



Bilateral Vocal Cord Palsy following short term Ventilation: A Case Report

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Abstract: A 55yr old hypertensive female patient with diagnosis of left sided diaphragmatic eventration was admitted for laparoscopic repair. The surgery was uneventful and postoperatively she was put on elective ventilation for next 18hrs. The patient complained of phonation difficulty and cough with expectoration following extubation. ENT surgeon's opinion was taken, and patient was found to have bilateral adductor cord palsy on direct laryngoscopy. Patient was kept on steroids and was discharged from the hospital on 5th post operative day. On follow up after one month, not much improvement was found in her voice quality. Possible mechanism for bilateral paralysis may be pressure of endotracheal tube cuff over the vocal cords.

Key Words: laparoscopic surgery, hoarseness of voice, bilateral vocal cord palsy, short term ventilation, endotracheal intubation.

Case Report: A 55 year old female patient was admitted for laparoscopic repair of left sided diaphragmatic eventration. She was a known case of hypertension and was on beta blockers. She had complains about gastro oesophageal reflux. There were no other co morbidities. The patient was taken up for surgery with ASA Grade II under general anaesthesia.

Induction, maintenance and recovery from anaesthesia were uneventful. Intubation was done with 7.5 mm portex endotracheal tube during the procedure and cuff was inflated till there was no leak. Post operatively, patient was shifted to surgical ICU and connected to ventilator for elective ventilation to avoid respiratory insufficiency in view of diaphragmatic repair.

18 hrs after elective ventilation the patient was disconnected from the ventilator and was extubated. Post extubation, patient developed hoarseness of voice and difficulty in phonation. She also had cough with blood stained sputum. So she was referred to ENT surgeon. He performed video assisted direct laryngoscopy which revealed bilateral adductor cord palsy. The patient was put on steroids and anti histaminic agents considering laryngeal and vocal cord oedema because of



prolonged intubation and was discharged from the hospital on 5th post operative day with proper counselling and an advice for speech physiotherapy.

Discussion: Minor trauma to the vocal cords, resulting in temporary hoarseness, is a relatively common complication of endotracheal intubation. Vocal cord paralysis is a known complication under general anaesthesia. Fortunately it is rare (much less than 1%). Damage to the vocal cords may be temporary or permanent, which may lead to unanticipated problems during recovery from anaesthesia and beyond. Most complications of intubation are likely to occur with prolonged intubation as in the case of critically ill patients in intensive care units. In addition if there is significant abductor paralysis, it may necessitate tracheotomy which is associated with morbidity and is inconvenient for the patient. If not noticed and treated in time, it may result in life threatening complications due to airway obstruction.

This case represents bilateral vocal cord paralysis in a patient who underwent laparoscopic diaphragmatic hernia repair under general anaesthesia. To date, many reports have been published about unilateral or bilateral vocal cord paralysis after general anaesthesia^{1,2} but bilateral vocal cord paralysis in patients who have undergone general surgery other than neck surgery is quiet uncommon. Vocal cord paralysis can occur due multiple reasons. Possible causes for the paralysis are recurrent laryngeal nerve injury during the operation, laryngeal nerve injury occurring during intubation, damage to the vocal cords because of endotracheal tube size etc. Causes of vocal cord paralysis as an acute complication of intubation could also be: Excessive cuff pressure that compresses the RLN as it enters the larynx, hyperextension of the neck that stretches the vagus nerve, Arytenoid dislocation and Injury to the recurrent laryngeal nerve due to anterior displacement of thyroid cartilage relative to the cricoid cartilage.

Ellis and Pallister³ proposed that compression injury by an overinflated cuff within the larynx could be inflicted on the anterior branch of the recurrent laryngeal nerve passing the medial side of the thyroid lamina. One more possible cause of the complication is damage to the left recurrent laryngeal nerve which can occur during insertion of the naso gastric tube through the oesophagus. Gastro-oesophageal reflux disease causing 'acid laryngitis' can create conditions favouring this type of complication⁴. There have been several reports, associated with transient bilateral vocal cord paralysis with laryngeal mask airway.^{5,6} Hoarseness after cardiac surgery is common. Most hoarseness is transient and its severity is predicted by duration of intubation. Positioning for sternotomy displaces the ETT cuff away from the carina. This may cause persistent hoarseness because displaced cuff from trachea to larynx may damage the recurrent laryngeal nerve or vocal cords⁷. We predict this possibility in our patient as displacement chances are much more in patients who are on ventilator because of heavy tubings.

It is known that the usual recovery time of vocal cord paralysis is three months but can vary between six weeks to one year. Only the patients with severe bilateral vocal fold (cord) immobility (BVFI) require surgical intervention. Patients with medical conditions rarely require surgical intervention because treatment of the underlying condition often improves airway compromise. For patients with bilateral vocal fold paralysis (BVFP) due to iatrogenic injury in which the recurrent



laryngeal nerve (RLN) or vagus nerve is injured (neurapraxia) but not severed, permanent surgical treatment should be postponed for at least 9 months after injury to allow spontaneous recovery. Laryngeal electromyographic (EMG) monitoring can be helpful in obtaining an index of potential recovery. Obtaining a baseline EMG 30-40 days after injury and second EMG 1 month later can help in evaluating the recovery status of the vocal cords (Munin)⁸. On the basis of the surgeon's clinical judgment, tracheostomy for patients with quickly deteriorating airways should be initiated quickly.

In evaluating a patient with bilateral vocal fold immobility (BVFI), EMG provides the potentially useful information in the following:

- Differentiating between fixation and paralysis
- Differentiating between neurapraxia and axonal transection
- Determining the presence of neuromuscular disorders or peripheral neuropathy

In adults, any definitive procedure to address vocal cord paralysis, whether unilateral or bilateral, must not be undertaken while a possibility for recovery exists. Recovery can occur as long as 12 months after injury. Every attempt must be made to determine if function is likely to return. This determination should include video direct laryngoscopy, during which the vocal fold can be palpated to assess mobility and bronchoscopy. In addition, laryngeal EMG can be used to evaluate normal action potentials (normal nerve), the absence of potentials (nonfunctioning nerve), defibrillating potentials (worsening nerve), or polyphasic potentials (regenerating nerve). The 12-month wait for return of function can be shortened by obtaining 2 laryngeal EMGs several months apart and by looking for evidence of improved function or stabilized function.⁸

The risk of vocal cord paralysis was increased three-fold in patients aged 50 or above, two-fold in patients intubated 3–6 h, 15-fold in patients intubated 6 h or more, and two-fold in patients with a history of diabetes mellitus or hypertension.⁹ These results are useful for informed consent, patient counselling, and intubation decision-making.

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