Synchronous Lung Tumors

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Abstract

Synchronous lung cancer is the simultaneous presence of more than one primary foci of cancer in separate anatomical components of the lung. It is relatively rare. Here we report a case with synchronous lung cancers in the right and left upper lobes. The patient underwent staged bilateral lobectomies. Ten months following surgery a locoregional recurrence was observed in the right hemithorax.

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Introduction

Lung cancer is the most common cause of cancer deaths among men and women (1,2). In the majority of lung cancer patients, the entire respiratory epithelium is exposed to the same carcinogens (e.g. tobacco, asbestos), putting the entire respiratory epithelium at risk for carcinogenesis. Indeed this concept of a 'field change' in an epithelium has become accepted as playing a role in the development of multiple tumors in the same organ (2). Generally, multiple lung cancer is subdivided into synchronous and metachronous cancer. Synchronous is defined as two or more tumors presented or detected at the same time in different lobes or lungs. Metachronous is defined as tumors detected within a time interval (3,4).

In large cancer series, metachronous tumors are seen approximately two times more than synchronous tumors (2,5). Although the incidence of synchronous and metachronous lung cancers is unknown, their frequency were reported as 0.26%-14.5% (1-6,9).

Case Report

A 49-year-old man was admitted to our clinic with loss of weight, chest pain and night sweats. Chest X-ray showed a left hilar nodular lesion and a right apical infiltrate (Figure 1). Chest computed tomography (CT) showed a consolidation area on the left upper side (Figure 2), a solid apical lesion on the right side (Figure 3) and a subcarinal lymphadenopathy. In sputum cytology, atypical squamous cells were seen. In fiberoptic broncoscopy a white abnormal mucosal lesion was observed at the left upper lobe orifice, which proved to be squamous metaplasia and focal *in*

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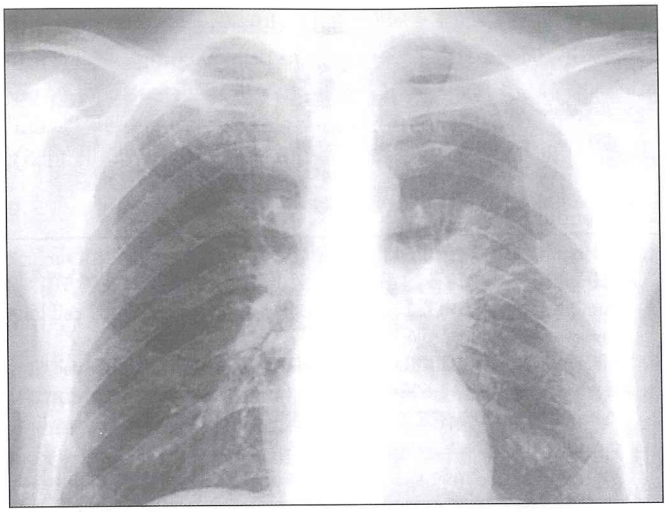

Figure 1. *Chest X-ray: A left hilar nodular lesion and a right apical infiltrate.*

situ squamous cell carcinoma following biopsy. Transthoracic needle biopsy specimen of the right upper lobe lesion revealed a diagnosis of pleomorphic undifferentiated malignant epithelial tumor. Metastatic screening were negative for brain (MRI), abdomen (ultrasonography) and bone (sinthigraphy).

His past medical history included lumbar hernia operation in 1989. He had been smoking 2 packs of cigarettes and drinking heavily for 35 years. His physical examination was unremarkable. Results of laboratory studies were in normal ranges. Pulmonary function tests revealed a forced vital capacity (FVC) of 4.73 (106%) and forced expiratory volume (FEV_1) of 3.82 (105%).

Intraoperatively, rigid bronchoscopy revealed the tumor at the left upper lobe orifice, right side was normal. Mediastinoscopy was performed. Biopsies of lymph node stations 4R, 4L, 7 were negative for tumor metastasis at frozen section analysis. A left posterolateral thoracotomy was performed. The mass lesion was palpated near the left upper lobe bronchus. Left upper lobectomy was performed with the excision of lymph nodes no; 5, 6, 9, 10.

Pathologic analysis revealed a T1N0M0, (2x2x1cm) squamous cell carcinoma.

Postoperative course was uneventful. Right thoracotomy was performed 17 days after the first operation. During the operation the mass lesion was palpated on the right upper lobe adherent to the parietal pleura and en-bloc right upper lobectomy was performed with excision of no; 7, 9, 10, 11 lymph nodes. The pathologic analysis revealed a T3N0M0 (2.5x2.5x1.5 cm), adenosquoamous cell carcinoma with invasion of endothoracic fascia and both layers of the pleura. The margins were negative for tumor. Ten months after the operation a locoregional recurrence was observed in the right hemithorax. Biopsy was not performed since it was thought that this recurrence was due to the formal tumor. The patient is currently receiving chemotherapy (Paclitaxel + Carboplatin).

Discussion

The simultaneous discovery of two pulmonary nodules raises the clinical dilemma of whether these lesions represent metastases or primary synchronous lung cancers. Differentiation of these clinical entities is important in determining the extent of surgical resection (6).

According to the most recent AJCC Cancer Staging Handbook (1997) (7), multiple synchronous tumors of different histological cell types should be considered separate primary lung cancers and each should be staged separately (6), and for the tumors having advanced stages than II surgery should not be performed (3,5,6). If there is metastasis, the case is accepted as stage IV and surgical treatment is rarely indicated (1,5). Ichinose and his colleagues (1,8) have shown that DNA flowcytometry can be used to differentiate between two synchronous cancers of the same histologic condition by analysis of the DNA ploidy of the two tumors. This may help to distinguish more accurately the two situations and their

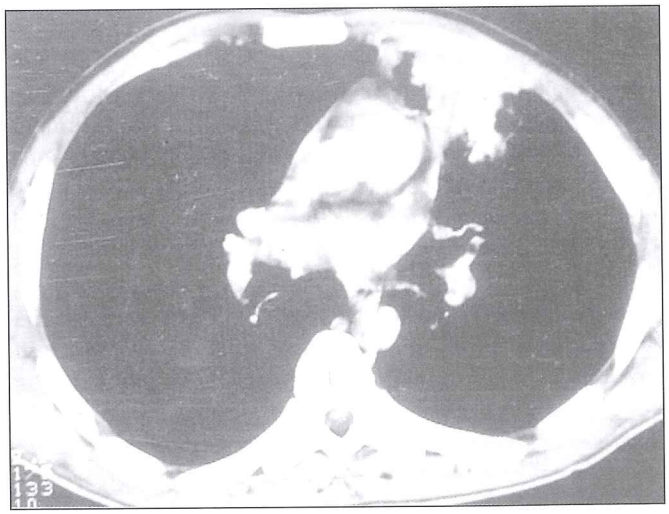

Figure 2. *Thorax CT: A consolidation area on the left upper side.*

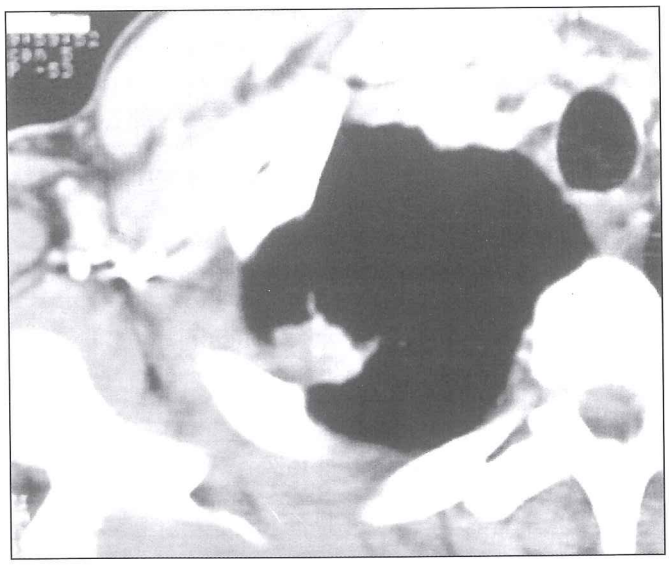

Figure 3. *Thorax CT: A solid apical lesion on the right side.*

corresponding survival patterns in the future (6).

The most recent and recognised criteria for differentiation between multiple primary lung cancers and recurrences were outlined by Martini and later modified by Antaklı (3,4).

The diagnosis is commonly made by chest X-rays and CT. Some findings are identical at bronchoscopy or at surgery and others are less commonly found by pathologists during examination of resected specimens. In a large number of cases the diagnosis is never made but discovered at autopsy as shown by the authors (1,3,6,9).

Survival in patients with synchronous lung tumors has a wide range in different series. 5-year survival was 6% in Carey's study (10), including patients with small cell carcinomas, 38% in Pommier's (2), 33% in Vansteenkiste's (6), 19% in Van Rens' (5), 15.7% in Deschamps' (11), and 23% in Martini's studies (3).

It is clear that the patient with a malignant lesion, be it considered as a second primary, has doubled the risk of dying compared to that with a simple isolated lung cancer (5,6).

In lower grade synchronous tumors, especially in squamous cell carcinomas, early surgical treatment may provide survival rates as long as solitary lung cancer cases (12,13). Vansteenkiste (6), found that agressive surgical approach for two lesions can be performed with an acceptable mortality rate and offers a possibility for long term survival both in patients with two lesions in the same lobe, in different ipsilaterally lobes, or in different lungs. In bilateral cases wedge resection and segmentectomy were preferred, while in ipsilateral lung tumors agressive surgery such as bilobectomy or pneumonectomy was performed in many series (1-3,6). In Vansteenkiste's study (6) an obvious negative influence on survival was not found when limited resection procedures were performed. This is also reported by Pommier (2).

Multiple synchronous tumors of different histological cell types should be considered separate primary lung cancers and each should be staged separately. In surgical treatment of patients with bilateral synchronous cancers, staged bilateral thoracotomies at an interval obtain satisfactory results (1,6).

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