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Case report

Polypoid endobronchial extension from invasive thymoma

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Summary. A case of invasive thymoma which was manifest clinically as bronchial obstruction and metastatic liver tumour is presented. Autopsy revealed a unique polypoid endobronchial extension of the neoplasm. This represents a previously unrecognized pattern of secondary bronchial involvement by invasive thymoma.

Key words: Bronchi – Bronchial Neoplasms – Lung Neoplasms – Thymoma – Thymus Neoplasms

Introduction

Invasive thymomas are characterized by an infiltrative growth and extension into the neighboring structures including pleura and lungs, pericardium, great vessels, diaphragm etc. (Krakower and Cotsonas 1965; Guérin and Guérin 1966; Akeda and Ishii 1970; Rosai and Levine 1976; Garfield 1983; Marchevsky and Kaneko 1984; Hofmann et al. 1985; Marino and Müller-Hermelink 1985; Honma and Shimada 1986). We have experienced an extremely unusual case of invasive thymoma which was detected clinically as bronchial obstruction and metastatic liver tumour. At autopsy, the tumour was found to invade and occlude the left upper lobe bronchus with polypoid endobronchial tumours extending into the peripheral bronchial branches of the same lobe. To our knowledge, no similar case has been described in the literature.

Case report

The patient, 58 years of age, had worked in a copper mine for 25 years. He had been admitted to the Rosai Hospital for Silicosis in 1975 and 1981 respectively. He had smoked several cigarettes a day for 40 years. In June 1982, he was readmitted to the same hospital because of an abnormal shadow in the left lung field. Bronchoscopy revealed obstruction of the left B^3 bronchus by a necrotic mass. ECG showed low voltage and myocardial damage. In July, haemoptysis and bloody pleural effusion were noted. Chest CT revealed neoplastic thickening of the left pleura. In October, a smooth-surfaced, movable tumour of hen's egg size was felt in the right hypochondrium. Coeliac angiography suggested a benign liver neoplasm. This tumour was removed by partial liver resection. The cut surface disclosed a well demarcated and lobulated, grayish-white and rather medullary soft mass with foci of haemorrhage, measuring $7 \times 6 \times 5$ cm in greatest dimension (Fig. 3a). Histological examination revealed an encapsulated tumour consisting of sheets of bland epithelial cells accompanied by varying degrees of infiltration of lymphocyte-like small round cells (Fig. 3b&c). Foci of whorl-like arrangement of the tumour cells were also seen. Thereafter, repeated bronchoscopic examinations with multiple biopsies revealed a similar tumour in the bronchial mucosa with intact mucosal epithelium. Cyclophosphamide was administered, but both the tumour size and the amount of pleural effusion were unchanged. The patient's general condition gradually deteriorated with accumulation of ascites, and he died of cardiac failure in August 1983.

Results

The anterior mediastinum was occupied by an ill-defined firm, partly calcified tumour, measuring 10×8 cm. This infiltrated the neighboring structures including the pericardium and heart, both pleurae and the medial portion of both upper pulmonary lobes (Fig. 1a). The cut surface of the left lung revealed direct invasion of the tumour into the left upper lobe bronchus and its major branches, with polypoid masses projecting into and occluding the bronchial lumina (Fig. 2a). Some of the peripheral bronchial branches in the left upper lobe showed similar polypoid masses, which were considered to be intracanalicular extensions from the central lesions. Both lungs bore several small metastatic deposits and disseminating nodules in the pleura. The pericardial cavity was almost to-

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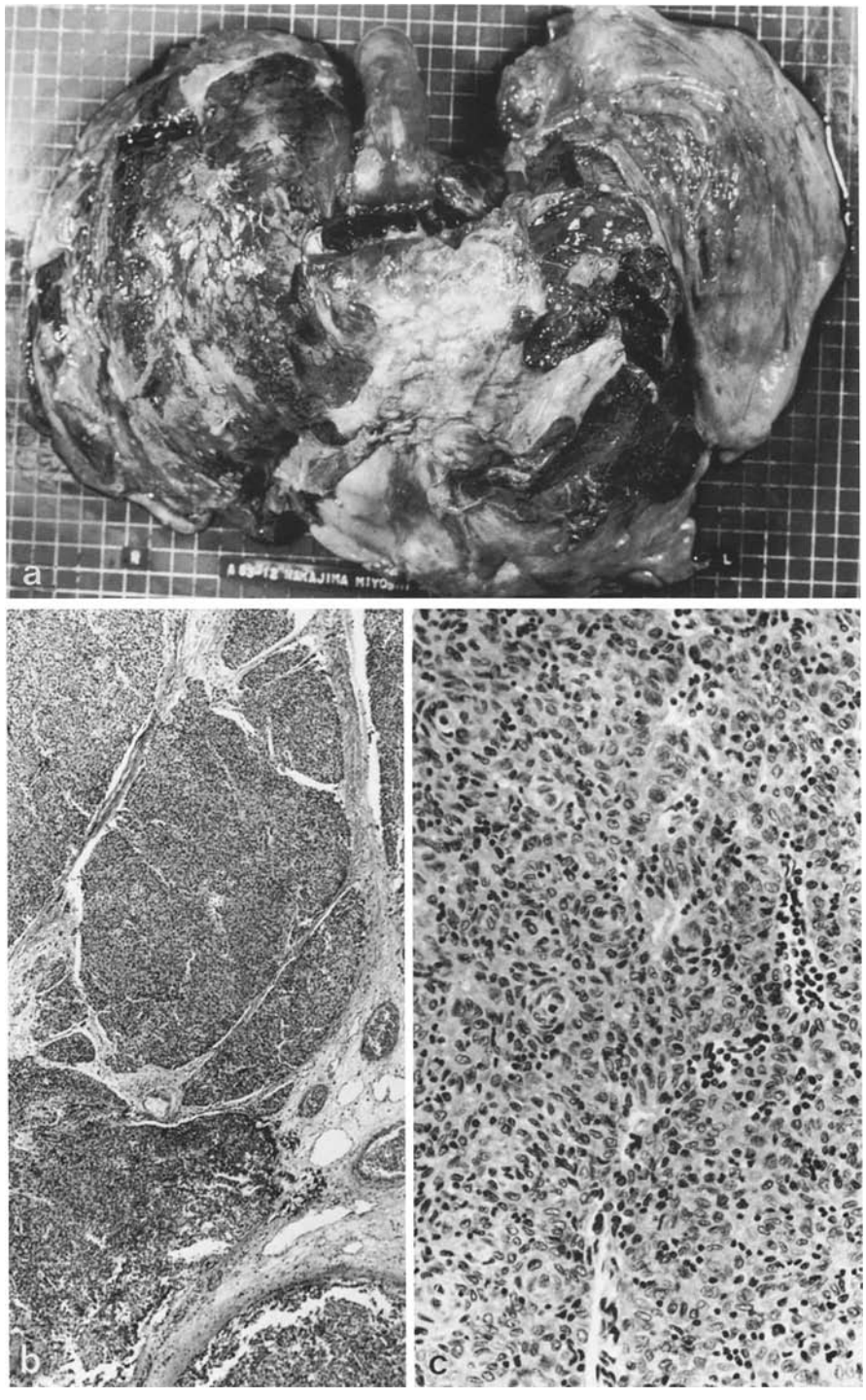

Fig. 1. (a) En bloc specimen of the thoracic organs at autopsy. An ill-defined firm tumour, occupying the anterior mediastinum, infiltrates the neighboring structures. A square on the background represents 1 × 1 cm. **(b)** Histology of the mediastinal tumour, showing a lobulated appearance. Haematoxylin-eosin × 16 **(c)** Higher magnification of **(b)**, showing typical features of thymoma composed of both epithelial and lymphocytic elements. Whorl-like arrangement of the epithelial tumour cells is noted. H-E × 80

tally obliterated by a bulky tumour with extensive myocardial infiltration (Fig. 4a). The liver showed a few metastatic deposits. Lymph node metastases were evident in the pulmonary hilum, around the aortic arch and in the paratracheal region. Apart from the tumour, several silicotic nodules, rice-grain in size, were seen scattered throughout the lung parenchyma.

The histology of the mediastinal lesion revealed a lobulated neoplasm composed of an admixture of both epithelial and lymphocyte-like cells accompanied by exuberant fibrous stroma (Fig. 1 b&c). The epithelial tumour cells showed somewhat elongated, hyperchromatic nuclei and eosinophilic cytoplasm with indistinct cytoplasmic border. Mitotic figures were scanty and cellular anaplasia was

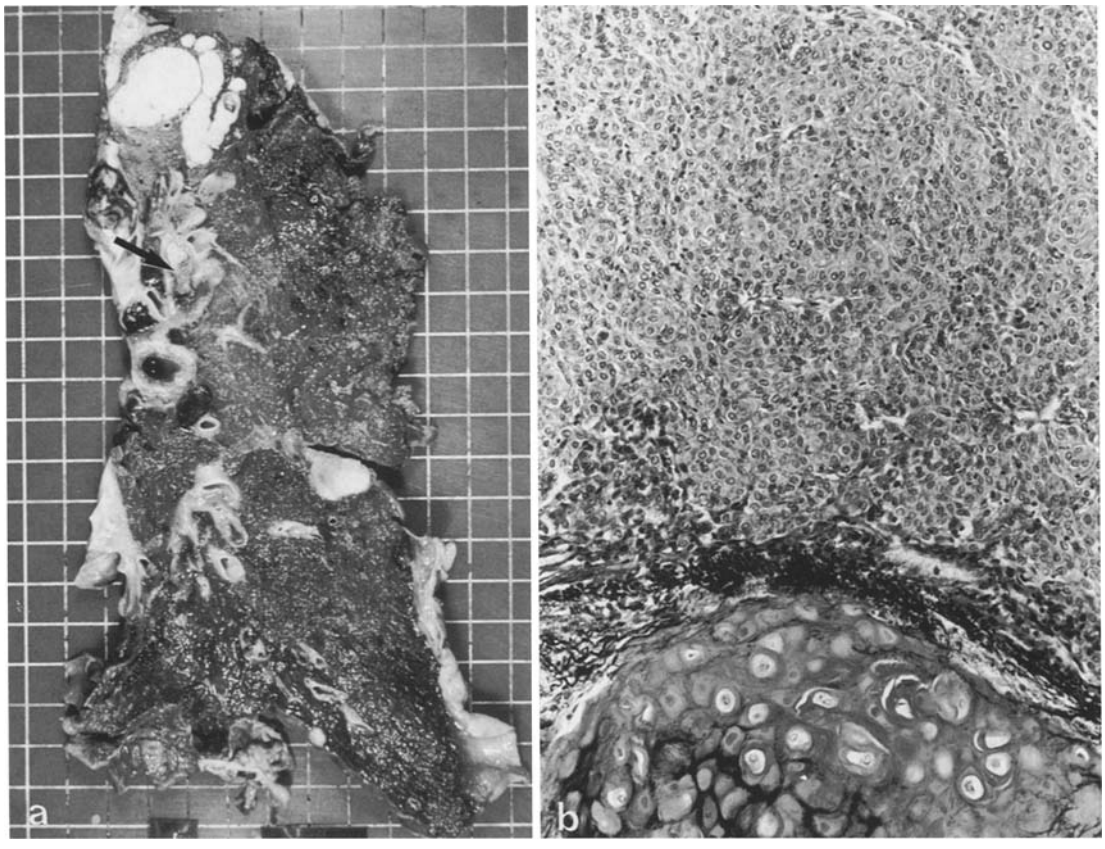

Fig. 2. Morphology of polypoid endobronchial tumours. **(a)** Cut surface of the left lung at autopsy. The upper lobe bronchus (*arrow*) and some of its branches are occluded by grayish-white, partly necrotic tumour. **(b)** Histology of **(a)**, showing a predominantly epithelial thymoma filling the bronchial lumen. Elastic-H-E ×66

absent. Keratinizing features of the tumour cells were not evident. Microcystic degeneration was frequently seen. Whorl-like structures reminiscent of Hassall's corpuscles were seen in areas composed predominantly of epithelial tumour cells.

Polypoid endobronchial tumours in the left lung showed the same histology as the mediastinal mass (Fig. 2b). The mucosal epithelium of the affected bronchi was compressed by the tumour or desquamated. Extensive infiltration of the myocardium was confirmed histologically (Fig. 4b).

Pigmented pulmonary nodules were found to be silicotic lesions composed of concentric arrangement of coarse collagenous fibers containing a small amount of doubly-refractile crystalloid particles.

Discussion

Invasive thymomas may show pleural dissemination, pulmonary infiltration, pericardial involvement or distant haematogenous metastasis in their late stages. Rarely, they may invade the bronchial tree and a few reports have documented the clinical picture of bronchial obstruction due to invasive thymoma (Garfield 1983; Fournel et al. 1985). Our report presents the first clinico-pathological description of polypoid endobronchial tumour formation from invasive thymoma. By analogy with polypoid cancers of stomach, lung, and urinary bladder, the majority of which exhibit less aggressive behavior, polypoid endobronchial tumour formation in thymoma attracts our interest. As is often the case with endobronchial metastases from extrathoracic malignancies, the bronchial lesion may mimick a primary bronchogenic neoplasm (Braman and Whitcomb 1975; Hermann et al. 1982). The recognition of endobronchial extension from invasive thymoma, therefore, is of considerable importance because of the difficulty in differential diagnosis from primary bronchogenic neoplasms.

Liver metastases from thymomas are unusual but not exceptional (Mottet 1961; Akeda and Ishii 1970; Nickel and Franssila 1976; Verley and Hollmann 1985; Denayer et al. 1986). In Lewis' analy-

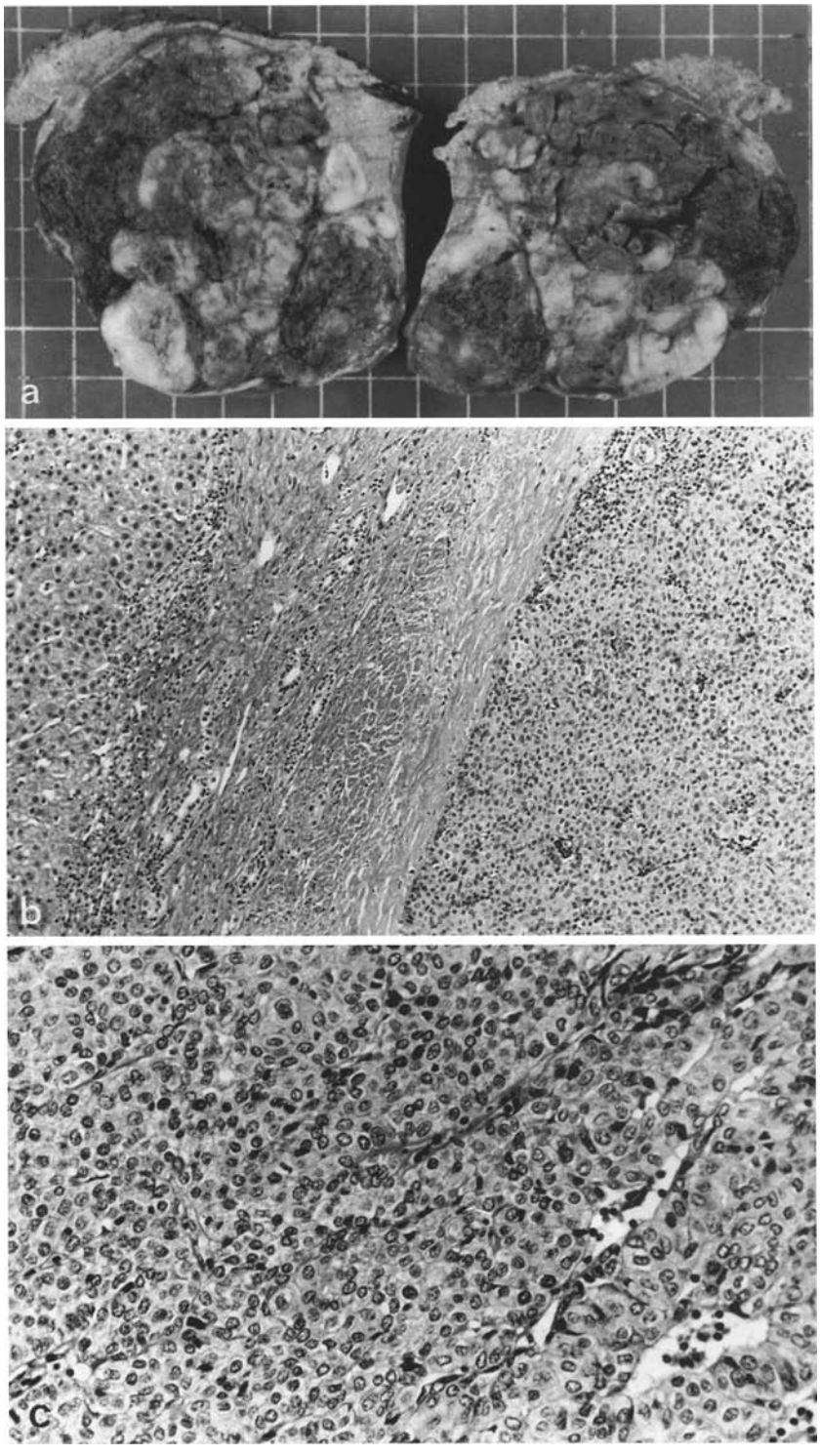

Fig. 3. Surgical specimen of the liver tumour.
(a) Well demarcated and lobulated tumour in the liver, showing medullary soft and haemorrhagic cut appearances.
(b) Histology of **(a)**, showing an encapsulated neoplasm (*right*). H-E × 33
(c) Higher magnification of **(b)**, showing sheets of bland epithelial tumour cells with slight infiltration of lymphocyte-like cells. H-E × 80

sis of 283 thymomas (1987), liver metastasis was seen in three cases (1.1%). Liver metastasis as a dominant clinical manifestation of thymoma – as in our case – seems quite rare (Masaoka et al. 1981). In order to assess the accurate incidence of metastatic diseases from thymoma, the strict histological definition of thymoma must be established with exclusion of thymic carcinoma, as stated by Lewis et al. (1987). Some reports on metastatic thymomas probably refer to thymic carci-

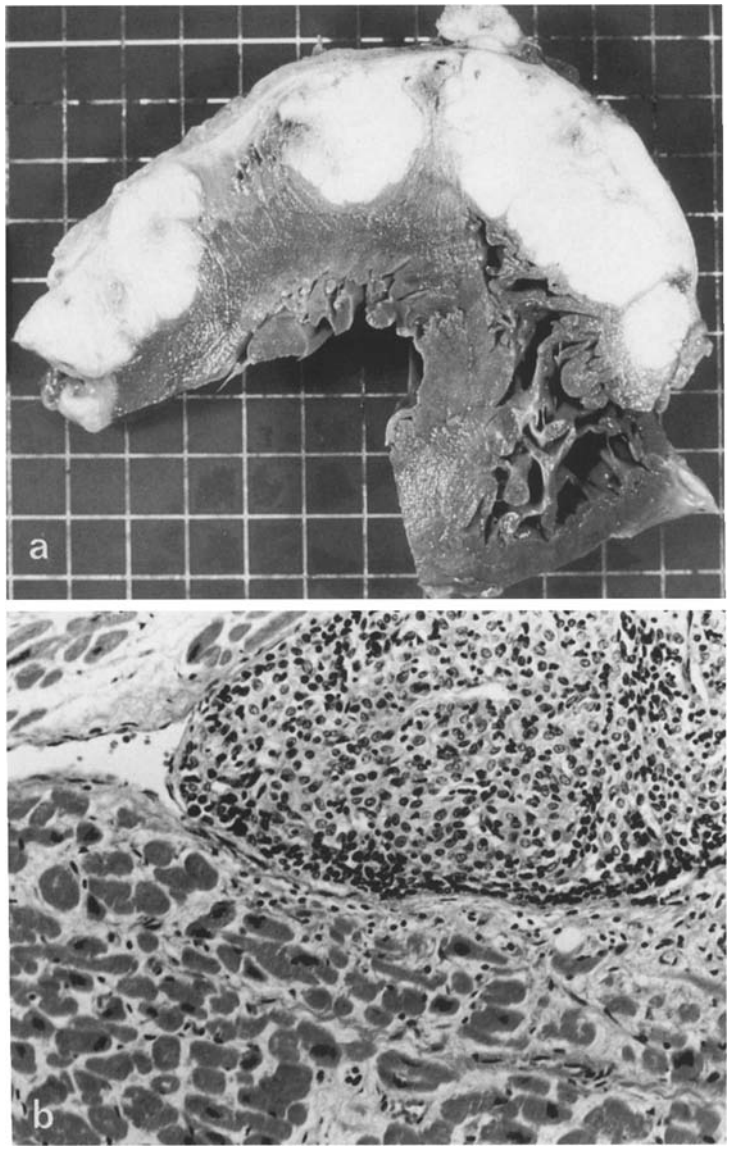

Fig. 4. (a) Transverse section of the heart, showing extensive peri- and myocardial infiltration of thymoma, particularly evident in the antero-lateral aspects.
(b) Histology of **(a)**, showing a nest of thymoma cells infiltrating the myocardium. H-E ×66

nomas (Minkowitz et al. 1968; Ketelbant-Balasse et al. 1972; Turpin et al.1984).

Massive pericardial infiltration from invasive thymoma may become symptomatic (Lattes 1962; Krakower and Cotsonas 1965; Rosai and Levine 1976). Direct myocardial involvement may be expected in cases with advanced pericardial disease, but its incidence seems rare (Krakower and Cotsonas 1965; Akeda and Ishii 1970; Marino and Müller-Hermelink 1985). Our case exhibited a so-called armoured heart with massive peri- and myocardial deposits of thymoma in all the cardiac chambers, resulting in fatal cardiac failure.

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