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A CASE REPORT OF ANAESTHETIC MANAGEMENT OF HYPERPARATHYROIDECTOMY IN A PATIENT WITH PARATHYROID ADENOMA

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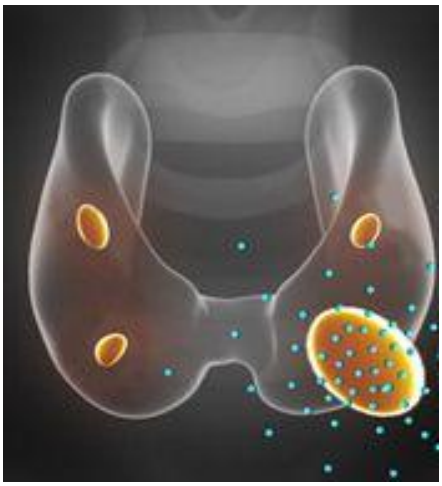
INTRODUCTION

Due to Advancements in Anesthesia and Endocrine surgical techniques, there is a steady rise in the successful surgical outcome of patients with endocrine disorders. At the same time, endocrine disorders present unique challenges such as electrolyte and metabolic disturbances which have a profound effect on the normal human physiological mechanism thereby increasing complexity in the perioperative management to the attending anaesthesiologist.

Primary Hyperparathyroidism is one such condition caused by an over production of parathyroid hormone in excess of the amount required by the body. This eventually leads to hypercalcemia. Of particular relevance to the anaesthesiologist are the effects of calcium on the myocardium, vascular smooth muscles and blood coagulation.[1] The classical findings of advanced hyperparathyroidism are encountered in developed countries. About less than half of the patients with hyperparathyroidism manifest skeletal lesions. We are presenting here classical findings of primary hyper parathyroidism caused by parathyroid adenoma in a patient and the successful anaesthetic management of parathyroidectomy. Most of the patients with parathyroid adenoma belonged to AMERICAN SOCIETY OF ANAESTHESIOLOGISTS GRADING 2 and the risk of anaesthesia was high due to possible electrolyte changes and

worsening of renal function. An uneventful course of anaesthesia in the presented case was related to thorough systemic evaluation and careful anaesthetic strategy.



PARATHYROID GLAND.

CASE REPORT

A fifty three year old female was admitted in our hospital with a history of severe pain in the right side of the hip following a trivial trauma. She had difficulty in walking and had swelling over the right hip region. Radiograph of the pelvis and lower limb revealed a pathological subtrochanteric fracture of left femur. An ultrasound examination of the abdomen revealed no abnormality. The skull radiograph shows granular appearance of the skull with multiple areas of normal bone interspaced between, giving typical “pepper pot skull” appearance with loss of distinction of inner and outer table and loss of lamina dura. Ultrasound neck of the patient revealed a large heterogeneously hyperechoiec lesion measuring 4.4*2.2*3cm. Noted on the left side near the postero-inferior surface with increased vascularity in the posterior lobe of thyroid gland. Possibility of parathyroid adenoma was suspected and fine needle aspiration cytology was advised. Fine needle aspiration cytology confirmed the diagnosis. Tiny solitary nodular goiter of right lobe of thyroid was observed. Relevant abnormal biochemical parameters were raised. Serum calcium (11.9mg/dl{normal- 9-10.5mg/dl}), raised alkaline phosphatase (717 U/L {Normal-30-120U/L}), low inorganic phosphorus(1.3mg/dl{ normal-3-4.5mg/dl}).

The patient underwent left parathyroidectomy under GA. A combination of benzodiazepine, Inj. Midazolam 1mg IV and H2 antagonist, Inj. Ranitidine 50mg IV was administered as IV premedication. Inj. Glycopyrrolate 0.2mg iv was also given 30minutes prior to induction. Cervical collar was in situ and manual in line traction of the neck done by an assistant for

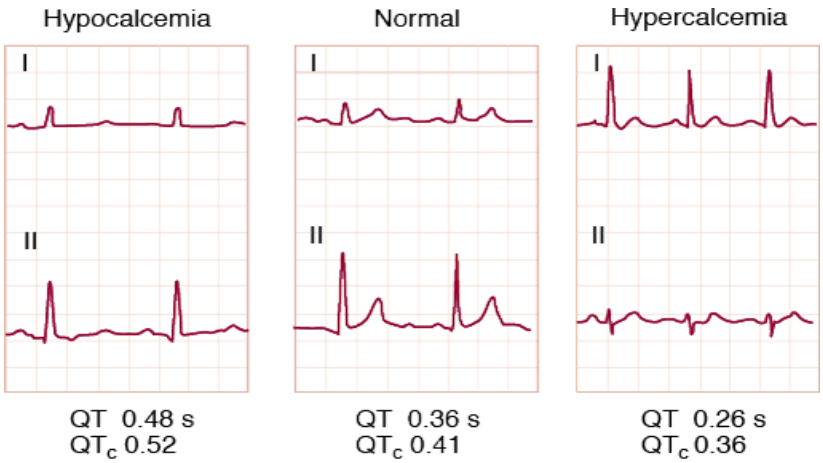
preventing any dislocation or possible fracture of the cervical vertebrae. Preoxygenation followed by i.v. induction and muscle relaxation with a depolarising neuromuscular blocking drug due to anticipated difficult airway.[2,3,4] was planned. Inj. Propofol 2mg/kg IV was administered in combination with inj. Fentanyl 2mcg /kg IV. Inj. Succinylcholine (2mg/kg) was our drug of choice for intubation facilitation. Anaesthesia was maintained with sevoflurane (1.5-3 vol%), O_2 (1.5 L/min), N2O (1.5 L/min), inj. Fentanyl 2mcg /kg IV and inj.vecuronium 0.1mg/kg IV were given to maintain analgesia &muscle relaxation.

Pathological Subtrochanteric Fracture.

A head-up position was preferred as it enables the gravitational drainage of blood and decreased vascularity of gland for the surgeon Intraoperatively, blood was arranged as the risk of haemorrhage was high due to confluence of vessels. Muscle relaxants were used in titrated manner as the associated muscle weakness warranted smaller dose of muscle relaxants. It was imperative to proceed with smooth process of extubation so as to avoid any stress response and accidental haemorrhage from the operative site. Dexmedetomidine was used in the dose of 1mcg/kg/hr IV for smooth extubation.[5] Since hypercalcemia may cause inadequate reversal, Train Of Four stimulation (TOF) was used to monitor the degree of neuromuscular blockade. Patient was reversed from residual neuromuscular blockade with Inj.neostigmine 0.05mg/kg and inj, glycopyrrolate 0.01mg/kg IV. Extubation was carried out in a fully awake state and after establishing a regular breathing pattern with adequate tidal volume and muscle strength.

Awake extubation aids in eliciting the vocal cord movements as perceived with indirect laryngoscopy. Postoperatively, serum calcium, magnesium, phosphate & parathyroid

hormone levels were measured regularly. Parathyroid hormone level was 15pg/ml **(Normal-12-88pg/ml)** postoperatively after 12hours. A decrease of serum calcium post-operatively within 24 hours was clinically manifested as **Chvostek's sign** and **Trousseau's sign**. Symptomatic hypocalcaemia was treated with **10% calcium gluconate IV** over 10minutes. Serum calcium levels were measured after 4 hours, it was 9.8mg/dl. QTc interval on ECG was a good diagnostic tool to serum calcium levels.



ECG CHANGES.

DISCUSSION

There are usually four parathyroid glands, two superior and two inferior, located behind the upper and lower poles of the Thyroid gland Parathyroid hormone (PTH) is the principle hormone regulating calcium homeostatis. Maintenance of calcium is affected by 3 calciotropic hormones: Parathyroid hormone, Vitamin D and Calcitonin.[6] PTH maintains serum calcium by stimulating bone resorption, thus releasing calcium, by enhancing gastrointestinal absorption and inhibiting renal excretion of calcium. In primary hyperparathyroidism, levels of PTH are excessive and hypercalcemia occurs as a consequence.

IMPLICATIONS ON PERIOPERATIVE CARE

CVS: Dehydration, anemia, baseline CAD or cardiac dysfunction, hypertension, calcification of myocardium.

RENAL/ GI: dehydration secondary to polyuria, anorexia, vomiting/ renal stones. Acute pancreatitis/peptic ulcer, chronic renal insufficiency.

NEUROLOGIC: intracerebral calcification may present with seizures. Lethargy, depression common in chronic state.

MEDICATIONS

Diuretics: decrease calcium and should be continued until the time of surgery.

Bisphosphonates: Increase bone density.

Cinacalcet: inhibit PTH and lower calcium.

Glucocorticoids: counter the effects of vitamin D.

Calcitonin: Natural hormone that counteracts the effects of PTH. It stimulates osteogenesis and movement of calcium into bones. It is administered IV to rapidly lower elevated calcium(>14mg/dl).

Mitramycin: lowers calcium in emergency situations by blocking osteoclastic effect of calcium. Risk of thrombocytopenia, renal/liver injury is there.

CONCLUSION

Meticulous preoperative assessment, optimization and avoidance of factors potentiating hypocalcemia and hypercalcemia are the mainstay of anesthetic management of hyperparathyroid disease. Close perioperative monitoring for the signs of hypocalcemia and hypercalcemia, restoring and maintaining normal calcium levels are the focus for successful outcome in these patients**.**

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