

Actinomycosis of the vocal cord: a case report

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Abstract

A 30-year-old Chinese lady was admitted for hoarseness of voice of one month's duration. Clinical examination revealed a granuloma of the left vocal cord while chest X-ray showed an opacity in the lower lobe of the right lung. The provisional clinical diagnosis was tuberculous laryngitis. A biopsy of the vocal cord lesion revealed inflamed tissue with actinomycotic colonies. Cultures and sputum smears did not reveal any tuberculous bacilli. The patient responded to a 6-week course of intravenous C-penicillin, regaining her voice on day 5 of commencement of antibiotics. A subsequent CT scan of the neck and thorax revealed multiple non-cavitating nodular lesions in both lung fields, felt to be indicative of resolving actinomycosis. She was discharged well after completion of treatment. It was felt that this is a case of primary actinomycosis of the vocal cord with probably secondary pulmonary actinomycosis.

Key words: Granuloma, vocal cord, actinomycete colonies.

INTRODUCTION

Actinomycosis is a saprophytic infection caused by actinomycetes which is part of the normal oral flora. Nearly 60 % of human infections are cervico-facial.¹ The other common sites are abdominal (22 %) and thoracic (15 %).² Less common reported sites include the larynx,³ nasopharynx,⁴ laryngopharynx,^{5,6} oropharynx⁷ and trachea.⁸ A search of published medical literature from 1970 to 1999 revealed only 10 cases of laryngeal actinomycosis.^{1-3,6,9-14} A patient with primary presentation of actinomycosis of the posterior commissure of the left vocal cord is reported here.

CASE REPORT

A 30-year-old Chinese lady was admitted with a complaint of hoarseness of voice for the past one month followed by gradual loss of voice. No history of haemoptysis was elicited. She was otherwise generally well. Indirect laryngoscopy revealed the presence of a granuloma at the lower end of her left vocal cord. Neck nodes were not palpable. Examination of her respiratory system was normal. All other systems did not reveal any abnormality. Chest X-ray showed an opacity in the right lower lobe of the lung. The provisional clinical diagnosis was tuberculous laryngitis. A biopsy of the laryngeal lesion was taken under general anaesthesia and a whitish granulosomatous lesion

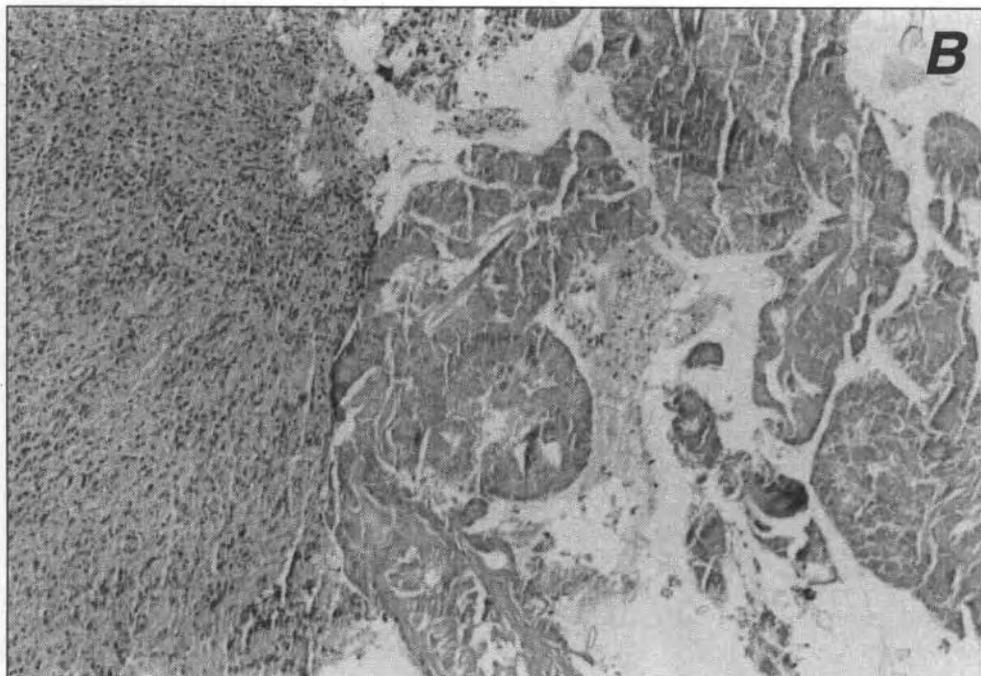
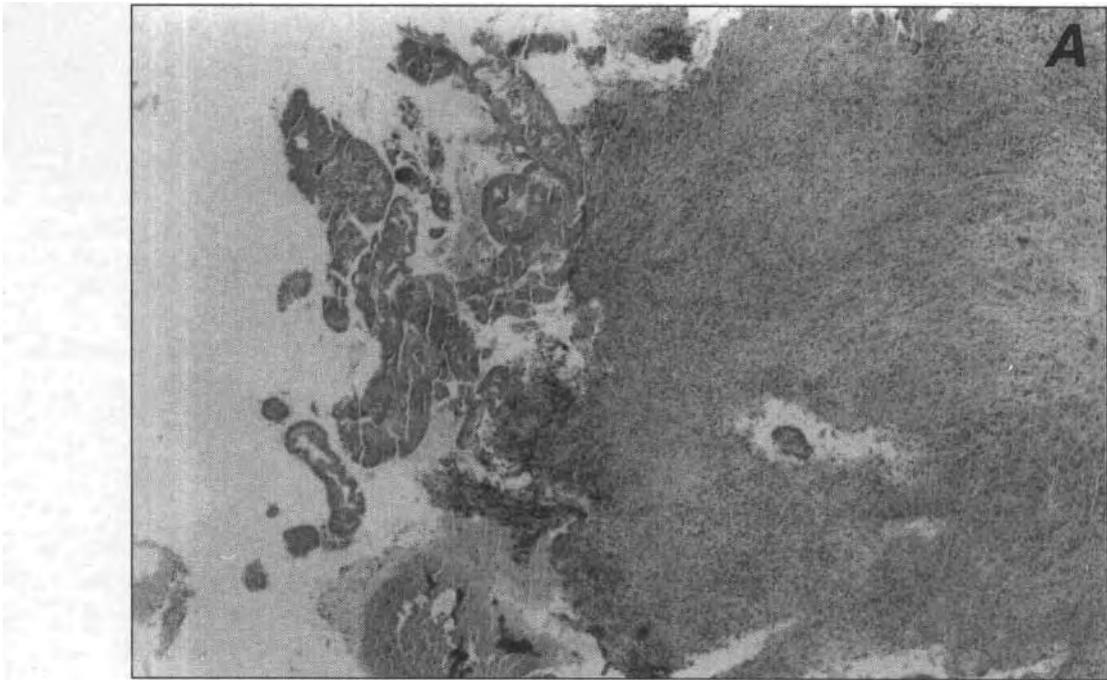
was removed from the posterior commissure of the left vocal cord.

Pathology

The specimen, which consisted of a few pieces of whitish friable tissue measuring 5 mm in aggregate diameter, was sent to the Department of Pathology, Hospital Sultanah Aminah Johor Baru for histopathological examination. Microscopical examination revealed tiny fragments of acutely inflamed fibrous tissue as well as necrotic tissue and numerous filamentous-like bacterial colonies which were Gram stain positive and Ziehl-Neelson stain negative (Figs. 1A & B, 2 & 3). A diagnosis of actinomycosis was then made. Material was also sent for culture and sensitivity for tuberculosis but no growth was detected. No material was sent for anaerobic culture as a diagnosis of actinomycosis was not suspected at that time.

Clinical course

A week later, direct laryngoscopy was carried out a second time under general anaesthesia. Only minimal inflammation was evident at the posterior commissure of the left vocal cord. A piece of tissue sent for anaerobic culture did not grow any organisms. The patient was started on intravenous C-penicillin for a duration of 6 weeks. She regained her voice on day 5 of commencement of antibiotics. A CT scan of her neck and



FIGS. 1A & B : Inflamed fibrous tissue with Actinomycete colonies. (a) H&E X 40. (b) H&E X 100.

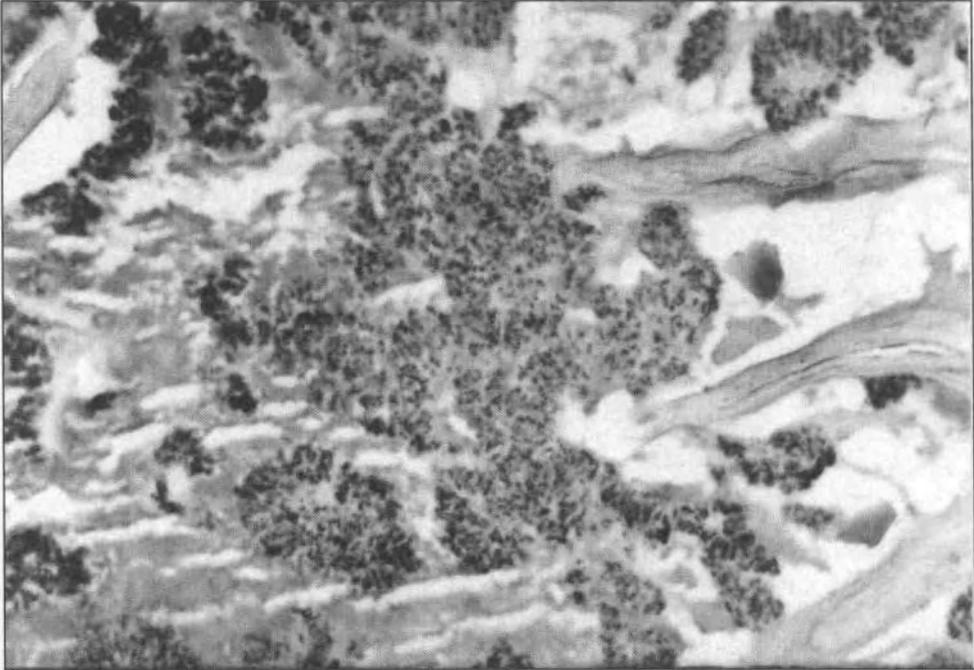


FIG. 2: Filamentous-like, gram positive Actinomycete colonies. Gram stain X 400.

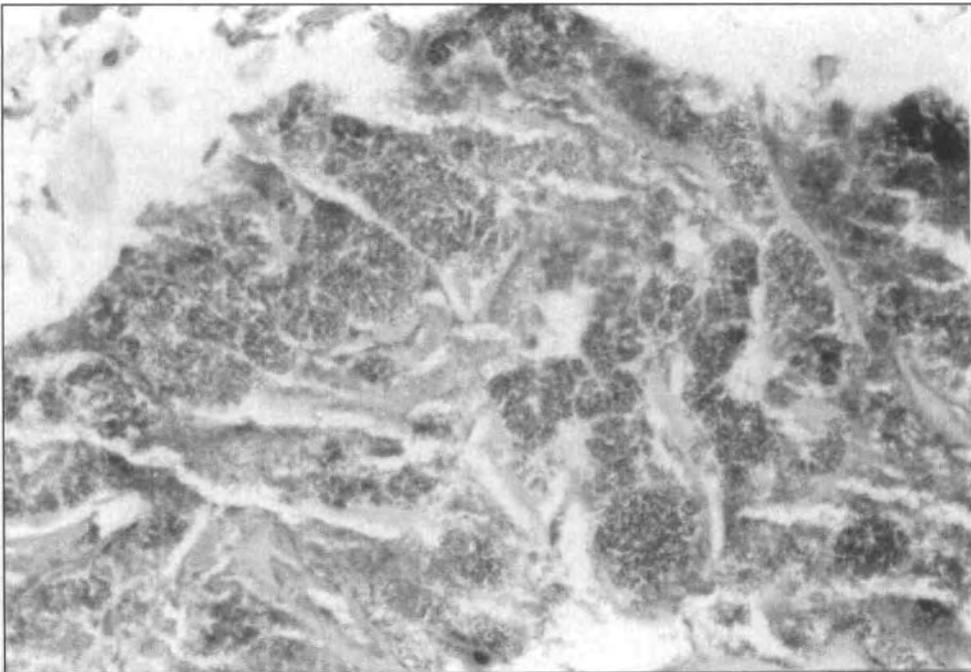


FIG. 3: The Ziehl-Neelson stain shows the Actinomycete colonies to be non acid-fast. Ziehl-Neelson stain X 400.

thorax was also carried out. Multiple nodular lesions were seen in both lung fields. However, no cavitation or calcification was detected. The radiological impression was that of an infective lung disease, for example, tuberculosis, fungal infection or resolving actinomycotic lung abscesses.

On referring to the chest team, it was felt that the most probable diagnosis was that of resolving actinomycosis. Direct sputum smears as well as cultures showed no evidence of acid fast tuberculous bacilli. A repeat laryngeal biopsy towards the end of her treatment showed squamous metaplasia with no evidence of granulomatous inflammation or malignancy. The patient completed her treatment and was discharged well.

DISCUSSION

Actinomycosis is a chronic suppurative, granulomatous and fibrosing disease. In man, it is caused by *Actinomyces israelii* and less commonly by *A. propionica*, *A. naeslundii*, *A. viscosus* and *A. odontolyticus*. These are all normal commensals of the oral cavity. The aetiological agent is usually found in the centre of an abscess or in the purulent exudate. It consists of a few branched filaments or a well-developed granule which may be compact or loosely formed.¹⁵

On the basis of anatomical site of the lesions, most human infections can be classified as cervicofacial, thoracic or abdominal types. Human infections most commonly involve the **cervicofacial area**.^{15,16} Primary actinomycosis of the larynx is extremely rare. Only 10 cases have been reported in the medical literature between 1970 and 1999.^{1,3,6,9-14}

The pathogenesis of actinomycosis is not clear. The consensus seems to be that it is an endogenous infection which is not communicable. Trauma appears to play a role in most cases, initiating the portal of entry for the **organism**.^{1,17} The disease may develop without any known antecedent injury to the oral mucosa¹⁰ as in the case of our patient. Some authors⁴ are of the opinion that other organisms like *Staphylococcus aureus* act in a synergistic fashion to create an anaerobic environment for the *Actinomyces* species to multiply. Paralaryngeal and laryngeal actinomycosis are often an extension of cervical or mandibular infections involving the pyriform sinus^{2,18} or the laryngeal cartilages leading to **perichondritis**.¹⁹ However, our patient appears to have a primary

actinomycotic lesion of the vocal cord with probably secondary pulmonary actinomycosis as a result of downward extension of the infection. The lung lesions are however, not proven histologically. The possibility of pulmonary actinomycosis occurring as a secondary infection within tuberculous lung cavities has also to be kept in mind. It is also possible for such pulmonary infection to spread to the larynx. However, the presence of antecedent tuberculosis is not proven in our patient.

The treatment for actinomycosis is penicillin, which is the drug of choice. This antibiotic has to be given intravenously for a duration of at least three months. Other alternative regimens include clindamycin,⁸ erythromycin, tetracycline,²⁰ lincomycin, minocycline²¹ and amoxicillin.²² Adjunctive surgery, when indicated, is also important in the treatment of this disease.¹⁶

The most common tissue reaction in active lesions of actinomycosis is suppuration with the formation of abscesses that contain actinomycotic granules, which are actually organized aggregates of filaments. Granulation tissue may also be seen.^{15,23,24} Most actinomycete granules contain numerous delicate branched filaments that are gram positive, non acid-fast and sometimes beaded.^{23,25} Actinomycete filaments are coloured deep bluish-purple and are well demonstrated with the tissue gram stains. They are not stained by H&E and PAS stains.²³

A definitive diagnosis cannot be based on histology alone. Cultural studies are needed to accurately diagnose the disease and to identify the aetiological agent. Unfortunately, in the case described, no tissue was sent for anaerobic culture during the initial biopsy. Instead material was sent for culture and sensitivity for tuberculosis. A repeat biopsy revealed only minimal inflammation, indicating that the laryngeal lesion had been completely removed. It is not unexpected that by then, the material sent for anaerobic culture gave negative results.

In short, the diagnosis of actinomycosis in our patient depended on information gained on special stains on the histopathological material as well as the clinical response of the patient to intravenous penicillin. It is important to correlate both histological as well as microbiological findings as other filamentous bacteria, such as *Nocardia*, can also form granules that are morphologically indistinguishable from those seen in actinomycosis. Furthermore, one cannot rely on the acid-fastness of the nocardiae within an organised granule to differentiate these

organisms from those of the Actinomyces and related genera because Nocardia species are not invariably acid fast.²⁵

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