

Primary endobronchial actinomycosis

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ABSTRACT: A male farmer referred for fever, cough and haemoptysis, presented, at bronchoscopic examination, a large mass occluding the middle lobe bronchus. No lung involvement was visible on chest X-ray. Histological examination showed an actinomycotic granule in the bronchial submucosa. The histological findings indicate that aspiration of contaminated material from the upper alimentary tract may have caused the disease.

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Actinomycosis is usually a chronic localized disease characterized by multiple indurated abscesses and sinus tracts usually found in the face, neck, chest or abdomen [1-3]. Males are affected almost twice as frequently as females and the illness seems most common amongst farmers and in rural areas [4]. Human infections are in general produced by direct invasion of contiguous tissues by *Actinomyces israelii* commonly present in the mouth or bowel [3, 4]. Only occasional reports of human infections caused by other species such as *A. bovis*, *A. eriksonii* and *A. naeslundii* have been described [4, 5].

Usually actinomycosis spreads locally and if vital organs are involved it may be fatal. Involvement of major bronchi, rare in cases of pulmonary lesions, is exceptional as primary infection [6].

We describe a case of solitary bronchial actinomycosis which presented as a pseudoneoplastic lesion.

Case History

A male farmer aged 60 yrs was referred to the department of respiratory disease of the USL 30, Siena, because of a fever, cough and haemoptysis. Six months prior to admission, the patient had undergone an emergency operation for a ruptured intracerebral aneurysm. Post-operatively he was comatose in a medical intensive care unit for a month.

Chest X-ray and tomography showed atelectasis of the right middle lobe, but no signs of pulmonary actinomycotic lesions were detected.

At bronchoscopy a large firm mass occluding the middle lobe bronchus was present. It was grey to pinkish in colour and bled easily after biopsy was taken. The macroscopic aspect strongly suggested a neoplasm. Tissue fragments were taken for histological examination. Serum osmolality, liver and renal function tests, urinalysis, and routine blood tests were within normal limits.

On the basis of the histological diagnosis the patient underwent two months' therapy with benzyl penicillin followed by erythromycin for six months.

A bronchoscopic examination performed after the antibiotic therapy showed a regression of the lesion with only a small roughness left on the anterior bronchial wall. The antibiotic therapy was continued for another two months.

At the last clinical examination, performed two years later, laboratory tests and bronchoscopy were within normal limits.

Histology

A small single granule typical of actinomycosis was present within the submucosa of the bronchial wall. The granule, oval in shape, was formed by an amphophilic central granular mass with a radiating fringe of eosinophilic clubs (fig. 1).

The organisms were not clearly distinguishable with the haematoxylin and eosin stain. They were black with methenamine silver stain (fig. 2), periodic-



Fig. 1. - Typical granule with dense inflammatory infiltrate in the bronchial submucosa. Haematoxylin and eosin. $\times 40$

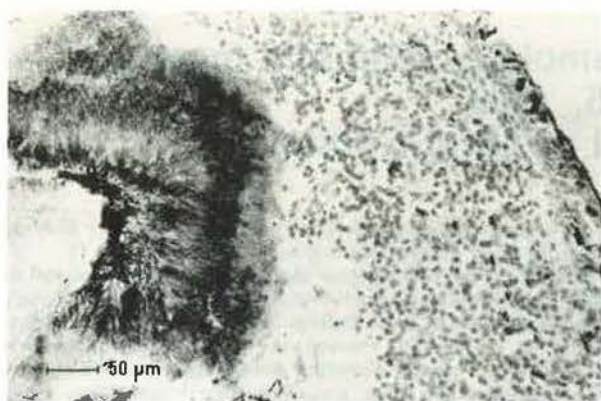


Fig. 2. - Higher magnification of the granule stained with methenamine silver.

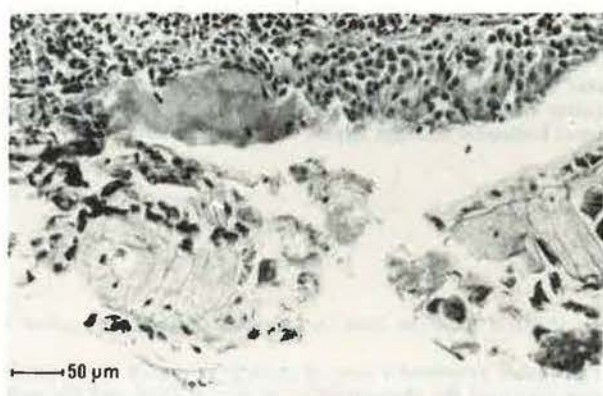


Fig. 3. - Vegetable cells strictly connected with a granule on the bronchial epithelium. Haematoxylin and eosin.

acid-Schiff (PAS) and Gram-positive but not acid-fast with the Ziehl Neelsen staining method. They were slender, branching, beaded and on average 0.6μ in width. A conspicuous, dense, inflammatory infiltrate was present around the granule. It consisted mainly of plasma cells with a moderate number of lymphocytes densely aggregated at the periphery of the granule. Rare eosinophils and macrophages with foamy cytoplasm were also present. No necrosis, pus or collagen fibres were visible. A peculiar feature in the biopsy was the presence of vegetable cells intermingled with actinomycetes strictly confined to the bronchial epithelium (fig. 3).

Discussion

A case of solitary bronchial actinomycosis detected in a farmer is presented. The diagnosis of actinomycosis was made from histological sections of the bronchial biopsy.

About 60% of cases of actinomycosis occur in the region of the mouth, face or neck, the portal of entry being dental or tonsillar where the organism is a common commensal or saprophyte. About 25% of cases of actinomycosis involve the ileocaecal region, with or without appendicitis or extension through the portal veins to the liver. The remaining 15% of cases are localized in the lung [3, 4]. Rare cases of lesions in the brain

[4], heart valves [4, 7], anorectal area or subcutaneous tissues of the extremities have been reported [4].

The unique localization of the disease in the bronchial wall has to be considered an exceptional event. In all previously reported cases bronchial actinomycosis has resulted from extension of intrapulmonary disease into the bronchial submucosa [8]. However, superficial actinomycotic bronchitis was described many years ago [9]. To our knowledge, only one case of primary bronchial localization has been reported previously [6]. Involvement of pulmonary parenchyma from a primary bronchial infection has not been described [10].

In our patient no other localization could be detected. The organism may have reached the bronchial wall directly from the mouth or tonsillar foci as usually occurs in lung infections. Surgical procedures or trauma are considered possible antecedent factors in the spreading of actinomycetes from their site of origin [4].

In our case the contamination of the bronchial wall may have followed the endotracheal intubation undertaken during the recovery from the intracerebral aneurysm. Aspiration of material from the upper alimentary tract may have occurred, as suggested by the presence of vegetable cells with actinomycetes in the bronchial specimen.

The patient was treated by antibiotic therapy and no signs of disease are present two years later.

In the presence of an endobronchial mass, the possibility of an actinomycotic lesion should be considered in a differential diagnosis along with neoplastic proliferation.

References

1. Weed LA, Buggenstoss AH. - Actinomycosis. A pathologic and bacteriologic study of twenty-one fatal cases. *Am J Clin Pathol*, 1949, 19, 209-216.
2. McQuarrie DG, Hall WH. - Actinomycosis of the lung and chest wall. *Surgery*, 1968, 64, 905-911.
3. Wright GP, Heard BE. - The lungs. In: Systemic pathology, WStC. Symmers ed., Churchill Livingstone, Edinburgh, London and New York, 1980, pp. 347-348.
4. Brown JR. - Human actinomycosis: a study of 181 subjects. *Hum Pathol*, 1979, 4, 319-330.
5. Coleman RM, Georg LK, Rozell AR. - *Actinomyces naeslundii* as an agent of human actinomycosis. *Appl Microbiol*, 1969, 18, 420-426.
6. Kurgan J, Szymczak M. - Promienica oskrzela (bronchial actinomycosis). *Pneumol Pol*, 1986, 54, 363-365.
7. Dutton WP, Garrington GE. - Cardiac actinomycosis. *Dis Chest*, 1968, 54, 65-67.
8. Bates M, Cruickshank G. - Thoracic actinomycosis. *Thorax*, 1957, 12, 99-124.
9. Cope Z ed. - Actinomycosis. Oxford University Press, London, 1938.
10. Lee M, Berger HW, Fernandez NA, Tawney S. - Endobronchial actinomycosis. *Mt Sinai J Med*, 1982, 49, 136-139.

RÉSUMÉ: Un fermier de sexe masculin, adressé au service pour fièvre, toux et hémoptysie, montre à l'examen bronchoscopique une large masse obstruant la bronche lobaire moyenne. Les clichés thoraciques ne montraient aucune atteinte pulmonaire. L'examen histologique montre qu'il s'agit d'un granule actinomycotique dans la sous-muqueuse bronchique. Les signes histologiques indiquent que l'aspiration de matériel contaminé en provenance du tractus alimentaire supérieur pourrait avoir provoqué la maladie.