

## INTRAOPERATIVE HYPOCALCEMIA FOLLOWING TOTAL THYROIDECTOMY

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### Abstract

Hypocalcemia is a known complication following total thyroidectomy which usually manifests about 36 hours postoperatively. We describe the rare manifestation of hypocalcemia as refractory hypotension and its successful management following total thyroidectomy.

**Key words:** total thyroidectomy, hypocalcemia, intraoperative period.

### Introduction

Hypocalcemia is a known complication following thyroidectomy with its incidence being 1% to 2%<sup>1</sup>. It usually occurs about 36 hours postoperatively<sup>2</sup>. We present a rare case of intraoperative hypocalcemia manifested as refractory hypotension.

### Case Report

A 50 year old ASA I female, known case of thyroid malignancy, was scheduled for total thyroidectomy. Preoperative thyroid function tests were normal. Serum calcium measured was 8.8mg%. After appropriate fasting and premedication, she had a HR of 78 beats/min and blood pressure was 120/82 mmHg. Under standard monitoring (SpO<sub>2</sub>, non-invasive blood pressure, electrocardiogram, end-tidal carbon dioxide),

anaesthesia was induced with thiopentone, fentanyl and vecuronium. Trachea was intubated and mechanically ventilated. An end-tidal isoflurane concentration of 1% in a 50% mixture of air and oxygen, intravenous morphine and paracetamol were used for maintenance. All monitored parameters remained stable throughout the induction and maintenance of anaesthesia. After removal of thyroid gland leaving two parathyroids in situ, (ie, approximately 10 minutes later) her heart rate increased from 80/min to 130/min and systolic and diastolic pressure fell from 110/70 to 60/30mmHg. Crystalloid and colloid 500ml each were infused rapidly though there were no obvious signs of hypovolaemia along with boluses of phenylephrine in 50 µg aliquots (total 500µg). There was no significant response to it. Air embolism, anaphylactic / anaphylactoid reactions were ruled out. Chest auscultation was normal. Arterial blood gas, serum sodium and potassium were normal. Measured serum calcium was 5.5mg%. 10ml of Inj.calcium gluconate 10% was given intravenously over 10-20 minutes. Blood pressure improved to 100/70 mmHg and heart rate decreased from 110 to 85/min. Infusion of 10% calcium gluconate was kept available to start if there was any haemodynamic instability subsequently. Patient's trachea was extubated after adequate reversal of neuromuscular blockade and shifted to high dependency unit. She had an uneventful recovery. Serum albumin and magnesium measured were 3.8g and 2mg% respectively. Repeat serum calcium measured after 24 and 48 hours was 6.8mg% and 7.7mg % respectively. (Figure 1) In consensus with endocrinologist, patient was started on calcium supplementation and advised to review after 3 months.

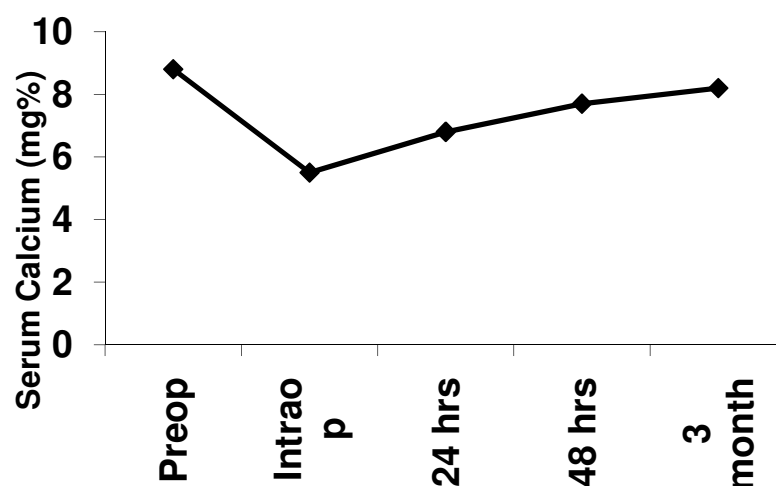


Figure 1: Measured serum calcium during perioperative period

## Discussion

Risk factors for hypocalcemia after thyroidectomy include Grave's disease, malignancy and the type of procedure performed. The threshold level for the development of the symptoms of hypocalcemia is not well defined<sup>3</sup>. Many patients develop symptoms when serum total calcium concentration is about 7 mg/dL. The cardiovascular symptoms include hypotension, impaired cardiac contractility, and prolongation of the QT interval<sup>1</sup>. In anaesthetized or critically ill and unresponsive patients, the only evidence of hypocalcemia may be hypotension due to decreased myocardial contractility<sup>4</sup>. Our patient had hypotension with electrocardiogram showing sinus tachycardia. It is important to note that the electrocardiogram may be normal inspite of life-threatening hypocalcemia and a normal ECG cannot therefore be relied upon to exclude this condition<sup>3</sup>. Air embolism, anaphylactic / anaphylactoid reactions were ruled out by clinical and laboratory measurements.

Acute symptomatic hypocalcemic patients should be treated promptly. Our patient was treated with 10% calcium gluconate infused over 10-20 minutes. It is preferred over calcium chloride because it causes less tissue necrosis if extravasated. Faster administration may result in cardiac dysfunction, even arrest<sup>5</sup>. We planned to start calcium infusion at a rate of 1-2 mg/kg/hr if symptoms do not resolve. Since patient's haemodynamics were stable following bolus, infusion of calcium was not administered. Oral calcium supplementation was started with subsequent measured calcium within normal range and patient was clinically asymptomatic then onwards.

## Conclusion

Though hypocalcemia occurs about 36 hours post operatively, it was interesting that despite the presence of remaining two parathyroid glands, our patient had hypocalcemia intraoperatively which promptly responded to intravenous calcium.

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