



## UNDETECTED HYPOTHYROIDISM COMPLICATING GENERAL ANAESTHESIA – A CASE REPORT

**Dr. Ameeta Sahni**

Professor, Department of Anaesthesiology and Intensive Care, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi

**Dr. Mahima Singh\***

Senior Resident, Department of Anaesthesiology and Intensive Care, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi.  
\*Corresponding Author

### ABSTRACT

Patients with hypothyroidism maybe encountered in anaesthetic practice. Those well controlled on medication have low anaesthetic morbidity, but undetected/uncontrolled hypothyroidism can result in severe cardiovascular and respiratory depression complicating anaesthesia.<sup>1,2</sup> Detection of hypothyroidism in patients with rare manifestations becomes difficult. We present a patient diagnosed with hypothyroidism postoperatively due to delayed recovery from anaesthesia. Retrospectively, his long-standing dysarthria was a manifestation of severe hypothyroidism.

### KEYWORDS :

#### INTRODUCTION

Patients with hypothyroidism maybe encountered in anaesthetic practice. Those well controlled on medication have low anaesthetic morbidity, but undetected/uncontrolled hypothyroidism can result in severe cardiovascular and respiratory depression complicating anaesthesia.<sup>1,2</sup> Detection of hypothyroidism in patients with rare manifestations becomes difficult. We present a patient diagnosed with hypothyroidism postoperatively due to delayed recovery from anaesthesia. Retrospectively, his long-standing dysarthria was a manifestation of severe hypothyroidism.

#### CASE REPORT

A 35-year-old man had a history of backache for 1.5 years following a sports injury. He was diagnosed to have spondylolysis of lumbar 4-5 vertebrae and planned for posterior pedicle screw fixation, laminectomy, decompression and L4-5 discectomy.

During pre-anaesthetic evaluation, no abnormality was detected except for slurred speech since childhood.

Neurological examination was normal, except for decreased motor power in the lower limbs. MRI scan reported a diffuse disc bulge at L3-4 and a central disc extrusion at L4-5 with sac indentation and obliteration of bilateral neural foramina. A non-contrast computerized tomography of the head, blood counts, and liver and kidney function tests were normal.

As we assumed dysarthria was not relevant to anaesthesia, the patient was taken up for surgery. He was premedicated with morphine 0.075 mg/kg body weight, induced with propofol 2 mg and rocuronium 0.9 mg/kg body weight, intubated and maintained on oxygen, nitrous oxide and isoflurane. The preoperative heart rate was 70/minute and blood pressure 110/70 mmHg, and the intraoperative rate was between 50 and 70/minute (mean 60/minute). Only two doses of rocuronium 10 mg each were required for the 4-hour surgery. At the end of surgery, after he had spontaneous respiratory effort, neuromuscular blockade was reversed with neostigmine 0.05 mg and glycopyrrolate 0.01 mg/kg body weight. He obeyed oral commands but had a poor respiratory effort. Supplemental doses of reversal drugs were given as we suspected inadequate reversal. The arterial blood gas, serum electrolytes, blood sugar and temperature were normal. As his respiratory effort did not improve, he was shifted to our intensive care unit (ICU) for ventilatory and supportive care. We did not reverse the analgesia as the patient was conscious and obeying commands.

In the ICU, a thyroid profile was obtained as the patient had

poor respiratory effort with inadequate reversal postoperatively, relative bradycardia, requirement of small doses of drugs intraoperatively and the presence of dysarthria preoperatively. The thyroid stimulating hormone (TSH) level was 162  $\mu$ U/ml (normal 0.5–5.2), triiodothyronine (T3) 0.14 nM/L (normal 0.9–2.79), thyroxine (T4) 12.9 nM/L (71–161). He was started on L thyroxine 250  $\mu$ g through the nasogastric tube followed by 125  $\mu$ g once daily, as injectable thyroxine and oral T3 were not available.

On direct questioning the patient confirmed the presence of dry skin, weakness in the limbs, easy fatigability and increased somnolence. His thyroid gland was not enlarged.

He was given supportive care with intravenous fluids, mechanical ventilation, maintenance of temperature (warm fluids and radiant heat) and hydrocortisone. His general condition improved. He was gradually weaned from the ventilator, extubated on postoperative day 5 and shifted to the ward on day 7.

His subsequent recovery was uneventful. His anti-thyroid peroxidase and anti-microsomal antibodies were negative and a diagnosis of primary hypothyroidism was made. At 8 weeks postoperatively his dysarthria had improved on oral L thyroxine 125  $\mu$ g once a day and his TSH level was 34 mIU/L.

#### DISCUSSION

Thyroid hormone has an effect on nearly all organ systems of the body. Hence, deficiency of this hormone can result in a variety of symptoms and signs. The typical manifestations of hypothyroidism include tiredness, feeling cold, weight gain, etc.<sup>3</sup> There are uncommon manifestations of hypothyroidism which suggest other conditions and divert attention to those causes.<sup>4</sup>

Patients in whom hypothyroidism is confirmed, hormone replacement is initiated to achieve the euthyroid state prior to surgery and anaesthesia, as untreated and uncontrolled hypothyroidism can complicate anaesthesia with increased morbidity including severe hypotension, coma and cardiac arrest.<sup>5</sup> Sensitivity to anaesthetics and narcotics is increased with prolonged period of unconsciousness, hypoventilation leading to respiratory acidosis and fall in cardiac output with bradycardia. Depression of hypoxia and hypercapnic ventilatory drive, respiratory muscle weakness and phrenic nerve neuropathy may precipitate respiratory failure.

There maybe postoperative fluid imbalance, hypothermia, adrenocortical insufficiency, decrease in metabolism of anaesthetic drugs, anaemia, hypoglycaemia,

cardiorespiratory instability with delayed reversal and recovery requiring prolonged respiratory support.<sup>1,2</sup>

These problems are not seen with treated or euthyroid patients.

Westphal reported some uncommon and atypical symptoms of hypothyroidism including mental dysfunction with a variety of psychiatric symptoms misdiagnosed as a primary psychiatric disorder, decreased gut motility with constipation leading to gut obstruction and neurological disorders like cerebellar ataxia and myopathy involving respiratory and pharyngeal muscles making weaning from a ventilator difficult.<sup>9</sup>

Isolated dysarthria is an unusual manifestation of hypothyroidism.<sup>7,8</sup> Our patient did have dysarthria but we did not suspect hypothyroidism as the symptom was reportedly since childhood.

There are few reports of dysarthria attributable to hypothyroidism.<sup>7,8</sup> The hoarse voice and clumsy speech of hypothyroidism may be due to fluid accumulation in the vocal cords and tongue.<sup>3</sup>

Dysarthria is a disturbance of articulation caused by a structural vocal cord abnormality or neuromuscular disease.<sup>8</sup> Neuromuscular causes (central or peripheral) include head trauma, brain stem infarction, bulbar palsy, motor neuron disease, multiple sclerosis, Parkinsonism, peripheral neuropathy and myasthenia.<sup>7</sup> Structural causes may be congenital, traumatic, inflammatory, neoplastic or postoperative. Storage disorders like amyloidosis, and acromegaly or hypothyroidism may lead to an abnormality of the vocal cords.<sup>7</sup>

A delayed reversal and recovery from anesthesia, decreased requirement of neuromuscular blocking agents and narcotics and relative bradycardia made us suspect hypothyroidism and his thyroid function tests were abnormal. He was extubated on day 5 of starting treatment and his dysarthria improved over the next 8 weeks.

## CONCLUSION

Unusual manifestations of hypothyroidism make the diagnosis difficult or shift the focus from the primary pathology. Awareness of unusual signs and symptoms help suspect the diagnosis and correct the abnormality, thus preventing complications under anaesthesia and also alleviate them once treatment is started.

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