

Regional Anaesthesia for Parathyroidectomy-Expanding the Horizon

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Abstract

A 75-year-old lady, weighing 23kg, presented with midshaft fracture of left humerus. She had cervical and thoracic kyphoscoliosis, with multiple level cervical IVDP. On further evaluation, hypercalcaemia due to right inferior parathyroid adenoma was found. After initial medical management, she was planned for right inferior parathyroidectomy under general anesthesia. Considering the inherent high risk and lack of consent for general anesthesia, the patient underwent right inferior parathyroidectomy and right hemithyroidectomy under bilateral superficial cervical plexus block. Postoperatively, hungry bones syndrome was managed with intravenous calcium infusions and she was discharged on 8th postoperative day.

Keywords: Primary hyperparathyroidism; kyphoscoliosis; superficial cervical plexus block.

INTRODUCTION

Primary hyperparathyroidism resulting from a parathyroid adenoma or hyperplasia, is the most common cause of hypercalcaemia.¹ 80% of primary hyperparathyroidism is due to a solitary benign adenoma. The only curative therapy is parathyroidectomy, via the standard cervical exploration or minimally invasive approach.² Initial medical management comprises hydration, hypercalcaemia correction and other supportive measures like diuretics, bisphosphonates and calcitonin.

The involvement of all body systems calls for patient specific tailor-made conduct of anaesthesia.³

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Parathyroidectomy has been performed under general anaesthesia, superficial cervical plexus block, combined superficial and deep cervical plexus blocks, local anaesthesia, with or without sedation.^{2,4,5}

CASE REPORT

On admission, her blood investigations revealed serum PTH value of >2000pg/mL, serum phosphorus of 2.4mg%, calcium 11.8mEq/L albumin of 3.1mg%. ECHO showed concentric left ventricular hypertrophy with stage 1 left ventricular dysfunction, aortic sclerosis and mild pulmonary hypertension. The inherent risks of the surgery due to the advanced age, compromised cardiac and respiratory status versus the invariably deteriorating status due to hypercalcaemia, were extensively discussed by a panel of doctors comprising of the anaesthesiologist, endocrine surgeon, endocrinologist, cardiologist and pulmonologist. However, the family withdrew consent for surgery and requested discharge against medical advice.

As a last measure, they were given the option of attempting the procedure under sole regional



anaesthesia, to which they agreed, provided general anaesthesia would be avoided at any cost.

Preoperatively, she was administered 60ml normal saline hourly during the fasting period. The patient was shifted from the ward to the theatre with utmost care to prevent further stress on the patient's already osteoporotic bones. In the operating room, a good 18G peripheral venous access was established. The right radial artery was cannulated under local anaesthesia for real time BP monitoring and frequent blood sampling. An initial heart rate of 90/min, invasive BP of 168/99mmHg and room air saturation of 96% were recorded.

After administering 0.5mg of Midazolam and 15µg of Dexmedetomidine in titrated doses, oxygen was administered via Hudson mask at 5L/minute. Bilateral ultrasound guided superficial cervical plexus block was done with 8mL of block solution on each side. The solution was prepared by mixing 5mL 2% Lignocaine with 1 in 2 lakh Adrenaline, 9mL 0.5% Bupivacaine and 2mL 8mg Dexamethasone. The patient was free of pain on pinching the incision site with toothed thumb forceps after 5 minutes. Paracetamol 340mg intravenously was given in addition. Forced air warmer was placed at the foot end to avoid hypothermia.

The patient was maintained in supine position with the head in neutral position to avoid strain on the cervical spine. The surgical site was painted and draped ensuring that the drapes were tented over the face to avoid any claustrophobia. The patient was pain free. An additional dose of 5µg Dexmedetomidine was given and spontaneous ventilation was maintained. Mean arterial pressure was maintained at the baseline value throughout.

The large size of the adenoma required wide exposure necessitating splitting of the strap muscles of neck. The close relation of the thyroid gland to the adenoma hampered the separation of structures. Hence, right hemithyroidectomy and right inferior parathyroidectomy were done. Intraoperative serial blood sampling revealed significant fall in serum PTH levels (pre-excision PTH- >2000pg/mL; post excision PTH- 32.4pg/mL). The entire surgical procedure lasted 140minutes, with a blood loss about 30ml.

Postoperatively, the patient was kept in post anaesthesia care unit and closely observed for signs and symptoms of hypocalcaemia. Serially declining calcium levels were corrected with intravenous calcium supplements and she was discharged on oral calcium. Pain was completely controlled with 8th hourly weight adjusted doses of

intravenous Paracetamol. Once daily subcutaneous dose of 0.25mL low molecular weight heparin was started on post operative day 2. Biopsy revealed parathyroid carcinoma with follicular nodular disease in the thyroid.

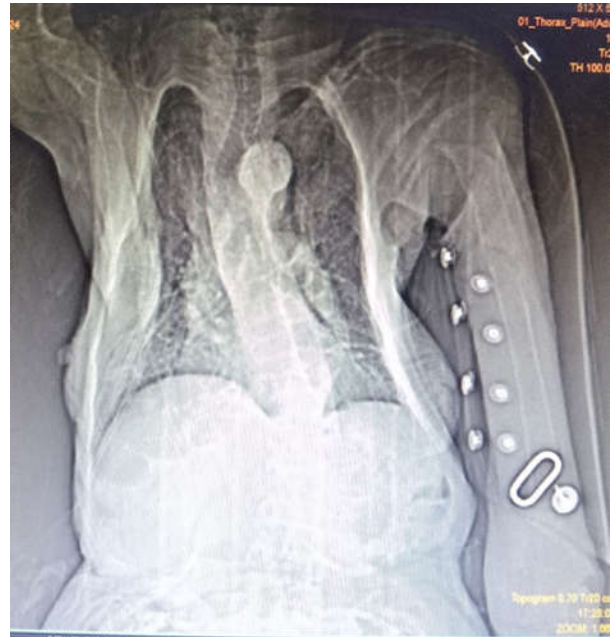


Fig. 1: CT Topogram showing cervical and thoracic scoliosis, tracheal deviation and left humerus fracture

DISCUSSION

The advancements in biochemical assays have paved way for early diagnosis of hypercalcaemia in the western world.⁶ The classical triad of 'moans, groans and stones' are less commonly seen currently. However, in India, routine calcium screening is not done and patients may first present with advanced disease.⁵ Our patient was diagnosed with parathyroid adenoma causing pathological fracture at the age of 75 years, despite the progressive kyphoscoliosis, prompting the necessity of high index of suspicion in fractures due to minimal force.

Fibreoptic bronchoscopic intubation, despite being the gold standard of difficult airway,^{7,8} had serious limitations in this case. Our patient weight of 23kg meant that the safe dose of lignocaine would be attained with merely a single nebulisation with 4mL of 4% Lignocaine or a 4mL viscous Lignocaine gargle. Lack of proper airway topicalization could cause airway trauma and stress response, which would have been seriously detrimental in our already compromised patient.⁹

Performing a head and neck surgery under spontaneous ventilation carries the dreaded risk of venous air embolism.¹⁰ The unwillingness for general anaesthesia left us with no choice. The favourable outcome, however, was the ability to monitor for stridor continuously intraop by listening to her breath sounds, precluding any intraoperative neuromonitoring or check laryngoscopy at the end of the procedure.^{11,12}

CONCLUSION

The profound effects of primary hyperparathyroidism on the normal physiological milieu poses numerous perioperative challenges.^{2,3} With adequate planning and preparation, parathyroidectomy can be performed under sole regional anaesthesia, in cooperative patients at high risk of complications associated with general anaesthesia.⁵

The added advantage of shorter hospital stay and better patient satisfaction² demands exploration of the potential scope of regional anaesthesia in head and neck surgeries.

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