

## Short reports

### Invasion of a bronchial carcinoma by *Aspergillus fumigatus*

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Colonisation by *Aspergillus fumigatus* is a frequent complication of diseases that cause intrapulmonary cavities, but it is rare for colonisation to occur within the cavity of a bronchial carcinoma. I report a case where the necrotic centre of a bronchial carcinoma was invaded by *A. fumigatus*.

#### Case history

A 59-year-old engineering inspector presented with a four-month history of pain in his right shoulder and haemoptysis. On examination there was early finger clubbing, dullness to percussion over the right clavicle, and diminished breath sounds at the right apex. Neurological signs were absent.

Radiographs and tomograms of the right apex showed a cavity in the contracted right upper lobe. Sputum did not contain neoplastic cells, and tubercle bacilli were not cultured, but direct smears repeatedly showed large numbers of *A. fumigatus* hyphae, and this organism grew on culture. Mantoux test with ITU resulted in 8 mm of induration. At fiberoptic bronchoscopy there was pus issuing from the right upper lobe. Histology of a bronchial biopsy specimen showed squamous metaplasia of the bronchial epithelium, and bronchial brushings showed no malignant cells. Immunoelectrophoresis showed slight increase in the IgG fraction, although precipitating antibodies to *A. fumigatus* were not found. There was a leucocytosis of  $12.5 \times 10^9/\text{dl}$ .

Histological examination of material obtained from the right upper lobe by a percutaneous "tru-cut" needle biopsy showed numerous septate branching hyphae invading necrotic tissue. No identifiable cells were found. The clinical findings suggested a bronchial carcinoma, but as this had not been confirmed and as there was evidence of invasive aspergillosis, treatment with amphotericin B was started.

Within three days of starting treatment, the patient developed loss of light touch over the distribution of T<sub>1</sub>, followed by signs of spinal cord

compression. A myelogram confirmed an extradural block at the level of T<sub>4</sub>. The patient's condition rapidly deteriorated and he died.

At necropsy the apical segment of the right upper lobe was collapsed and fibrotic. There was a subpleural mass with areas of solid tumour surrounding a breaking down necrotic centre, the tissue extending into the thoracic inlet affecting brachial plexus, upper thoracic vertebrae, and intravertebral canal with extradural extension.

No distant metastases were found. Histology showed a poorly differentiated squamous cell carcinoma, the necrotic centre being invaded by mycelia of *A. fumigatus* (see figure). There was little inflammatory response, no invasion of viable tissue, and no mycetoma formation.

#### Discussion

Cavitation within a bronchial carcinoma occurs in about 8% of cases, and in view of the frequency of *A. fumigatus* in the atmosphere (Mullins *et al*, 1976) it is surprising that colonisation of these cavities by the fungus is not recognised more often. When *A. fumigatus* infection does complicate malignant disease it is usually seen in patients with haematological or lymphoreticular neoplasms receiving immunosuppressants or corticosteroids, or with a leucopenia. Moreover, the three previously described cases of *A. fumigatus* colonisation of cavitating carcinomas were all recognisable radiographically as aspergillomas within the cavities, with antibodies to *A. fumigatus* present in one case (Warembourg *et al*, 1965; Mays and Hawkins, 1967; Torpoco *et al*, 1976). The absence of antibodies and fungus ball formation in our case, together with the histological appearances, suggested an active process of invasion.

In contrast to our experience of the rarity of aspergillar colonisation of cavitating tumour, tuberculous cavities are colonised relatively often. About 34% of patients with post-tuberculous



Figure Histology showing mycelia of *A fumigatus* invading necrotic areas of the squamous cell carcinoma ( $\times 137$ ).

cavities have antibodies to *A fumigatus*, 17% having radiographic evidence of an aspergilloma (BTTA, 1970). Poorer ventilation of cavities within a carcinoma and its shorter time span may explain the lower frequency of colonisation by *A fumigatus*.

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#### References

- BTTA (1970). Aspergillomá and residual tuberculosis cavities: the results of a resurvey. *Tubercle*, **51**, 227–245.
- Mays, E E, and Hawkins, J A (1967). Cavitory bronchiolar carcinoma with an intracavitary aspergilloma. *American Review of Respiratory Disease*, **95**, 1056–1060.
- Mullins, J, Harvey, R, and Seaton, A (1976). Sources and incidence of airborne *Aspergillus fumigatus* (Fres). *Clinical Allergy*, **6**, 209–217.
- Torpoco, J O, Yousuffuddin, M, and Pate, J W (1976). Aspergilloma within a malignant pulmonary cavity. *Chest*, **69**, 561–563.
- Warembourg, H, Ribet, M, Lekieffre, J, Bertrand, M, Demaille, A, and Houcke, M (1965). Aspergillome developpe dans un cancer bronchiolaire excavé. *Lille Médical*, 3<sup>e</sup> Série, **10**, 176–178.

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