



International Journal of Medical Anesthesiology

E-ISSN: 2664-3774

P-ISSN: 2664-3766

www.anesthesiologypaper.com

IJMA 2021; 4(2): 226-228

Received: 01-02-2021

Accepted: 03-03-2021

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A case of carcinoma larynx with overt hypothyroidism scheduled for feeding jejunostomy

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DOI: <https://doi.org/10.33545/26643766.2021.v4.i2d.256>

Abstract

The function of the thyroid gland is to secrete sufficient amount of thyroid hormones for regulation of cellular metabolism throughout the body. Patients need medical care for hyper functioning (hyperthyroidism) or hypo functioning (hypothyroidism) of the thyroid gland. Hypothyroidism is a very common disease affecting 0.5% to 0.8% of the adult population in the world. Primary hypothyroidism results in a decreased production of thyroid hormones despite adequate or increased levels of TSH and accounts for 95% of all cases of hypothyroidism. Secondary hypothyroidism results due to hypothalamic or pituitary disease that accounts for 5% of cases of hypothyroidism [1]. Hypothyroidism can cause decreased myocardial contractility, baroreceptor dysfunction, weight gain, non-pitting edema, hyponatremia, decreased ventilatory response to hypoxia and hypercarbia, diminished gastrointestinal function and impaired drug metabolism. Feeding jejunostomy is a surgical procedure by which a tube is inserted in the lumen of the proximal jejunum, primarily to provide enteral nutrition or administer medications. This procedure becomes a vital path for providing nutrition and medication when a person becomes unable to swallow due to obstruction of the food pipe [2]. Carcinoma larynx is a disease in which malignant cells originate from larynx mostly squamous-cell carcinomas which can invade the surrounding structures. Here, we report on the anaesthetic management of a patient of carcinoma larynx with overt hypothyroidism for feeding jejunostomy.

Keywords: carcinoma larynx, overt hypothyroidism, feeding jejunostomy

Introduction

We report a case of 40 years old female patient with carcinoma larynx tracheostomised previously under local anesthesia with chief complaints of difficulty of swallowing even with clear fluids. She was a recently diagnosed hypothyroid patient 4 months back on treatment with tablet thyroxine 100 microgram once daily. The patient was unable to take the medication since the last 7 days because of dysphagia. Therefore the patient was posted as a semi emergency case for feeding jejunostomy. The patient had received 6 cycles of chemotherapy previously.

On physical examination the patient looked thin with body weight of 52 kg and height of 160 cm and clinically the patient was unremarkable with a normal mental status, pulse rate of 86 per minute and blood pressure of 100/60 mmHg. Blood investigations showed haemoglobin 10.6gm/dl, haematocrit 32, total leucocyte count 6530, random blood glucose 94, serum creatinine 1.10, serum electrolytes within normal limits, serum albumin 3.5 gm/dl, liver function tests within normal limits, INR 1.15, TSH >100 (normal range 0.46-4.6 uIU/ml), serum T3-0.7 ng/ml (normal range - 0.97-1.69 ng/ml), T4-60 nmol/l (normal range 71.2-141.0 nmol/l), chest x-ray and electrocardiogram revealed no abnormality. Patient was tracheostomised earlier and presented with 7.5mm internal diameter tracheostomy tube. In view of non-availability of intravenous (IV) levothyronine the patient was deprived of treatment of hypothyroid which has made the operation urgent. Multiple attempts were done by surgeons for Ryle's tube insertion but were unsuccessful.

The patient party was explained about the risk involved in providing anaesthesia and informed high risk consent was taken. Monitoring included pulse oximetry, non-invasive blood pressure, electrocardiogram, temperature and urine output. The preoperative vitals were within normal limits and a wide bore intravenous cannula was introduced. Preloading of 500 ml ringer's lactate solution was done. Under all aseptic and antiseptic conditions subarachnoid block was given at the level of lumbar L3-L4 interspace using 15 mg 0.5%

heavy bupivacaine. The patient was immediately made to supine position after injecting the drug intrathecally. Adequate blockade was tested with pin prick technique and the blockade was achieved up to T₄ level. Intraoperative vitals were within normal limits throughout the course of surgery. The duration of surgery was one and half hour and the operation were uneventful. After the operation the patient was shifted to intensive care unit for observation. Analgesia was maintained with paracetamol 1 gram 8

hourly. Trail feeds were started on post-operative day 1 and thyroxine tablet 200 µgm once daily from post-operative day 2. Thyroid function test on postoperative day 3 revealed TSH 88 (normal range 0.46-4.6uIU/ml), serum T3-0.8 ng/ml (normal range - 0.97-1.69 ng/ml), T4-70 nmol/l (normal range 71.2-141.0 nmol/l). The patient was conscious, oriented and vitals were within normal limits and was shifted to ward.

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DIAGNOSTIC SERVICES - CLINICAL BIOCHEMISTRY				
Case No.	GF/02658	Requisition No.	FEC/TM/20/058389	Req. Dt. 29/10/2020
Name	[REDACTED]			Lab No: P20052355
Gender / Age	F / 40 Years	Category/Status	C/ In Patient	Ward: Surgery Female
DMG :	DMG - HEAD & NECK			
Provisional Diagnosis				
Nature of Material	BLOOD			
	FINAL	TUMOR MARKER REPORT		29/10/2020
INVESTIGATION	VALUE	UNITS	Biological Reference Interval	
Serum TSH (Thyroid Function)	>100	uIU/ml	0.465-4.68	
CMIA				

Fig 1: Serum TSH level of the patient

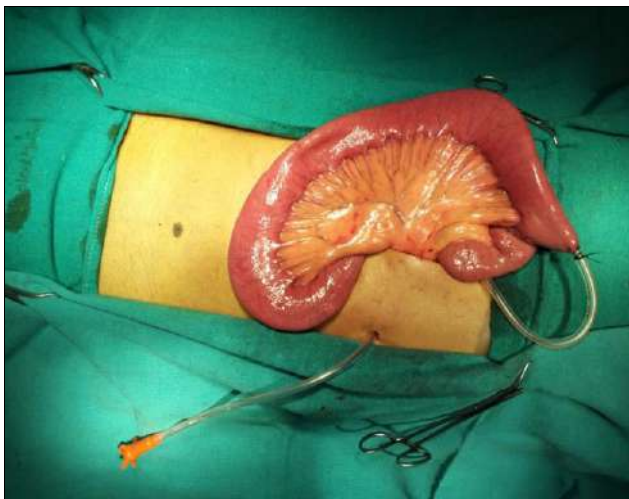


Fig 2: Jejunostomy with feeding tube

Discussion

The thyroid gland weighing approximately 20 grams composing of two lobes joined by an isthmus butterfly-shaped sits low on the front of the neck [1]. It secretes hormones that control metabolism in the body. Hypothyroid is a clinical state in which the thyroid gland doesn't produce enough thyroid hormones and commonly seen in females and can be in subclinical form or overt hypothyroidism. These thyroid hormones plays a vital role in homeostasis due to their effects on the cardiovascular, respiratory, renal, gastrointestinal, hematologic, and central nervous systems. Cardiac output is decreased and myocardial contractility becomes reduced secondary to systolic and diastolic dysfunction and the heart may become enlarged and dilated in advanced cases. Baroreceptor function is also impaired. Maximum breathing capacity and diffusion capacity are

decreased and ventilatory responsiveness to hypoxia and hypercarbia is depressed. Gastrointestinal function can be slow in hypothyroid patients which can cause a problem in post-operated patients. Even though catecholamine levels are high in these patients, hypothyroid patients have a likely to develop hypotension under anesthesia, which is due to down regulation of β -adrenergic receptors [3].

Myxedema coma is defined as severe hypothyroidism leading to altered mental status, manifested as coma or seizure, and hypothermia, bradycardia, hyponatremia, heart failure, and hypopnea. It can be precipitated by infection, surgery, cold exposure, and administration of sedatives [4]. Elective surgeries are mostly deferred when a patient is hypothyroid and thyroxine medication given orally to make the patient euthyroid. The half-life of levothyroxine is approximately 7 days so patients who are unable to take oral levothyroxine post operatively can miss it without any harm for several days [4]. And if there is a delay of more than 5 days for the patient to take levothyroxine orally, intravenous (IV) levothyroxine should be administered at a dose between 60% and 80% of the oral dose [5]. In emergency cases of hypothyroid patients like of our case intravenous levothyroxine is to be used as loading dose thereafter on daily basis. In our case we are unable to arrange intravenous levothyroxine because of its unavailability which made the surgery an emergency for the patient to start for hypothyroid medications.

On the other hand undergoing surgery is always a stressful event for the patient and in a hypothyroid patient the risk of hypotension and cardiovascular collapse increases to many fold compared to a euthyroid patient. Hypothyroid patients appear to have an increased sensitivity to anaesthetic drugs probably secondary to reduced cardiac output, decreased blood volume, abnormal baroreceptor function, decreased hepatic metabolism and decreased renal excretion [1].

Airway compromise due to swollen oral cavity may be present. Decreased gastric emptying increases the risk of regurgitation and aspiration when general anaesthesia is given. The anaesthetic drugs can decrease ventilator response to hypoxia and hypercarbia and hypothermia can rapidly occur in hypothyroid patients. Therefore regional anaesthesia is recommended if there is no contraindication and the nature of the surgery permits it.

Anand T *et al.* [6] gave epidural anaesthesia in a case of subacute intestinal obstruction for emergency laparotomy with overt hypothyroidism. Buyukarkmen and Ozturk⁷ also used spinal anaesthesia with low dose local anaesthetic (10mg heavy bupivacaine) for lower limb orthopedic surgery and the surgery was uneventful. In our case we have used 15 mg (3 ml) of 0.5% heavy bupivacaine as we required a higher blockade up to T4 segment.

Conclusion

We conclude that regional anaesthesia can be a safe method in compared to general anaesthesia in hypothyroid patients requiring immediate surgery.

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