Respiratory difficulty after parathyroidectomy due to laryngospasm

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Abstract

A 38-year-old woman was diagnosed as having hyperparathyroidism. Surgery to remove 3.5 parathyroid glands was scheduled along with intraoperative neuromonitoring of the recurrent laryngeal/superior laryngeal nerves. Even though the neuromonitoring during the surgery indicated intact recurrent laryngeal nerves, on removal of the endotracheal tube, the anesthesiologist found the patient could not be ventilated without unusual effort using the reservoir bag and tight pressure on the oxygen mask. Surgeons performing throat surgery should be aware that laryngospasm is another possible occurrence for midline paralysis of the vocalis after surgery involving the recurrent laryngeal nerves, and that iatrogenic damage to the recurrent/superior laryngeal nerves is not the only cause of respiratory difficulty after neck surgery.

Keywords

Parathyroidectomy; respiratory difficulty; recurrent laryngeal nerve; laryngospasm.

Case report

A 38-year-old African American woman was diagnosed as having hyperparathyroidism. Surgery to remove 3.5 parathyroid glands was scheduled along with intraoperative neuromonitoring of the recurrent laryngeal/superior laryngeal nerves to alleviate the hyperparathyroid activity. Structures were explored with stimulation using 0.7 mA of current for 0.2 ms duration, but a compound muscle action potential (CMAP) was not produced and the surgeon could not visualize the recurrent laryngeal nerves because that area of the neck was avoided during surgery. No train activity was apparent at closing. Enough spontaneous electromyography (EMG) was apparent to satisfy the neurophysiologist that both nerves were intact.

Since both recurrent laryngeal nerves were not visualized during the surgery and a CMAP was not obtained, a GlideScope visualization of the vocal cords by the anesthesiologist was requested by the surgeon. Both vocalis muscles appeared to move around the endotracheal
tube. On removal of the endotracheal tube, the anesthesiologist found the patient could not be ventilated without unusual effort using the reservoir bag and tight pressure on the oxygen mask. There were copious amounts of mucous secretions, which were suctioned. Again the GlideScope was used to visualize the vocal cords after removal of the endotracheal tube, which were found to be at the midline. An immediate reintubation was performed. The patient was sent to recovery intubated. An evaluation by an otorhinolaryngologist was requested. At the time of evaluation, the vocal cords were actively moving. The endotracheal tube was removed and the patient was able to breath on her own. Her voice evaluation was normal and the patient was alert.

**Diagnosis**

Respiratory difficulty due to laryngospasm.

**Clinical evidence and unusual features**

In this case, damage to the recurrent laryngeal nerves, a known complication in thyroid gland, parathyroid gland, and neck dissection was not the cause of adduction of the vocalis muscles. The ongoing EMG activity during closure of the incision bode well for vocal cord activity. This laryngeal event likely took place between closing the incision and extubation. An abundance of mucous secretions likely caused laryngospasms resulting in respiratory difficulty.

**Discussion**

In a paper on Respiratory Obstruction in Thyroid Surgery, J.S. Hiarly Wade states\(^1\)

Attempted intubation may cause laryngeal spasm if the cords have not been paralyzed by a muscle relaxant. Even the use of a laryngoscope without any attempt to pass the endotracheal tube may be sufficient to do this.

Papers by Williams and Brown\(^2\), Srivastava and Ravindran\(^3\) and Chakrabarty\(^4\) describe laryngospasm due to hypoparathyroidism in adults, but do not mention hyperthyroidism.

In this case the breathing difficulty was likely due to laryngospasm secondary to a copious amount of secretions thus causing the laryngeal muscles to contract in an effort to prevent secretions from entering the lungs. The absence of muscle relaxants was required for neuromonitoring. A more common complication of recurrent laryngeal nerve damage during parathyroid surgery was not an iatrogenic cause in this case.

Steurer et al.\(^5\) recommended identifying the recurrent laryngeal nerve and confirming its integrity with videoendoscopy to help prevent false-positive or false-negative diagnoses in all cases without a normal voice. They cite vocal cord hematoma, postoperative laryngitis and psychogenic dysphonia as other possible causes of hoarseness unrelated to nerve damage. They also found that identifying the nerves decreased nerve injury and did not add extra iatrogenic damage. We do try to identify the nerve during surgery by producing a compound muscle action potential through stimulation, but in this case the nerves were elusive. Ongoing EMG did indicate that both nerves were intact and the GlideScope was used to visualize the vocalis\(^5\).

Laryngospasm is an uncontrolled and involuntary muscular contraction of the vocal cords. It may be triggered when the vocal cords or the area of the trachea below the cords detects the entry of water, mucus, blood, or other invasive substances. It may be characterized by stridor. Some people have frequent laryngospasms awake or asleep. Reflux/gastro-oesophageal reflux disease may also cause laryngospasm and may be a perioperative and postoperative occurrence. Removal of the endotracheal tube after general anesthesia has been reported to cause laryngospasm\(^1\).

**Teaching points**

Surgeons performing throat surgery should be aware that laryngospasm is another possible occurrence for midline paralysis of the vocalis after surgery involving the recurrent laryngeal
nerves, and that iatrogenic damage to the recurrent/superior laryngeal nerves is not the only cause of respiratory difficult after neck surgery.

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References