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CASE REPORT

Intravascular bronchioloalveolar tumour

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Intravascular bronchioloalveolar tumour. S. De-Luca, C.M. Sanguinetti, I. Bearzi, B. Murer.
ABSTRACT: A case of intravascular bronchioloalveolar tumour (IVBAT) presenting in a 49 yr old asymptomatic man is reported. IVBAT was diagnosed by open lung biopsy. The disease had a presumable duration of ten years and showed a low tendency to progress. The endothelial origin of the tumour was immunohistochemically proven.
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Intravascular bronchioloalveolar tumour (IVBAT) first described by DAIL and LIEBOW [1] in 1975 is a rare pulmonary sarcoma originating from endothelial cells. Generally this tumour shows a slowly progressing tendency to local growth and mainly affects females. Here we present a case of IVBAT that we observed in a man.

Case report

A 46 yr old asymptomatic man was admitted to our Division in June, 1987, because a chest X-ray, performed during a clinical screening for arterial hypertension, showed multiple round nodules of different size (0.5 –1.5 cm) diffusely involving both lungs. The patient was a nonsmoker and worked in a shipyard as a turner.

The clinical history was substantially negative except for two episodes of renal colic in 1982 and 1986 due to the presence of kidney stones. Since September, 1986, he had been taking methyldopa for a mild form of arterial hypertension. Clinical examination of the patient demonstrated only the presence of a pigmented nodular skin lesion on the back which on histologic examination proved to be a basal cell carcinoma. All laboratory parameters including erthyrocyte sedimentation rate (ESR), blood count, blood urea and electrolyte concentrations, liver function tests and serum immunoglobulin levels were normal. The intracutaneous PPD (5 U.T) was negative. Spirographic lung volumes and arterial blood gases were within normal limits. The chest X-ray performed after the admission to our Division confirmed the presence of multiple variously sized bilateral pulmonary nodules (fig. 1). Looking for a possible extrathoracic source of the pulmonary disease we performed abdominal echography, barium contrast study of the whole gastrointestinal tract, thyroid and testicular ultrasonography, CT scan of the brain, and bone scan which did not show abnormal findings. CT scan of the thorax excluded mediastinal lymphadenopathy. The patient underwent bronchoscopic examination (Olympus BF T20) which showed a normal appearance of the tracheobronchial tree. Transbronchial pulmonary biopsy and transbronchial aspiration with a Wang needle under fluoroscopic guidance were nondiagnostic. Thus, open lung biopsy was performed. After left thoracotomy the lung appeared to be scattered with firm nodules from 5–15 mm in diameter. The surgical specimen consisted of a pulmonary wedge containing a round nodule of 1.5 cm in diameter. The nodule was grossly circumscribed but non-incapsulated by the surrounding pulmonary parenchyma. It was uniformly pale, gray and firm.

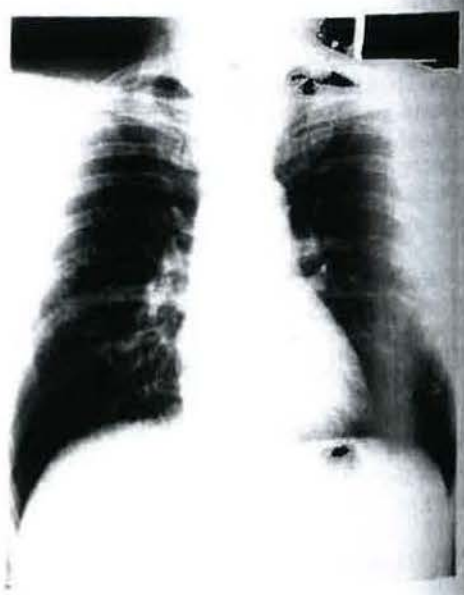

Fig. 1. – Chest roentgenogram showing multiple nodules involving both lungs.

Sections from formalin-fixed paraffin blocks were stained with haematoxylin and eosin, Van Gieson, Congo red, alcian blue at pH 2.5 and with the periodic acid-Schiff reaction. The immunohistochemical search for intermediate filaments and factor VIII using peroxidase-antiperoxidase (PAP) technique was carried out with the following antisera: factor VIII-related antigen (Ortho Diagnostics), lysozyme (Dako), alpha$_1$-antitrypsin (Ortho Diagnostics) and S-100 protein (Ortho Diagnostics); monoclonal antibodies to intermediate filament proteins: cytokeratin AE1-AE3 (Oxoid), vimentin (Boehringer Mannheim) and desmin (Dakopats).

Histologically, the tumour at the periphery consisted of monomorphic round or spindle cells with vesicular nuclei often expanding into the alveolar space in a polypoid fashion. In other adjacent areas, the tumour cells spread in small cords or clusters surrounding small hyaline nodules that were often located in the alveolar spaces, spreading through the pores of Kohn. Mitotic figures were absent. Centrally, the tumour became progressively less cellular and more fibrotic, resulting in a relatively acellular hyaline connective tissue (fig. 2). Foci of calcification and ossification were present in the centre of the tumour. At the periphery of the tumour it was possible to observe neoplastic infiltration of the vascular walls. The tumour cells were positive to factor VIII and to vimentin (fig. 3a, 3b). Immunostaining for lysozyme, alpha$_1$-antitrypsin, S-100 protein, cytokeratin AE1-AE3 and desmin was negative.

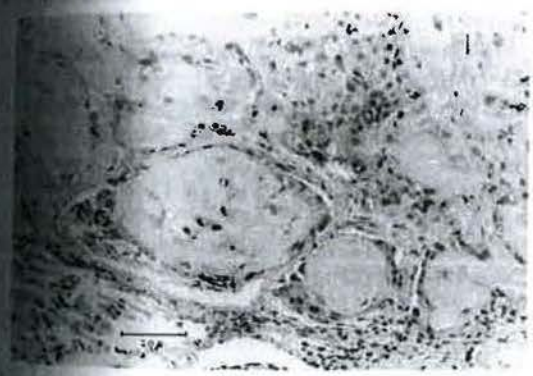

Fig. 2. – In this field the intravascular bronchioloalveolar tumour (IVBAT) shows polypoid hyaline growth which blends with an acellular zone. Plump cells, expanding into the alveolar spaces, are on the surface of the hyaline nodules. (Haematoxylin and eosin ×116).

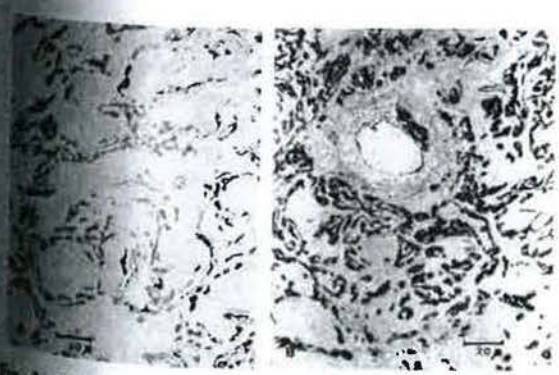

Fig. 3a-3b. – Immunoperoxidase stains demonstrate factor VIII-related antigen (a) and vimentin (b) in the tumour cells of the intravascular bronchioloalveolar tumour (IVBAT). Note the presence of the neoplastic infiltration of the vascular wall (b).

Discussion

By the end of 1987, 37 cases of IVBAT were reported in the literature and the majority of these cases occurred in females [2], only seven reports (23%) concerning male patients. Thus our finding is rather uncommon because it was observed in a young man. We do not know the reason why such a disease affects females rather than males. It is likely some unknown sex-linked factors (perhaps hormonal) may induce endothelial proliferation but no proof of this exists. The age of presentation of this disease is generally young and we confirm this aspect, probably because the origin of the pulmonary alteration in the present case dated back ten years. In fact, while requested more than once whether he had a previous chest X-ray, only after we reached the histological diagnosis did our patient remember he had a chest radiograph for occupational control ten years before. The examination of that chest X-ray already showed the presence at that time of pulmonary nodules similar to the actual ones, but of much lesser extent. This is not surprising because the disease duration in about half of the patients so far described is ten years [2]. The initial X-ray presentation of the pulmonary lesions is multiple widespread bilateral nodules (29 out of 37 cases in the summary of MIETTINEN *et al.* [2]) and in most cases, the disease is asymptomatic. In 22% of the cases metastases mainly to the liver but also to lymph nodes, bowel and retroperitoneal soft tissues, have been found. The search for possible localization of IVBAT other than in the thorax was negative in our patient and this is in keeping with the long duration of the disease and the absence of clinical symptoms. In fact, it is known that besides the vast majority of slowly progressing forms, some cases exist with a more aggressive tendency [3, 4].

The histogenesis of this rare lung tumour, which has long been debated, remains uncertain. Thus, the names proposed to define it have been modified with time. Originally, it was considered to be an epithelial tumour of the bronchioloalveolar type, tending to hyalinization and intravascular diffusion, and it was therefore called IVBAT by DAIL and LIEBOW [1]. Later, its angiogenic nature was demonstrated convincingly by ultrastructural [5] and immunohistochemical studies, leading to the following terms being proposed: sclerosing angiogenic tumour [6], sclerosing endothelial tumour [7], and multifocal epithelial haemangioendothelioma [8]. More recently MIETTINEN *et al.* [2] have suggested that the IVBAT cells are poorly differentiated mesenchymal cells, because immunotyping of the intermediate filaments revealed vimentin only in the tumour cells and never factor VIII that is always present in the endothelial cells. In our case, the tumour cells were intensively positive for factor VIII and because the vimentin is also present in endothelial cells and tumours that originate from them

[2] our results suggest the endothelial nature of the neoplastic cells of this tumour according to other authors [3–5]. Open lung biopsy appears to be essential to reach the histologic diagnosis because other less invasive procedures can only yield interlocutory results.

No therapy is generally performed in asymptomatic patients. Chemotherapy has been tried in some cases but without encouraging results. A multiple surgical approach has been used in one patient who survived 24 yrs from the diagnosis [2].

At present our patient is in good health, he does not complain of any symptoms and the roentgenographic pattern did not change in the last year so that we do not plan any treatment yet.

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RÉSUMÉ: Présentation d'un cas de tumeur bronchiolo-alvéolaire intra-vasculaire, qui s'est présentée chez un homme âgé de 49 ans, et fut asymptomatique. La tumeur a été diagnostiquée par biopsie pulmonaire chirurgicale. La maladie a duré environ dix ans et eut une progression lente. Sa nature endothéliale a été démontrée par l'examen histo-chimique.
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