thin Silicone rubber tube and remained free of symptoms and had no muscular contractions on ECG. The break in the ECG recording is an artefact corresponding to the pacemaker impulse. Time bar 0.2 sec. Vertical bar 0.5 mV.

Report of operation. At the Department of Thoracic Surgery, Karolinska Hospital on April 14, 1972, a horizontal incision was made immediately above and below the middle part of the right clavicle. The electrode wire was exposed and pulled out through the lower incision. A 1 cm long defect in the cable insulation was found and was repaired with a thin Silicone rubber tube and Kodak medical adhesive. The incisions were closed and a new pacemaker generator was placed subcutaneously in the left pectoral region.

The patient made an uneventful recovery. At neurologic examination four months after the operation, he had regained full motor and sensory function of the right upper limb. There was still some weakness in the shoulder and arm; he could not completely raise his arm above the head. He was therefore likely that the intensive arm movements which preceded the arm jerks added to a partial insulation defect not extending down to the steel core of the cable. That the insulation material had undergone such changes because of 5% years’ use, or that it did not withstand the stresses in conjunction with the intense arm work, appears improbable. Before this type of electrode came into clinical use, it had been subjected in the laboratory to mechanical strains corresponding to several decades of clinical use. It should perhaps be added here that in the Department of Thoracic Surgery, Karolinska Sjukhuset in Stockholm, up to January 1973, 700 transvenous electrodes had been implanted, some 500 of which more than three years previously (in fact, in 1972 some electrodes had been in use for ten years), without sign of limited life of the cable insulation in a single case.

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Pulmonary Monosporosis: Report of a Case with Precipitating Antibody*

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A diabetic patient developed a pulmonary mycetoma with Monosporum apiospermum in an old tuberculous cavity. Precipitating antibody to an isolate of the causative organism as well as the complete fungus, Allescheria boydii, was present prior to but not following curative pulmonary resection.

Monosporum apiospermum, the asexual form of Allescheria boydii, is a common cause of mucochromyofusosis of the foot. It is an ubiquitous organism and, on occasion, may cause pulmonary infection. Such infection typically occurs in the form of an opportunistic intra-cavitary mycetoma, and is, in many respects, analogous to the pulmonary aspergilloma.

**METHODS**

Specimens submitted for fungus studies were cultured on Saboraud’s media at room temperature. Identification was made by examination macroscopically and microscopically and confirmed by the Washington State Laboratory, Mycology Section, and by the Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine.

Antigens to A boydii and M apiospermum were prepared from harvested mycelia grown in stirred glucose peptone broth for three days at room temperature. These were subjected to a single freeze-thaw cycle, homogenized in a Waring blender and disintegrated ultrasonically. After low-speed centrifugation, the supernate was concentrated approximately ten-fold by dialysis against polyethylene glycol, subjected to high-speed centrifugation and lyophilized. Concentrations for use in immunodiffusion tests (30 and 10 mg/ml) were determined by titration against reference rabbit antiserum. Immunodiffusion tests were made with 1 percent borate buffer agar (pH 8.2). After reacting for three days at room temperature, plates were washed to remove unprefictitated protein, dried in air and stained with naphthalene black.

**CASE REPORT**

A 52-year-old white woman, who had been a lifelong resident of rural Oklahoma until nine months prior to admission, was referred as an active tuberculosis suspect. Nine years previously she had far-advanced active pulmonary tuberculosis. She completed one year of treatment with isoniazid and PAS with the sputum becoming negative for acid-fast bacilli, but there was a residual cavity. A preemployment chest x-ray film four months prior to admission revealed a 4.5 cm right apical cavity. Six weeks prior to admission, she developed a lingering cold characterized by myalgia, anorexia, and cough productive of brown sputum. Five days prior to admission, hemoptysis developed and she was admitted to a community hospital where bronchoscopy revealed no visual abnormalities but a bronchial washing was reported positive for acid-fast bacilli on smear examination.

The patient was an obese woman in no acute distress. The pulse was 80, blood pressure 170/90, respirations 14, temperature 36.8°C. Course rales were intermittently audible over the left side of the chest. There was no clinical cardio-megaly, nor were there abnormal gallops or murmurs. The remainder of the physical examination was unremarkable.

The hematocrit was 50 percent. White blood cell count was 12,650 per mm3 with 50 percent neutrophils, 27 percent lymphocytes, 2 percent monocytes, 20 percent eosinophils, and 1 percent basophils. Fasting blood sugar was 290 mg per deciliter. The intermediate strength (5 TU) Tween-stabilized purified protein derivative showed 25 mm of induration at 48 hours. The coccidioidin skin test was negative; however, the histoplasmin skin test showed 5 mm of induration. Two sputum specimens cultured for fungi grew Monosporum apiospermum. Serum precipitin tests for Aspergillus fumigatus and A niger were negative.

Seven sputum concentrates and eight sputum cultures for acid-fast bacilli were negative. Pulmonary function studies revealed a vital capacity of 2.5 liters (91 percent predicted), and FEV1/FEV of 0.54. After bronchodilators, the vital capacity was 2.79 liters (100 percent predicted), and FEV1/FEV 0.59. The chest x-ray film (Fig 1) demonstrated biapical fibrosis with hilar retraction and a 2.5 cm right apical cavity. There was also a soft tissue density surrounding the cavity and a calcified density in the right upper hilar area.

By the time of admission, hemoptysis had ceased. Treatment was initiated with isoniazid, ethambutol and streptomycin. Fiberoptic bronchoscopy revealed extrinsic compression of the right upper lobe bronchi which was attributed to the

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*Tests performed by Center for Disease Control, Atlanta, Georgia.*

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![Figure 1. Chest x-ray film four months prior to admission (L) and on admission (R). The right apical cavity has filled with a soft density.](image)
calcific density noted on chest x-ray film. Right upper lobe bronchial washings revealed fungal hyphae but no malignant cells or acid-fast organisms. Repeated blood glucose determinations confirmed diabetes mellitus which was controlled with dietary therapy and weight reduction. After a 42 day stay, she was discharged on isoniazid and ethambutol therapy. Two weeks following discharge, hemoptysis recurred. Repeat fiberoptic bronchoscopic examination again showed only extrinsic compression of the right upper lobe bronchus. A right thoracotomy with right upper lobectomy was then performed. The surgical specimen revealed a "fungus ball" within an old tuberculous cavity and marked bronchiectasis of the apical and posterior segmental bronchi. A calcified cell or acid-fast organisms. Repeated blood glucose determinations showed no response. Our patient was found to have precipitating antibody against antigens from A. bodii and M. apiospermum.

The data for the small number of reported patients with pulmonary monosporosis indicate that the features of this disease are nearly identical to those of pulmonary Aspergillus mycetoma. Until more data are available, it would appear that diagnostic procedures, including serum precipitin testing, found useful for evaluating patients with Aspergillus mycetoma, will also prove useful for those with Monosporium-Allescheria mycetomas.

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