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Clinical Record

Hoarseness due to *Mycobacterium kansasii*

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Abstract

Objective: To present a case of unilateral vocal fold paralysis due to *Mycobacterium kansasii* induced pressure on the left recurrent laryngeal nerve, a specific aetiology not previously reported in the world literature.

Case report: A 57-year-old Caucasian man presented with a short history of productive cough, fever, hoarseness and 14-kg weight loss. He was a smoker, had an abnormal chest X-ray and was human immunodeficiency virus negative. A sputum sample was positive on direct microscopy for acid fast bacilli. Initially, the patient was treated with Rifater (rifampicin, isoniazid and pyrazinamide) and ethambutol. *Mycobacterium kansasii* was isolated and proved sensitive to this antimycobacterial treatment. Nasoendoscopy revealed diminished movement of the left vocal fold, and a computed tomography scan showed enlarged mediastinal lymph nodes anterior to the aortic arch. After three months of antimycobacterial treatment, the vocal folds were fully mobile at repeat nasoendoscopy, and this coincided with gradual resolution of the patient's hoarseness and weight loss.

Conclusions: There are many causes of unilateral vocal fold paralysis. This case illustrates the importance of anatomical knowledge in reaching a diagnosis, and also presents the first reported case of *Mycobacterium kansasii* creating this clinical picture.

Key words: Vocal Cord Paralysis; *Mycobacterium Kansasii*; Recurrent Laryngeal Nerve Palsy

Introduction

Hoarseness through direct involvement of laryngeal structures can be caused by *Mycobacterium tuberculosis*.[1,2] Whilst uncommon in the UK, this presentation is well recognised in Southern Asia and elsewhere in the world. The occurrence of human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome has increased the incidence of opportunistic infections, including those due to mycobacteriae.[3,4] Hoarseness can also be caused by involvement of structures elsewhere within the thorax. In the UK setting, lung neoplasia would be a common cause of hoarseness and recurrent laryngeal nerve involvement. *Mycobacterium tuberculosis* rarely causes vocal fold paralysis due to left recurrent laryngeal nerve palsy.[5,6] No previously published report of hoarseness or left recurrent laryngeal nerve palsy caused by *Mycobacterium kansasii* could be found.[7–9] Here, we report briefly an unusual and instructive case.

Case report

A 57-year-old Caucasian man presented with a one-week history of productive cough, fever and hoarseness. There was no reported haemoptysis. He was a smoker and had recently lost 14 kg in weight.

A chest X-ray showed patchy shadowing in the upper and middle zones of the right lung. A sputum sample was positive on direct microscopy for acid fast bacilli. The patient was HIV negative.

The patient was treated initially with Rifater (rifampicin, isoniazid and pyrazinamide; Sanofi-Aventis Ltd, Guildford, United Kingdom) and ethambutol, and his fever gradually settled. *Mycobacterium kansasii* was isolated by the Health Protection Agency Mycobacterial Reference Laboratory. The organism was sensitive to the patient's antimycobacterial treatment.

At ENT review six weeks later, the patient was still hoarse. Nasoendoscopy showed partial paralysis with diminished movement of the left vocal fold. A computed tomography (CT) scan showed enlarged mediastinal lymph nodes anterior to the aortic arch (Figure 1).

Three months after the start of the patient's antimycobacterial therapy, nasoendoscopy showed normal and fully mobile vocal folds. This coincided with gradual resolution of his hoarseness and weight loss.

Discussion

In a full review of Medline-listed publications from 1950 and Embase from 1974 to the present, we found no similar cases reported. Our patient's satisfactory outcome following treatment prompted us to report the case, in order to highlight the importance of accurate diagnosis in patients presenting with hoarseness.

Neoplasia can cause vocal fold paresis by direct involvement. However, in the current case, pressure on the left recurrent laryngeal nerve, due to enlarged, nontuberculous lymph nodes, was thought to have partially paralysed the left vocal fold. There was no inflammation of the true vocal folds, arytenoids or false vocal folds. Whilst unusual in Europe, this presentation is not uncommon in India and elsewhere, due to *M tuberculosis*.[1,2,10] As far as we can ascertain, *M kansasii* has not previously been described as

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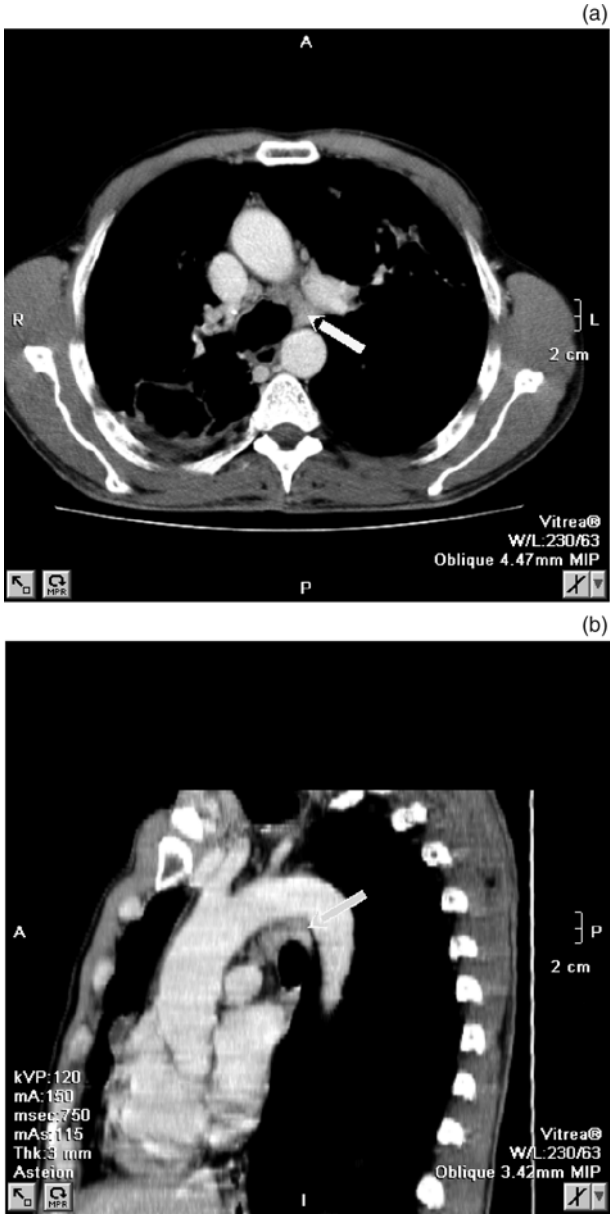

FIG. 1
(a) Axial and (b) sagittal computed tomography images, showing enlarged lymph nodes compressing the left recurrent laryngeal nerve.

causing hoarseness in this way. Response to medication resulted in resolution of the patient's hoarseness.

We do not know how our patient contracted *M kansasii*. This bacterial species has five genotypes, of which type I is particularly seen in clinical practice.[3] The Health Protection Agency Mycobacterial Reference Laboratory uses the polymerase chain reaction method to diagnose *M kansasii*, but does not usually type the organism. The organism's origin is environmental and includes water.[3,4] In our patient's case, there was no evidence of superficial injury which might have provided a portal of entry. He was not diabetic.

In the UK, *M kansasii* is thought to be the most common cause of nontuberculous mycobacterial lung infection in HIV-negative patients. The illness has a similar presentation to tuberculosis but is usually milder. It mainly affects older males and is said to be non-contagious.[9] The typical chest X-ray appearance is of apical right lung disease with cavity formation. *Mycobacterium kansasii* is rarely a sputum culture contaminant. The advised treatment duration is longer than for *M tuberculosis* infection. Occasionally, as might be expected, lung neoplasia can coexist with *M kansasii* infection.[8] Since lymphadenopathy is relatively common in cases of *M kansasii* infection, we were surprised that this presentation had not previously been described in the literature. Cases may however be missed, given the report by Gupta of three asymptomatic patients with paralysis of one vocal fold associated with *M tuberculosis*.[5]

The structures anatomically related to the left recurrent laryngeal nerve at a point anterior and slightly inferior to the aortic arch are as follows. The left recurrent laryngeal nerve passes inferior to the arch of the aorta immediately lateral to the ligamentum arteriosum, with the pulmonary artery lying caudad, before passing posteriorly to ascend in the groove between the trachea and oesophagus. There are superior tracheobronchial lymph nodes in the angle between the trachea and the left main bronchus which are closely related to the left recurrent laryngeal nerve. In the current case, we cannot be absolutely sure of the point at which involvement of the left recurrent laryngeal nerve occurred, between its origin from the vagus nerve anterior to the aortic arch and its ramification within the larynx below the vocal fold. Our patient's CT appearance strongly suggested that enlarged lymph nodes anterior to the aortic arch were compressing the left recurrent laryngeal nerve at this point. Full recovery of left vocal fold function makes this a likely explanation.

- **Hoarseness due to tuberculosis is well described, with direct vocal fold involvement being usual**
- **Left recurrent laryngeal nerve involvement can cause vocal fold paresis**
- **Non-tuberculous infection with *Mycobacterium kansasii*, causing unilateral vocal fold paralysis, is described**
- **Left recurrent laryngeal nerve involvement by *M kansasii* does not appear to have been previously documented**

A number of mechanisms have been proposed for left recurrent laryngeal nerve injury in tuberculosis. Involvement may be acute or chronic. Acutely enlarged lymph nodes pressing on the nerve, or acutely enlarged, inflamed lymph nodes engulfing the nerve, may be responsible. Recovery from hoarseness is a possibility in these cases. Chronic involvement with fibrosis may develop many years after treatment of active tuberculosis, and hoarseness, if present, would tend to persist.[1,2] Fibrosis may occur, it is reported, either where the left recurrent laryngeal nerve winds round the ligamentum arteriosum and is hence vulnerable to injury, or else at the apex of the left lung where pleural fibrosis or even migrated plombage[11] can involve the whole of the vagus nerve. The left recurrent laryngeal nerve is more commonly involved (and hence the left vocal fold) because of its longer intrathoracic course.[6,12] As far as we are aware, nerve damage due to *M kansasii* has only been reported in a case involving the median nerve, with the patient presenting with carpal tunnel syndrome.[13] Most case reports of left recurrent laryngeal palsy relate to *M tuberculosis*.[5] There is one case of atypical tuberculosis (*Mycobacterium avium*) reported by Yew *et al.*, in which post-mortem examination confirmed

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fibrotic entrapment of the left recurrent laryngeal nerve on the apical surface of the left lung.[2]

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References

1 Vyravanathan S. Hoarseness in tuberculosis. *J Laryngol Otol* 1983;**97**:523–5
2 Yew WW, Chau CH, Lee J, Wong PC, Leung CK. Hoarseness due to recurrent laryngeal nerve palsy from intrathoracic mycobacteriosis. *Int J Tuberc Lung Dis* 2001;**5**:1074–5
3 eMedicine [homepage on the Internet]. Medical topics: Mycobacterium Kansasii. http://www.emedicine.com/med/topic1537.htm [4 March 2008]
4 Griffith DE. Management of disease due to *Mycobacterium kansasii*. *Clin Chest Med* 2002;**23**:613–21
5 Gupta SK. The syndrome of spontaneous laryngeal palsy in pulmonary tuberculosis. *J Laryngol Otol* 1960;**74**:106–13
6 Raj B, Bihari K, Kumar P, Chawla RK, Janmeja AK, Chopra RK. Unilateral vocal cord paralysis – unusual sequelae of healed pulmonary tuberculosis. *Indian Journal of Tuberculosis* 1987;**34**:150–2
7 Evans SA, Colville A, Evans AJ, Crisp AJ, Johnston IDA. Pulmonary *Mycobacterium kansasii* infection: comparison of the clinical features, treatment and outcome with pulmonary tuberculosis. *Thorax* 1996;**51**:1248–52
8 Maliwan N, Zvetina JR. Clinical features and follow up of 302 patients with *Mycobacterium kansasii* pulmonary infection: a 50 year experience. *Postgrad Med J* 2005;**81**:530–3
9 Joint Tuberculosis Committee of the British Thoracic Society. Management of opportunist mycobacterial infections: Joint Tuberculosis Committee guidelines 1999. Prepared by a Subcommittee of the Joint Tuberculosis Committee of the British Thoracic Society. *Thorax* 2000;**55**:210–18
10 Shah P, Ramakantan R. Hoarseness of the voice due to left recurrent laryngeal nerve palsy in tuberculosis mediastinitis [letter]. *Arch Otolaryngol Head Neck Surg* 1990;**116**:108
11 Barnett GC, Smith IE, Wells FC, Shneerson JM. Vocal fold palsy due to plombage for tuberculosis. *J Laryngol Otol* 2005;**119**:138–9
12 Sinnatamby CS. *Last's Anatomy: Regional and Applied*, 10th edn. London: Churchill Livingstone, 1999
13 Blue ML, Payne WG, Mannari RI, Moffitt MR, Walusimbi MG, Robson MC. *Mycobacterium kansasii* causing carpal tunnel syndrome. *South Med J* 2002;**95**:1095–8

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