Aspergilloma and Precipitin Test: Report of Two Cases

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Abstract

Two cases of pulmonary aspergilloma were reported. The first case was Chinese who has smoked 10-20 cigarettes per day since he was 16 years old and was diagnosed pulmonary tuberculosis since he was 62 years old. The second case was 82 years Thai female farmer and was diagnosed pulmonary tuberculosis when she was 72 years old. Both were treated with full course of anti-tuberculous drugs. Their complaints were dyspnea, cough with occasional bloody sputum. Sputum cultures for M. tuberculosis were negative. Chest X-rays revealed fungus balls inside the dry cavities. Antibodies against A. fumigatus were detected in precipitin lines using gel diffusion method which yield the highest titer of 1:8. A. fumigatus was also isolated from the first case.

Aspergilloma is a solid "ball" of fungal mycelia produced in situ. It is usually formed over several months or years within a preexisting cavity. It may follow tuberculosis or other types of cavitating lung disease such as bronchiectasis. Aspergilloma may also form in cavities caused by other fungal infections such as coccidioidomycosis.

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Aspergillus species are widely distributed in nature, and hence available as infectious agents. Pulmonary tuberculosis is the fourth most important cause of death in the Thai population, and the leading cause among infectious diseases. Aspergillosis had been sporadically reported, usually during clinical diagnosis based on surgery or autopsy. In Thailand, the greatest number of cases of surgical aspergillosis, including aspergilloma, have been reported from the Central Chest Hospital, Nontaburi, where 55 patients, aged 16-69 years have been found infected. We would like to
report two cases of aspergilloma from the Anti-Tuberculosis Association Hospital, diagnosed by chest X-ray and precipitating antibodies against *Aspergillus* species.

Case No. 1. A Chinese man 72 years old had a history of pulmonary tuberculosis since he was 62 years old. He attended the Anti-Tuberculosis Association Hospital in 1984, when chronic pulmonary tuberculosis was diagnosed and an anti-tuberculous drug was prescribed. His sputum for acid-fast bacilli was negative on several occasions. Since 1985, the patient had developed cough, dyspnea, dizziness and recurrent hemoptysis, and has been admitted periodically to the hospital.

The patient looked old for his age on last admission (12 March 1990). Auscultation revealed crepitation and rhonchi at right upper lung; the others were within normal limits.

Laboratory examination revealed hemoglobin 15 gm per cent, hematocrit 50 per cent, white blood cells 11, 600/cu.mm., with 85 per cent neutrophils and 15 per cent lymphocytes. Results of urine, faeces and blood chemistry were not remarkable.

PA film of the chest showed fibronudular lesions involved both upper lungs associated with some cystic like appearance and loss of the right lung volume. There was a crescent of air around a soft mass of tissue in the right upper lobe representing an intra-cavitary fungus ball of aspergilloma (Fig. 1). Sputum was sent for mycological study for 3 consecutive days and revealed growth of *Aspergillus fumigatus*. The serum was tested for *Aspergillus* antibodies, and revealed precipitin to *Aspergillus fumigatus*, *A. flavus* and *A. niger* at titers of 1:8, 1:1 and 1:1, respectively.

The patient was a Chinese actor. He had smoked 10-20 cigarettes per day between the ages of 17 to 62.

Case No. 2. A Thai woman 82 years old who had a history of pulmonary tuberculosis since age 72. On 7 August 1990 she was admitted to the Anti-Tuberculosis Association Hospital because of dyspnea, malaise and recurrent hemoptysis. Chronic obstructive pulmonary disease with cachexia was diagnosed.

On admission the patient looked cachetic. Auscultation revealed crepitation and rhonchi left upper lung; the other was within normal limits.

Laboratory examination revealed hemoglobin 11 gm per cent, hematocrit 35 per cent, white blood cells 13, 100/cu.mm., with 80 per cent neutrophils and 20 per cent lymphocytes.

PA film of the chest revealed fibro-nodular infiltration in left lung with some loss of the lung volume, most likely representing chronic pulmonary tuberculosis. Two soft tissue masses were noted over the left upper lobe, measuring about 4.5x5.5 cm and 4x3.5 cm in diameter with an appearance of crescent sign, highly diagnostic of the fungal balls. Minimal fibrotic with emphysematous change was also seen in the right upper lobe scar. The visualized bony thorax was intact. Sputum was sent for mycological study for 3 consecutive days, but revealed no growth. The serum was tested for *Aspergillus* antibodies and revealed precipitin to *A. fumigatus*, *A. flavus* and *A. niger* at titers of 1:8, 1:1 and 1:1, respectively.

The patient was a Thai farmer without any history of smoking.

**DISCUSSION**

Aspergillomas are most commonly associated with either active or healed tuberculosis. In a survey of 544 patients with post tuberculous cavities in 55 chest clinics in Great Britain, 17 per cent of the patients had definite aspergilloma and 3 per cent had probable aspergilloma. We studied 105 patients who attended Anti-Tuberculosis Association Hospital and found two cases, one with confirmed and the other with probable aspergilloma. The important symptoms were recurrent hemoptysis, cough and malaise. Physical examination revealed diminished breath sound in the area corresponding to the cavity. Blood examination usually was not remarkable. We were able to culture the fungus from the sputum in only one case but *Aspergillus* antibodies showed high titers in both when tested with *A. fumigatus*. 

![Fig. 1 PA film of case No. 1 showing the crescent of air around the soft tissue mass in the right upper lobe, representing the intra-cavitary fungus ball of aspergilloma.](image-url)
indicating that aspergilloma was caused by *A. fumigatus*, *A. flavus* or *A. niger* respectively. We were able to culture the fungus from the sputum in only one case but Glimp and Bayer found an overall incidence of hemoptysis in cases of aspergilloma of 74 per cent, and sputum cultures were positive in only 50 per cent of cases, whereas *Aspergillus* precipitin was found in 92 per cent of cases.

The radiologic appearance consisted of a homogenous opacity occupying part of a round or oval cavity and partially surrounded by a radiolucent crescent (Monad's sign). Aspergilloma can occur in the paranasal sinuses and orbit in addition to the lungs. This type of aspergilloma is commonly found in the Sudan, and is the most common cause of unilateral proptosis.

The natural history of aspergilloma is quite variable. Lesions may remain stable for long periods of time or may grow or shrink along with the surrounding cavity. Spontaneous lysis has been reported in up to 10 per cent of aspergilloma cases. Therefore a conservative approach, including careful follow-up, appears indicated in most patients. Surgical intervention is required when massive hemoptysis occurs, with blood loss greater than 600 ml in 24 h.

CONCLUSION

Two cases of aspergilloma complicated pulmonary tuberculosis were reported. The patients had definite symptoms of recurrent hemoptysis, cough and malaise. Clinical diagnosis was based on X-ray findings and antibodies to *Aspergillus* species, which revealed high titers to *A. fumigatus*. The patients still attend Anti-Tuberculosis Association Hospital with symptoms of chronic obstructive pulmonary disease.

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REFERENCES