



CERVICAL EPIDURAL BLOCK FOR EMERGENCY HAND SURGERY IN A PATIENT WITH UNTREATED SEVERE HYPOTHYROIDISM

Srinivas Mantha, MD, Nirmala Jonnavithula, MD, Rahamathullah Mohammad, MD
Dept. of Anesthesiology, Nizam's Institute of Medical Sciences, Hyderabad, India

Abstract	Introduction and Challenging Case Report	Challenging Case Report	Discussion	References
<p>Introduction: Perioperative management of a patient with untreated severe hypothyroidism is challenging. Thyroid stimulating hormone (TSH) is a sensitive indicator of hypothyroid state. Perioperative problems are related to multisystem involvement coupled with increased sensitivity and duration of anesthetic drugs.</p> <p>Challenging case report: A male patient aged 43 years presented to the emergency department with crush injury of right hand. He was a known case of hypothyroidism for the past six years on irregular treatment. Routine laboratory investigations were normal. EKG showed right bundle branch block with inverted T waves in lead II, III, and all chest leads. Two-dimensional echocardiography revealed a normal study. Thyroid profile revealed the following values: 0.35 ng/dL (range: 0.80 to 1.78) of T3, 2.82 µg/dL of T4 (range: 6.09 to 12.23) and 95.14 µIU/ml (range: 0.34 to 5.6) of TSH. Oral thyroid replacement therapy was commenced with 100 µgm of levothyroxine daily.</p> <p>Emergency surgical debridement followed by groin flap was planned. With patient in sitting position cervical epidural anesthesia (CEA) block with 18 G Tuohy needle was performed at C7-T1 level. Epidural catheter was advanced 4 cm cephalad. Patient was placed back in the supine position and 5 ml of 0.5% bupivacaine was administered in a graded manner over 10 minutes. A segmental block of C4 to T3 was achieved. Infusion of 0.375% of bupivacaine at the rate of 3 ml per hour was given to facilitate surgery that lasted for 150 minutes. As the wound was contaminated, groin flap cover surgery was deferred. The catheter was retained and patient was shifted to the recovery room. Two days later patient was posted for groin flap surgery. CEA was activated with 5 ml of 0.5% bupivacaine followed by Infusion of 0.375% of bupivacaine at the rate of 3 ml per hour. Spinal subarachnoid block was administered initially with 3 ml of 0.5% bupivacaine heavy at L3-L4 interspace. Surgery lasted for 135 minutes. Postoperative pain was managed with non-steroidal anti-inflammatory drugs on both the occasions.</p> <p>Results: Patient had an uneventful postoperative course. Oral thyroid replacement therapy was continued. Patient was discharged on the 8th postoperative day. On the day of discharge his thyroid profile was as follows: 0.49 ng/dL of T3, 4.70 µg/dL of T4 & 72.67 µIU/ml of TSH.</p> <p>Discussion: The rationale of choosing regional anesthesia technique over general is obvious. CEA is a known technique for hand surgery (1). CEA allows one to reduce the dose of local anesthetic considerably compared to other regional techniques such as brachial plexus block.</p> <p>References: 1. Michalek, P et al. Anesth Analg 2004;99:1833-6.</p>	<p>Introduction: Anesthetic management of patients with untreated severe hypothyroidism poses a real challenge particularly in emergency situations. Such patients are predisposed to multiple problems when administered general anesthesia. Multisystem involvement, poor metabolism, prolonged sedation with standard doses of anesthetics, increased sensitivity to drugs and cardiovascular instability are the essential reasons [1].</p> <p>Challenging case report: A male patient aged 43 years presented to emergency department with crush injury of right hand. He was a known case of hypothyroidism for the past 6 years on irregular treatment. Clinical findings were unremarkable except for puffy skin over face and extremities. Routine investigations were normal. EKG showed right bundle branch block with inverted T waves in lead II, III and all chest leads. Two-dimensional echocardiography revealed normal study. Thyroid profile (by automated chemiluminescence immunoassay: CLIA method) revealed the following values: • T3: 0.35 ng/dL (normal range 0.8 to 1.78) • T4: 2.82 µg/dL (normal range 6.09 to 12.23) • TSH 95.14 µIU/ml (normal range 0.34 to 5.6)</p> <p>Oral thyroid replacement therapy was commenced with 100 µgm daily. Emergency surgical debridement followed by groin flap was planned.</p> <p>Cervical epidural anesthesia (CEA) was administered with patient in sitting position and with 18G Tuohy needle at C7-T1 level. Epidural catheter was advanced 4 cm cephalad (Figure 1)</p> <p>Figure 1</p> 	<p>Patient was placed in the supine position and 5 ml of 0.5% bupivacaine was administered in a graded manner over 10 minutes. A segmental block of C4 to T3 was achieved. Monitoring consisted of EKG, invasive blood pressure, pulse oximetry, temperature, and central venous pressure. (Figure 2)</p> <p>Figure 2</p> 	<p>Discussion: Perioperative problems associated with untreated hypothyroid patients essentially include sensitivity to anesthetic drugs, slow metabolism of drugs, prolongation of recovery time, and cardiovascular instability.</p> <p>Hypothyroidism is characterized by decreased T3, T4 and increased levels of thyroid stimulating hormone (TSH). TSH is a sensitive indicator of hypothyroid state. Emergency treatment with severe hypothyroid patient with intravenous levothyroxine is associated with increased risk of precipitating myocardial ischemia. CEA is a known technique for hand surgery [2].</p> <p>CEA allows one to reduce the dose of local anesthetic considerably compared to other regional techniques such as brachial plexus block. Regional techniques involving peripheral nerves are also technically difficult in untreated severe hypothyroid patients because of poor response to peripheral nerve stimulation [3-5].</p> <p>Polyneuropathy is more commonly associated with hypothyroid state. A unique case of completely absent response to peripheral nerve stimulation in normothermic severely hypothyroid patient was reported [5].</p> <p>The response returned to normal after 8 weeks when the patient was euthyroid followed thyroid hormone replacement therapy [5]. It is known that nerve conduction abnormalities in hypothyroid patients revert back to normal with hormone replacement therapy over a period of 3 months [6].</p> <p>Despite ultrasound guidance, there is a potential risk of plexopathy following brachial plexus block in a patient with pre-existing neuropathy [7].</p> <p>The rationale of choosing CEA over brachial plexus block is obvious. Subsequently for the groin flap surgery, we preferred spinal subarachnoid block over epidural block to reduce the dose of local anesthetic.</p> <p>In summary, awareness of anesthetic implications of severe untreated hypothyroidism is important in the perioperative management of such cases. In the present case, general anesthesia was not an obvious choice. Among regional techniques we preferred CEA over brachial plexus block to reduce the dose the local anesthetic.</p> <p>Similarly, in the second surgery, we preferred spinal subarachnoid block over epidural block for the same reason. Brachial plexus block, whether guided by nerve stimulation or ultrasound can be problematic.</p> <p>There is likely to be poor response to peripheral nerve stimulation. Even when guided by ultrasound, the actual injecting needle may result in plexopathy because of potential existence of peripheral neuropathy.</p>	<ol style="list-style-type: none">1. Kim JM, Hackman L. 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