CASE STUDY

Left recurrent laryngeal nerve palsy associated with silicosis

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Left recurrent laryngeal nerve palsy associated with silicosis. D. Lardinois, M. Gugger, M.C. Balmer, H.B. Ris. ©ERS Journals Ltd 1999.

ABSTRACT: Left recurrent laryngeal nerve palsy usually results from invasion or compression of the nerve caused by diseases localized within the aortopulmonary window. This study reports the case of a 76-yr-old male with vocal cord paralysis due to lymph node involvement by silicosis. This rare entity was identified by video-mediastinoscopy, which revealed a granulomatous and fibrosed recurrent lymph node encasing the nerve. The nerve was dissected and released from scar tissues. Progressive clinical improvement was observed followed by total and durable recovery of the voice after 15 weeks follow-up.

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Case report

A 76-yr-old male presented with a 10-week history of progressive hoarseness. He also noted weight loss, and pain and swelling of his right elbow. The medical history revealed cigarette smoking for 20 yrs, chronic bronchitis, hypertensive cardiopathy and an occupational exposure to silica particles as a stonecutter, but no history of tuberculosis, trauma or thyroid diseases. A chondrocalcinosis in his right elbow was diagnosed. On the basis of several chest radiographs prior to hospital admission and without obtaining a biopsy, a presumptive stage III sarcoidosis was suggested, and therapy with oral and inhaled corticosteroids was started (prednisolone 30 mg·day⁻¹, budesonide 200 µg *b.i.d.*). Oral corticosteroids were progressively tapered off to 5 mg·day⁻¹. Upon admission, physical examination showed a chronic cough, hoarseness and pain in the right elbow. There was no peripheral lymphadenopathy, hepatosplenomegaly or skin changes. Laryngoscopy confirmed the left vocal cord palsy without intrinsic lesion of the larynx. The white blood cell count (WBC) and blood chemistry revealed no abnormal findings. Lung function testing showed a forced expiratory volume in one second of 2.28 L (2.4 L after inhalation of β_2 -agonists) (91% of predicted), vital capacity 4.02 L (122% pred), total lung capacity 5.94 L (97% pred) and diffusing capacity of the lung for carbon monoxide 6.4 mmol·min⁻¹·kPa (normal 2.9). The chest radiograph showed nodules with interstitial infiltrations, especially in the upper lobes, and enlarged hili. Eggshell calcifications were not observed. However, the computed tomography (CT) scan revealed calcified enlarged hilar and mediastinal lymph nodes (fig. 1). The pulmonary parenchymal findings during the CT scan showed multiple round nodules, predominantly in the upper lobes, and large confluent silicotic masses of ~5 cm in diameter in the upper lung zones, with hilar extension. Despite these findings being suggestive of silicosis, it was suspected that left recurrent laryngeal nerve palsy may be related to sarcoidosis. However, no improvement of the voice disturbance was observed after a few weeks of steroids.

Videomediastinoscopy was then performed to rule out malignancy or infection. It showed a left recurrent laryngeal nerve encased by scar tissue and a dense, irregularly shaped recurrent lymph node (paratracheal left) (fig. 2). The nerve was carefully dissected with scissors, and freed from scar and lymph node encasement whilst under videomediastinoscopy.

Biopsy of the lymph node showed necrosis and fibrosis. The lesions were characterized by hyalinized collagen fibres, surrounded by cellular connective tissue with reticulin fibres, along with dust granuloma presumably related to silicosis (fig. 3). The patient experienced no complications following mediastinoscopy and was discharged one day post-operatively. The doses of corticosteroids were progressively tapered off and stopped 2 weeks after hospital discharge. Vocal cord palsy did not improve during a period of 10 weeks, but progressive total and durable recovery of the voice was observed after 15 weeks of postoperative follow-up.

Fig. 1. – Computed tomography scan showing calcified enlarged hilar and mediastinal lymph nodes.

Fig. 2. – Video mediastinoscopy showing the left recurrent laryngeal nerve encased in a granulomatous fibrosed lymph node.

Discussion

Hoarseness produced by enlarged mediastinal lymph nodes is usually related to malignancies with a poor prognosis. A review of the literature revealed vocal cord paralysis being predominantly related to neoplasm (~20–30%), trauma (~20–30%) or infectious diseases (~10%), whereas malignancies mainly consist of lung, head and neck tumours, thyroid as well as cervical neoplasms, and the infectious diseases, of pulmonary tuberculosis [1, 2]. Other causes of nerve palsy include surgery (neck surgery, cardiovascular surgery, thyroidectomy) (~20%), viral infections (~5%) and diseases of the central nervous system (~10–15%) [1].

It has been demonstrated that the left recurrent laryngeal nerve is more vulnerable to injury than the right nerve, because it is located adjacent to mediastinal structures, such as the great vessels, left atrium, trachea, mediastinal lymph nodes and oesophagus [1]. The left recurrent laryngeal nerve emerges from the vagus nerve. It originates at the ligamentum arteriosum, behind which it loops before ascending in the tracheoesophageal groove up to the neck. It courses posteriorly to the left thyroid lobe, either in front of or, more commonly, behind the inferior thyroid artery, and enters the larynx at the point of articulation between the thyroid and cricothyroid cartilages.

Fig. 3. – Lymph node with anthracosis and fibrosing granuloma on the right. Internal scale bar=500 μ m.

Silicosis causing hoarseness related to recurrent nerve palsy has been reported in only three cases in the literature to date [2–4]. In two of these cases, the diagnosis was also confirmed by mediastinoscopy and lymph node biopsy. In patient of this study, the mediastinoscopy was mainly performed to rule out malignancy, since some tumours grow along nerves without infiltration of other structures [5, 6]. Sarcoidosis was also considered in the present patient, since it has been reported as a rare cause of recurrent laryngeal nerve paralysis, either by granulomatous inflammation of the larynx, neuropathy of the vagus nerve, or by compression of the left recurrent laryngeal nerve by mediastinal lymph nodes [7–11]. However, vocal nerve palsy related to sarcoidosis is considered as steroid-responsive [7], and this was not the case in this study.

The mechanism of infiltration and compression of the nerve by fibrotic and calcified mediastinal lymph nodes in silicosis has not been demonstrated and documented *in vivo* to date. In the current patient, the identification of the left recurrent nerve encased in scar tissue around a dense and irregularly shaped lymph node was made by videomediastinoscopy. These findings along with the history of occupational exposure, and the radiologic signs were diagnostic of silicosis.

Videomediastinoscopy was not only diagnostic, but also possibly therapeutic with disappearance of the hoarseness and recovery of the voice. It is believed that the careful dissection of the left recurrent laryngeal nerve and release thereof from scar tissue was helpful in this matter.

In conclusion, videomediastinoscopy offered a useful approach to the encased left recurrent laryngeal nerve, and resulted in histological confirmation of the disease. This avoided complications of an unjustified long-term therapy with oral steroids for a presumptive diagnosis of sarcoidosis.

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