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Case Study: Unilateral Vocal Cord Paralysis

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Unilateral Vocal Cord Paralysis

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Case Presentation

Patient is an 89 year old Caucasian female with a PMH of lung cancer in remission, COPD, abdominal aortic aneurysm, thyroid nodule, bladder cancer in remission after direct chemotherapy, HTN, hypothyroidism who presents to the Emergency Department with a complaint of shortness of breath and loss of voice. Her symptoms started on Thursday and had been worsening persistent since they started. She was seen at an urgent care earlier in the day for evaluation of her symptoms. She was sent to the ED for further evaluation. She states her shortness of breath is worse when she is speaking. She also experiences shortness of breath worse when she is speaking as well. She denies fever, chills, chest pain, cough, recent URI symptoms, abdominal pain, nausea, vomiting, dysuria, lower extremity swelling.

Vital signs upon arrival to the emergency department were BP 132/75, HR 74, RR 20, SpO2 97%, Temp 97.9. On physical exam the patient was resting comfortably in bed in no distress. Her physical exam including HEENT, cardiovascular, pulmonary, abdominal, musculoskeletal, neurologic, and skin, were unremarkable with the exception of a very sounding voice when speaking.

Work Up

138	107	21	114	11.8	14.4	290	Troponin x2 <40
3.4	21	1.74			42.8		BNP 87

PT 13.1 INR .097 PTT 29

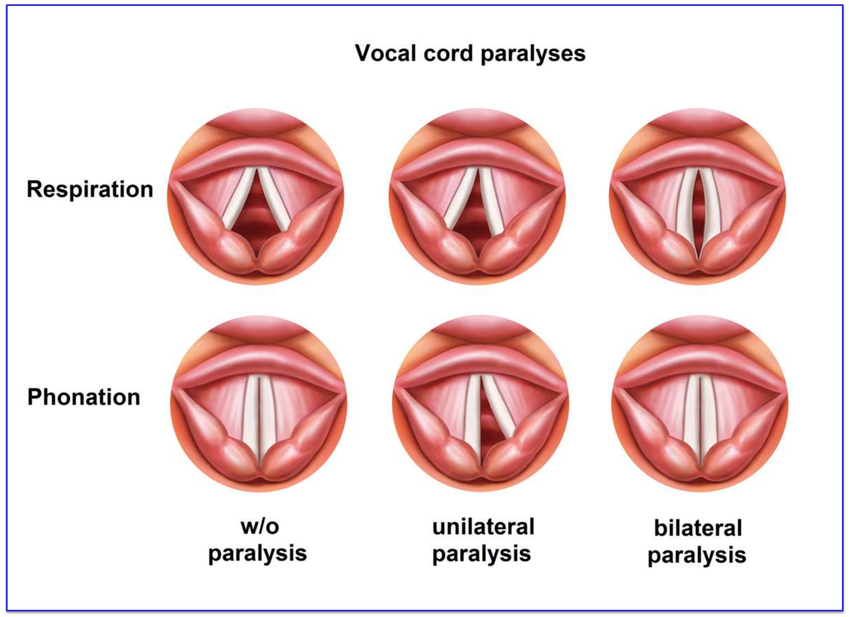
EKG: atrial-sensed, ventricular-paced rhythm
Chest x-ray showed no areas of acute disease.

CT soft tissue neck without contrast was also obtained showing no soft tissue masses. CT chest without contrast reveals a soft tissue focal mass involving the left middle upper lobe/superior left mediastinum measuring approximately 4.5 X2.4 Axis IV 0.5 cm. Findings are read as suspicious for recurrent neoplasm. Incompletely visualized abdominal aortic aneurysm that measures at least 3.8 cm from 3.1 cm previously.

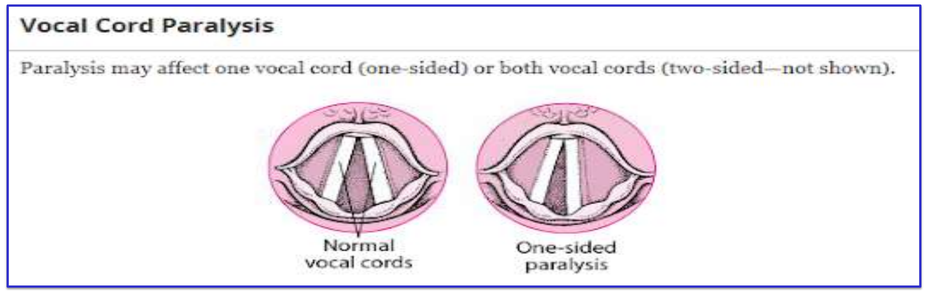
Work Up continued: Oropharynx was anesthetized with Cetacaine spray. Fiber-optic laryngoscope was advanced orally. Upon view of the vocal cords, there was evidence of paralysis to the left vocal cord confirmed with phonation.

Disposition
She was found to have unilateral vocal cord paralysis likely related to her mediastinal mass. She was provided with ENT follow-up for further evaluation of her symptoms. She was also instructed to follow-up with her primary care for further imaging studies regarding the mediastinal mass, abdominal aortic aneurysm and thyroid nodule. The patient was contacted for routine follow-up but did not return phone call.

Discussion



https://upload.wikimedia.org/wikipedia/commons/thumb/4/4e/Vocalcordparalyses.png/1200px-Vocalcordparalyses.png



https://www.merckmanuals.com/home/ear,-nose,-and-throat-disorders/mouth-and-throat-disorders/vocal-cord-paralysis

Vocal cord paralysis
Pathophysiology
Vocal cords are innervated by the recurrent laryngeal nerve. When this nerve becomes damaged, it causes paralysis of the vocal cord. Symptoms of this paralysis include hoarseness, dysphonia, dyspnea, and aspiration. Mechanical fixation can also be a cause. Either of these causes can be related to malignancy related to the thyroid, lung, esophagus, and/or mediastinum invading the vagus nerve or recurrent laryngeal nerve. Involvement of the left vocal cord is 1.4-2.5 times more common than the right. The left laryngeal nerve is more vulnerable than the right because it travels a longer distance in the thoracic cavity through the mediastinal lymph nodes, and around the aortic arch.1

Chen et al. found malignancy in males as the most common cause; while, the most common cause for vocal cord paralysis in females was surgery. According to Toutounchi et al., tumors in paramedian position were the most frequent etiological factor for vocal fold paralysis in men; while, idiopathic cases constitute 50% of cases in women in midline position.1

Discussion continued

Pathophysiology continued
Other factors may also cause vocal cord paralysis, including chronic exposure to heavy metals (arsenic, lead, and mercury), use of the drugs phenytoin and vincristine, history of a connective tissue disorder (such as Marfan syndrome), Lyme disease, sarcoidosis, diabetes, and alcoholism.2

Work up
Full history and physical including evaluation of the head, neck, larynx, and neurological examination. Chest X-ray and CT scan or MRI of the skull base to the thoracic inlet should be performed to rule out brainstem, neck, chest, and mediastinal causes.1

Research Studies
One study by Toutounchi et al. evaluated the vocal cords with laryngoscopy with a 90 degree telescope as well as full endoscopic examination of the larynx, pharynx, esophagus, thyroid, neck, lung, mediastinum, brain and heart via CT scan, MRI, barium swallow and thyroid scan. Their study showed bilateral paralysis was 6.82%, left paralysis 56.82% and right 36.36% that was consistent with Ko et al. reporting nearly 68% paralysis in left side and Srirompotong et al. reporting 73% of the paralysis in left side. The study by Ko et al. showed the most common tumor sites were thyroid and lung tumors, and studies by Chen et al. reported lung cancer was the etiology for paralysis in their 34 case review. The study by Toutounchi et al. showed the most common tumors were in the larynx, thyroid and lung respectively. In Chen et al. and Ko et al.found that thyroidectomy was the most common surgical reason for vocal cord paralysis. The most popular causes, according to Toutounchi et al., for paralysis following surgery were heart and then thyroid surgeries, respectively.

Conclusion

When evaluating a patient with dysphonia, include in your differential diagnosis vocal cord paralysis. Take thorough history and physical exam. Also consider the causes of vocal cord paralysis when completing your workup. Remember to ask about personal history of cancer or recent surgery when evaluating patient with dysphonia. . If Otolaryngology is not readily available, consider direct visualization of the larynx with fiber-optic laryngoscopy. The potential causes of and complications of vocal cord paralysis can life threatening; be sure to provide these patients with Otolaryngology follow up.

References

1. Seyed Toutounchi, S. J., Eydi, M., Golzari, S. E., Ghaffari, M. R., & Parvizian, N. (2014). Vocal cord paralysis and its etiologies: a prospective study. *Journal of cardiovascular and thoracic research*, *6*(1), 47-50. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3992732/
2. Clarence T Sasaki. (2018). Vocal cord paralysis. *Merck Manuel Consumer Version.* https://www.merckmanuals.com/home/ear,-nose,-and-throat-disorders/mouth-and-throat-disorders/vocal-cord-paralysis