Sarcoidosis Presenting as Bilateral Vocal Fold Paralysis

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Summary: Sarcoidosis with cranial polyneuritis and mediastinal granulomatous compression as a cause of unilateral left vocal fold paralysis has been reported infrequently. No case of sarcoidosis causing bilateral vocal fold paralysis in the abducted position has been reported in the Otolaryngology/Voice literature. Vocal fold function can be impacted in sarcoidosis by direct laryngeal involvement or by neural pathways. In the patient described in this case, sarcoid cranial polyneuritis coupled with bilateral paratracheal and mediastinal adenopathy resulted in bilateral vocal fold paralysis. This patient had a dramatic response to treatment with steroids. Sarcoidosis should be included in the differential diagnosis of unilateral or bilateral vocal fold paralysis.

Key Words: Bilateral vocal fold paralysis—Sarcoidosis.

INTRODUCTION

Neoplasms (lung, lymphoma, larynx, thyroid, esophagus, carotid body, nasopharynx, glomus) represent the most common proven cause of sudden-onset adult unilateral vocal fold paralysis, with bronchogenic carcinoma being the leading cause. Trauma (neck surgery, blunt injury, gunshot wound, intubation), central nervous system disease (Arnold-Chiari syndrome, tumor, degenerative or vascular disease), cardiac disease (aortic aneurysm, cardiomegaly, pericardial effusion, left atrial hypertrophy), autoimmune disorders (systemic lupus erythematosus), and idiopathic conditions (viral) are other causes. Tuberculosis, syphilis, herpes zoster, and mediastinal abscess have been reported as infectious causes. Inflammatory conditions include pneumoconiosis, heavy metals (Pb, Ag), and rheumatoid arthritis. Bilateral vocal fold paralysis is reported with thyroid surgery, neoplasms, and tuberculosis.

Central nervous system lesions account for 10% of all cases of vocal fold paralysis. Only massive cortical lesions produce paralysis caused by the desiccation of neural fibers from the cortex to the nucleus ambiguus. Although vascular, degenerative, and neoplastic lesions involving the neural pathways of the nucleus ambiguus in the medulla and the vagus nerve occur, most reported cases of vocal fold paralysis involve the recurrent laryngeal nerve.

Sarcoidosis with mediastinal compression as a cause of left unilateral vocal fold paralysis has been reported infrequently. Left-sided injury is thought to be caused by the longer course of the left recurrent laryngeal nerve around the aorta. No publications in the otolaryngology literature describe sarcoid cranial polyneuritis with paratracheal

Accepted for publication September 11, 2002.
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0892-1997/2003 $30.00 +0
and mediastinal compression as a cause of bilateral vocal fold paralysis.

CASE REPORT

A 41-year-old African-American woman presented as an outpatient with the following complaints: hoarseness for 9 months; facial numbness and malaise for 5 months; dysphagia, inability to handle secretions, and weight loss for 5 days; and low-grade fever for 2 days. She did not give a history of upper respiratory tract infection, neck surgery, rheumatoid arthritis, thyroid disease, or Guillain–Barré syndrome. Her medical history included diabetes mellitus, hypertension, and sarcoidosis. One year earlier, she had experienced bilateral blurred vision, decreased visual acuity, eye pain, facial and scalp numbness, slurred speech, bilateral ankle swelling, and joint pain. A diagnosis of neurosarcoidosis and sarcoid iritis was made, and the patient responded to 3 months of treatment with oral prednisone. She did not have a history of smoking.

Physical examination revealed a patient with a very breathy voice and inability to cough or swallow her secretions who was in moderate acute distress and had a temperature of 38.5°C. Upper respiratory tract evaluation, including indirect and fiberoptic laryngoscopy, revealed bilateral vocal fold paralysis in the abducted position, with no neck mass. On auscultation, bilateral basilar rales were appreciated. Neurologic evaluation revealed palatal and neck flexor weakness, with decreased facial sensation. On admission, a chest radiograph revealed hilar, paratracheal, and mediastinal adenopathy. Computed tomography (CT) of the neck revealed a small left thyroid nodule. CT of the chest showed hilar, mediastinal, paratracheal, and apical adenopathy (Figure 1). Magnetic resonance imaging (MRI) scans of the brain and cervical spine were unremarkable, as was a lumbar puncture. A modified barium swallow indicated minimal hyoid movement and elevation, with no mass lesion and a high risk for aspiration. The tensilon test was negative. Acetylcholine receptor antibody titers were unremarkable. A thyroid scan showed a small left-sided nodule. Thyroid function tests, antithyroid antibodies, and beta antithyroglobulin were normal. Cultures for Lyme disease and diphtheria were negative. PPD test was negative. Angiotensin-converting enzyme level was 119 U/L (normal range, 8 to 52 U/L).

Treatment included broad-spectrum antibiotics, intravenous methylprednisolone sodium succinate (Solu-Medrol) (40 mg q 6 hours), and intravenous ranitidine (Zantac). During hospitalization, she developed right eye pain and subsequently left eye pain. Decreased visual acuity, with associated increased intraocular pressures, responded to the addition of brimonidine tartrate (Alphagan) eye drops. On the fourth day of hospitalization, the patient noted improved vocal quality and handling of secretions. Reduction in malaise, facial numbness, and palatal weakness was also exhibited. Follow-up examination utilizing fiberoptic laryngoscopy indicated slight movement of both vocal folds. Full return of motion of both vocal folds was visualized on the seventh day of hospitalization, with return to oral intake prompted by a marked improvement in the modified barium swallow evaluation. A subsequent chest radiograph showed marked reduction in hilar, mediastinal, and paratracheal adenopathy. The patient was discharged on oral steroids.

DISCUSSION

A patient presented with cranial polyneuritis and bilateral paratracheal and mediastinal adenopathy resulting in bilateral vocal fold paralysis in the abducted position. Prompt administration of intravenous steroids resulted in resolution of the vocal fold paralysis.

Sarcoidosis can cause hoarseness by direct laryngeal involvement. A second cause is noncaseating granulomatous compression of the nucleus ambiguous, vagus nerve, or its recurrent laryngeal nerve branch. Nervous system involvement occurs in 5% to 10% of cases of sarcoidosis.4,11 The most common cranial nerve involved by sarcoidosis is the facial nerve, followed by the optic, vagus, and trigeminal nerves, respectively.12 There is a higher incidence of neurosarcoidosis in the African-American population. Cranial polyneuritis of sarcoidosis includes multiple fluctuating and remitting cranial nerve palsies and affects women in their third to fifth decades. Unilateral or bilateral facial palsy, loss of vision, ocular palsies, difficulty swallowing,
Sarcoïdosis as bilateral vocal fold paralysis

Weakness of the palate, hoarseness, taste disturbance, sensory impairment of the face, anosmia, and paralysis of the sternocleidomastoid muscle have all been recorded.\textsuperscript{12,13}

Left recurrent laryngeal nerve compression by sarcoid granulomatous nodules has been reported.\textsuperscript{6–10} Seventy-five percent of patients with sarcoidosis have been identified with aortopulmonary nodal enlargement.\textsuperscript{14} In five reported cases, mediastinal compression from sarcoidosis resulted in vocal fold paralysis on the left side.\textsuperscript{6–10} Three of these patients improved with steroid treatment,\textsuperscript{6,9,10} and one patient recovered spontaneously.\textsuperscript{8} Compression of the recurrent laryngeal nerves can potentially be reversed when inflammatory and edematous changes are present. Delay in treatment has been reported in failure of the vocal fold paralysis to resolve.\textsuperscript{7}

This patient exhibited cranial polyneuritis and paratracheal and mediastinal adenopathy with bilateral vocal fold paralysis. Concomitant clinical resolution of cranial polyneuritis and dramatic radiographic reduction of the paratracheal and mediastinal adenopathy with the return of vocal fold motion occurred during steroid treatment. Bilateral vocal fold paralysis from sarcoïd cranial polyneuritis and paratracheal and mediastinal compression of the recurrent laryngeal nerves has not been found in the otolaryngology/voice literature. Prompt steroid treatment when diagnosis is established is recommended, as reversal of the bilateral vocal fold paralysis occurred in this case.

REFERENCES