Mediastinal traction injury to the recurrent laryngeal nerve: An unusual cause for a hoarse voice

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Summary

Background: Chest wall trauma is a frequent cause for emergency department presentations, with traumatic pneumothoraces a relatively common occurrence. Vocal cord paralysis however, is uncommon.

Case Report: A 44 year old man presented with a traumatic pneumothorax following a fall. A weak and hoarse voice was noted and vocal cord palsy demonstrated on indirect laryngoscopy. CT chest was unremarkable for mediastinal lesions.

Conclusions: Clinicians need be mindful of traction injuries to mediastinal structures when examining those with chest wall injuries.

key words: laryngeal nerve • dysphonia • mediastinum

Full-text PDF: http://www.amjcaserep.com/fulltxt.php?ICID=882595

Word count: 627

Tables: –

Figures: 1

References: 5

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BACKGROUND

Chest wall injury is a common occurrence, with force enough to fracture ribs accounting for up to 39% of thoracic trauma admissions to major centres [1,2].

Traumatic pneumothoraces are fairly common occurrences, with trauma to the chest wall causing rib fractures and presumed lung trauma. On the other hand, vocal cord paralysis is a rare event, with iatrogenic injury to the recurrent laryngeal nerve by far the most common cause. We describe a case of traction injury to the left recurrent laryngeal nerve following a fall.

CASE REPORT

A 44 year old man presented via the emergency department with a fractured 4th rib and traumatic pneumothorax, having slipped and fallen onto his left chest onto a table whilst changing a light bulb. This was confirmed by erect chest radiograph which showed a moderate left pneumothorax and normal mediastinal contour. This was managed with a 24 Fr intercostal catheter in the 6th intercostal space in the mid-axillary line. An underwater seal was used and placed on suction at 20 cm of water. Post-insertion chest radiograph showed good position and resolution of the pneumothorax.

The thoracostomy tube was clamped on day 2 and removed after 4 hours when there was no evidence of pneumothorax on chest radiograph. The patient was discharged home on oral analgesia on day 3.

During his stay, he was found to complain of a weak and slightly hoarse voice. On further questioning this had been evident only since his fall. ENT review demonstrated evidence of left vocal cord palsy on indirect laryngoscopy.

CT scan of his neck and thorax performed demonstrated adduction of the left vocal cord but otherwise did not reveal any neck or mediastinal lesion that would account for recurrent laryngeal nerve palsy.

At subsequent reviews, his hoarse voice showed gradual improvement and at 6 months, he demonstrated complete clinical resolution of his symptoms.

DISCUSSION

The recurrent laryngeal nerve (syn. Inferior laryngeal nerve) is a branch of the vagus nerve (tenth cranial nerve) and is responsible for supplying all the laryngeal muscles except for cricothyroid. In this capacity, it supplies motor function to the vocal cords and hence allows the ability to phonate. Unilateral injury causes vocal cord palsy and hence a hoarse voice, while bilateral injury causes aphonia and respiratory distress.

The most common causes for recurrent laryngeal nerve injury include iatrogenic (thyroid, carotid and cervical spine surgery), neck trauma and tumor infiltrate. Rarer causes include Ortner’s Syndrome [3] and surgery to the ductus arteriosus. There have also been case reports of injury following carotid artery stenting [4] and subclavian line insertion [5].

Anatomically, the left vagus nerve arrives in the mediastinum via the thoracic inlet before giving off its recurrent laryngeal branch at the arch of the aorta. This loops around the ligamentum arteriosum before ascending beside the arch of the aorta into the neck to supply the laryngeal muscles. The aortic arch is held in the mediastinum merely by its branches and enveloped in parietal pleura on both sides. It can thus be a relatively mobile structure.

It is this mobility that has presumably allowed movement of the arch during this patient’s fall, causing traction onto the recurrent laryngeal nerve as it looped around the ligamentum arteriosum. This would thus stretch the nerve, causing a left recurrent laryngeal nerve palsy and hence dysphonia as described in this patient.

CONCLUSIONS

Traumatic chest wall injuries including fractured ribs and pneumothorax are common occurrences, especially in the elderly population. Recurrent laryngeal nerve palsy is an unusual complication of chest wall trauma, and to our knowledge previously not been described in the literature. Due to the mobility of the aortic arch and great vessels, the clinician must be mindful of possible traction injuries to mediastinal structures when assessing patients with chest wall injuries.

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