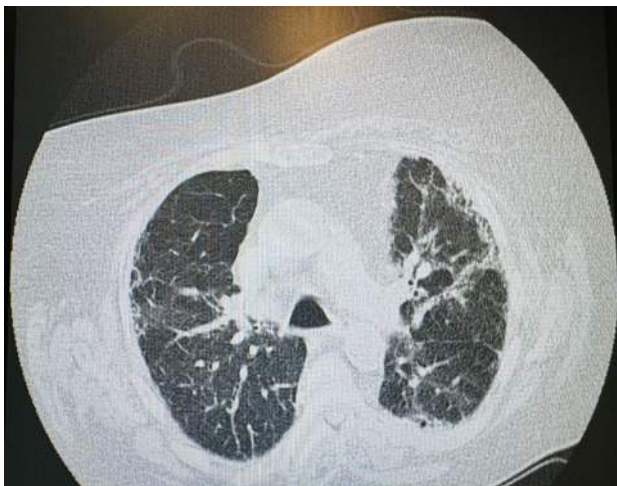
The left distal humerus ORIF was carried out successfully after performing an ultrasound-guided supraclavicular brachial plexus block. Left supraclavicular brachial plexus block was performed under ultrasound guidance – 20mls 0.5 % bupivacaine was injected with a 50mm block needle. Adequate anaesthesia was achieved after 25 minutes of the block. The patient was monitored with electrocardiogram, invasive blood pressure and pulse oximetry. Even though the block was checked before the start of the surgery, we had the theatre ready for conversion to general anaesthesia in case the patient felt pain or discomfort from the surgery at any point. Help was available immediately. The patient was started on propofol target control infusion at 0.5 mcg/ml. She was provided with oxygen through a venturi mask at 6L/min flow. Vitals throughout the surgery were stable. After the surgery the patient was shifted to the recovery room for observation and then transferred to the ward within an hour. Postoperative x-ray was performed once the patient reached the ward and a pneumothorax was ruled out. The patient had no other side effects of the supraclavicular block.

Discussion

At our institution, regional analgesia is routinely performed for upper limb surgeries in addition to general anaesthesia. However, regional anaesthesia as the sole technique for an upper limb surgery is not common. We provide general anaesthesia for patient who require lateral positioning. Due to the patients extensive cardiac and pulmonary disease history, the patient was deemed unsuitable for general anaesthesia and we opted for regional anaesthesia with sedation.

Restrictive lung diseases are a heterogeneous set of pulmonary disorders defined by restrictive patterns on spirometry. These disorders are characterized by a reduced distensibility of the lungs, compromising lung expansion, and, in turn, reduced lung volumes, particularly with reduced total lung capacity (TLC).³ Pulmonary fibrosis is an intrinsic restrictive lung disease that the patient was diagnosed with multiple years ago as an incidental finding when a calcium scoring scan was performed for her heart.

Fig 2: High Resolution CT Thorax 2 weeks prior to the surgery



Respiratory complications are the most common after anaesthesia and can have a serious effect on the patient's recovery and their subsequent health.⁴ Therefore, a regional anaesthesia technique which would provide surgical anaesthesia was preferred. An ultrasound-guided supraclavicular brachial plexus block would provide adequate analgesia and anaesthesia for the ORIF of the distal humerus. Intravenous propofol was used for intraoperative sedation. The patient did well during and post-surgery, avoiding general anaesthesia. She had good postoperative analgesia.

As shown in this case, it is important to select an appropriate regional anaesthesia technique for a patient who has progressive pulmonary fibrosis and needs to undergo upper extremity surgery to provide adequate operative anaesthesia and postoperative analgesia. Regional anaesthesia skills have become an important skillset for an anaesthesiologist to successfully manage patients with respiratory co-morbidities having an upper limb surgery.

Declarations of Conflicts of Interest:

None declared.

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