INTRAOPERATIVE BRONCHOSPASM UNDER SPINAL ANALGESIA

- A Case Report -

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Abstract

The involvement of respiratory system occurs mainly as a result of a high spinal block. Our case describes the unusual effect of mid-spinal analgesia.

We encountered bronchospasm in an otherwise healthy patient undergoing inguinal hernia repair under subarachnoid block. The highest level of block was T6. The anxiety of the patient further aggravated the symptoms.

This is probably the first reported incident of bronchospasm as a result of spinal anesthesia. We speculate the role of unblocked parasympathetic system in the causation of this respiratory complication.

Keywords: Spinal anesthesia; complications; bronchospasm.

Introduction

Some of the well-known complications of spinal anesthesia include neurologic changes, headache after dural puncture, backache and trauma. Unexpected cardiac arrests[1] and hearing loss[2] are rare complications reported. Aseptic meningitis[3] and paralysis of the 6th cranial nerve[4] have

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also been mentioned in literature. We encountered bronchospasm in a patient undergoing inguinal hernia repair under spinal anesthesia. The involvement of respiratory system occurs mainly as a result of a high spinal block. Ours is probably the first reported complications of its type as a thorough search in English literature failed to reveal similar results.

Case Report

A 53-year old male, weighing 48 kg was admitted to surgical ward for a recurrent right inguinal hernia repair. He was a non-smoker with a healthy lifestyle. He was operated upon 6 months previously for the same, under spinal anesthesia. The previous surgery had been uneventful. All his present routine investigations were within normal limits. His pre-anesthetic check up was unremarkable for any medical history and drug or food allergy.

Following a standard fasting protocol the patient was posted for elective right inguinal hernioplasty. Inside the operation theatre, intravenous access was achieved using 18 G cannula on the dorsum of left hand. Routine monitoring of ECG, heart rate, non-invasive blood pressure and pulse oximetry was started.

Under all aseptic precautions a sub-arachnoid block was achieved at the level of L3-4 using 22 G spinal needle and 3 ml of 0.5% Bupivacaine (heavy). The procedure was performed in sitting position. The patient was made supine and once the drug was fixed, the surgical procedure was allowed to start. The level of block achieved was noted to be T6. As a protocol of our Hospital, a ventimask was placed on the patient immediately after the spinal block, with 2 litres flow of 100% oxygen.

Thirty minutes after initiation of surgery, the patient complained of difficulty in breathing. He was able to cough and speak. The level of block was again checked and was found to be T6. The surgeons during this time had been resecting the sac and clearing it off the bowel. Previous surgery had possibly made it adherent to the sac. The patient never complained of any pain during intestinal manipulations although the respiratory discomfort continued. At this juncture an obvious wheezing

could also be heard. On auscultation, the patient had rhonchi bilaterally, all over the chest. There was a drop in the oxygen saturation from 99% to 91%. A relative bradycardia was also noted. The heart rate dropped from 88 to 63 beats per minute. However, the change in blood pressure was not significant. The patient had now became anxious and once again confirmed a negative history for asthma, recent respiratory tract infection, or any allergies, and smoking. Immediately injection Deriphylline was given intravenously followed by 200 mg of hydrocortisone. There was only a slight improvement in the condition. To allay the anxiety of the patient, 3 mg of midazolam was given which gradually put the patient to sleep. Fifteen minutes later there was a complete disappearance of wheezing sound and the chest was clear on auscultation. The oxygen saturation improved to 97%. The whole even lasted 45 minutes approximately. Rest of the surgical course was uneventful. The patient was transported to the recovery room and later to the ward, moving both lower limbs and with a normal respiratory rhythm.

Discussion

During spinal analgesia, breathing becomes quiet and tranquil. This is due not only to motor blockade but also to deafferentiation with reduction of sensory input to the respiratory center. Lowered arterial and venous tone also lessens the work of heart and tends to relieve any pre-existing pulmonary congestion[4]. Therefore, occurrence of bronchospasm under spinal anesthesia is a remote possibility.

The patient was being operated for a recurrent right inguinal hernia. The earlier surgery had formed adhesions between the bowel and the hernia sac. He started having bronchospasm at the time the surgeons were handling the loops of intestine. It is believed that the unblocked parasympathetic system in spinal block may have triggered the event. Because certain bowel afferents travel in the vagus, handling the viscera may cause considerable discomfort, nausea and hiccup in the conscious patient. The occurrence of bronchospasm in this patient raises the possibility of this respiratory complication due to bowel manipulations.

Intraoperative bronchospasm may be caused by drug induced histamine release (thiopental, curare, succinylcholine, morphine), light anesthesia, parasympathomimetic stimulation (presence of endotracheal tube, surgical stimulation), aspiration, anaphylaxis or drugs with β-blocking activity[5]. The walls of the bronchi and bronchioles are innervated by the autonomic nervous system. There are abundant muscarinic receptor and cholinergic discharge causes bronchoconstriction[6].

The leucotrienes LTC4, LTD4 and LTE4 are potent bronchoconstrictors, particularly when administered by inhalation. The leucotrienes are mediators of allergic responses and inflammation. Their release is provoked when specific allergens combine with IgE antibodies on the surface of mast cells[7]. Some of the nerves in the lungs contain substance P, and substance P produces bronchoconstriction and mucus secretion. Substance P is found in endocrine cells in the gastrointestinal tract, but has not been proved to enter the circulation[8]. Hence, the role of leucotrienes and substance P in the causation of bronchospasm is unlikely in our case. We speculate that the parasympathetic stimulation due to bowel manipulation is the cause of bronchospasm. It is also likely that anxiety in the patient, after bronchospasm, aggravated the symptoms. The symptoms improved soon after the surgical manipulations were over. The drugs Deriphylline (theophylline and etophylline), hydrocortisone and midazolam helped improve the symptoms to normalcy.

To conclude, we present a case of intraoperative bronchospasm that occurred possibly as complication of spinal anesthesia. The patient was a healthy male, a non-smoker and without any history of asthma or allergies. This is probably the first reported incident of its type. We suggest that the possibility of ‘bronchospasm’ should also be included in the respiratory complications after spinal anesthesia.

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