

# Bronchopulmonary carcinosarcoma

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**Diaconită, G. (1975).** *Thorax*, 30, 682–686. **Bronchopulmonary carcinosarcoma.** Carcinosarcoma accounted for 0.27% of nearly 3000 lung cancers examined in this department. All the patients were men aged between 44 and 62 years, and a majority of the tumours occurred in the left lung. Three patients died within six months of lung resection and in each case a postmortem examination was performed. In seven the carcinomatous component was a squamous-celled growth, and in one columnar-celled; the histology of the sarcomatous element varied. Carcinosarcomas form a distinct group of malignant lung tumours. In five cases sarcomatous transformation of the stroma had occurred and was considered to be the usual means by which the mixed type of growth arises. The other three were considered to be 'collision' tumours. Carcinomatous metastases without sarcomatous change were seen in lymph nodes in three cases, and in the three fatal cases sarcomatous tumour had recurred.

Carcinosarcoma of the lung is a rare but distinct tumour entity and usually results from malignant change in the stroma of a carcinoma, but occasionally it is caused by the collision of two separately arising neoplasms. Kakos *et al.* (1971) reviewed 44 published examples. The WHO classification of mixed lung tumours includes carcinosarcomas of embryonic type (pulmonary blastomas), the distinctive features of which are the presence of stromal and epithelial components resembling those in embryonic lung.

This paper presents the clinical and pathological features seen in eight carcinosarcomas which were removed surgically; two of the cases have been described previously (Eskenasy, 1958; Diacanita and Săvuleanu, 1966).

## CLINICAL FEATURES

All eight patients were men with an average age of 53 years. The principal clinical signs and symptoms included chest pain, frequent haemoptyses, cough with mucopurulent sputum, slight pyrexia, and weight loss. In two cases (2 and 8) an influenza-like illness was the presenting symptom but in most cases the clinical features were the result of an obstructive pneumonitis. Chest radiographs showed round or oval opacities located in the parahilar region in four, in the lower lobe of the left lung in two, in the upper lobe of the right lung in one, and in the centre of the lower lobe of the right lung in the remaining case. Broncho-

scopy was carried out in six patients and showed an endobronchial tumour which in one case extended into and obstructed the left main bronchus. Bronchoscopic biopsy was taken in four and was positive in one, but bronchial aspirates uniformly failed to show any malignant cells. In five patients a pneumonectomy was done and in three a lobectomy was performed. Three patients died within six months of operation.

## PATHOLOGICAL FEATURES

**MACROSCOPIC** The endobronchial tumours were located in the main left bronchus or where the lobar bronchi divided into segmental bronchi and they totally or partially blocked the bronchial lumen (Fig. 1). All the tumours were polypoid and at their attachment had infiltrated through the bronchial wall. On section oval-shaped tumour masses with numerous projecting surface nodules had spread into the lung substance but were sharply demarcated from it. The largest tumour measured 10×7 cm; the cut surface of some showed extensive areas of haemorrhage and necrosis (Fig. 2). In six cases bronchiectasis was present in the lung distal to the tumour.

In the three patients who died, one showed a local recurrence of growth around the bronchial stump together with invasion of the chest wall, parietal pericardium, and diaphragm and there was involvement of the hilar lymph nodes. In the second patient metastases were found in the

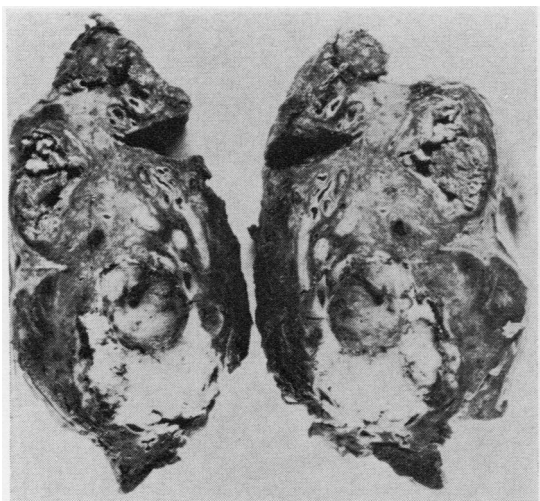


FIG. 1. Tumour mass at the bifurcation of left main stem bronchus with bronchial obstruction and extra-bronchial extension (case 8).

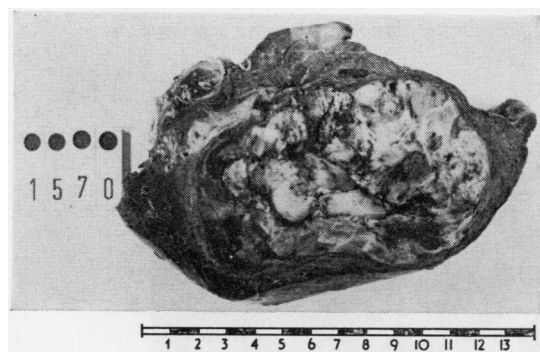


FIG. 2. Tumour mass, 10×7 cm, in left lower lobe with necrosis (case 2).

adrenals, and in the third case the pleura, pericardium, diaphragm, and opposite lung were involved.

**MICROSCOPICAL** In seven cases there was squamous-celled carcinoma and in the remaining case a columnar-celled carcinoma. In three of the tumours the sarcomatous element was a fibrosarcoma, in three an undifferentiated polymorphic-celled sarcoma, and in the remaining two there was a variable amount of fibre content (Figs 3 and 4). In five of the tumours malignant transformation of the stroma could be traced, and

in the other three the two separate malignant components intermingled and the tumours were considered to be collision tumours (Fig. 5). In three cases the hilar lymph nodes contained only secondary carcinoma and in the three patients who died both the locally recurrent growth and that in distant organs were sarcomatous in type.

#### DISCUSSION

The term carcinosarcoma implies the coexistence of carcinomatous and sarcomatous tissues in the same tumour due to simultaneous change in both epithelial and connective tissues. According to Chaudhuri (1971), such a tumour should be able to produce metastases of each type of growth independent of the other. This would seem to be possible only if the two types of tumour had arisen independently one of the other and had grown into each other (collision tumour). In a true collision tumour, the parts of the neoplasm other than where the two tumours fuse are either almost pure carcinoma or pure sarcoma. In the present series three of the neoplasms, like the tumour described by Peltz (1962), showed microscopical intermingling of the two components only in the collision region. These cases, however, have been included as they had been regarded as a form of carcinosarcoma in previous reports. The reported incidence of metastases has varied. In the case reported by Chaudhuri the lymph node metastases were carcinomatous but the subcutaneous ones were sarcomatous.

Willis (1960) considered a carcinosarcoma as an epithelial neoplasm with sarcomatous transformation of the stroma, a view which is now generally accepted and which appears to be confirmed by five cases in the present series.

In the present series metastatic carcinomatous growth was present in the hilar lymph nodes in three of the cases, but the local recurrent growth was sarcomatous in type. In one case a sarcomatous metastasis was found in the adrenal, unlike the previous findings of Stackhouse, Harrison, and Ellis (1969). Both Barson, Jones, and Lodge (1968) and Stackhouse *et al.*, found that metastatic growth in their cases was of a mixed type but predominantly sarcomatous.

Carcinosarcoma cannot be differentiated preoperatively from other malignant tumours of the lung and the diagnosis is established only by histological examination. Preoperative confirmation of the malignant nature of the tumour is sometimes difficult and may require more than one bronchoscopic biopsy. The sarcomatous areas may not be uniformly distributed throughout the tumour as

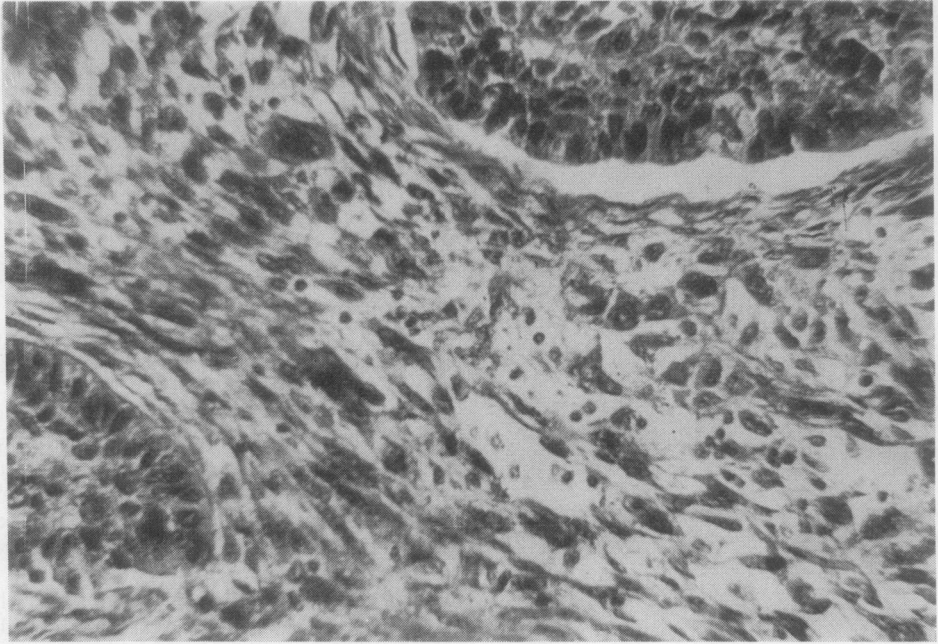


FIG. 3. Areas of squamous-celled carcinoma and fibroblastic sarcoma, showing sarcomatous transformation of stroma (case 8)  $\times 200$ .

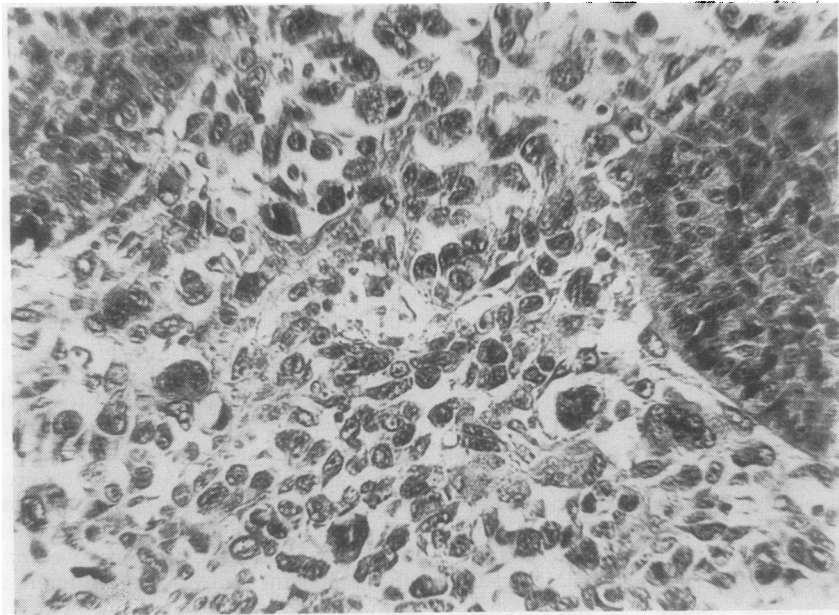


FIG. 4. Areas of squamous-celled carcinoma and polymorphic type sarcoma due to sarcomatous transformation of stroma (case 5)  $\times 200$ .

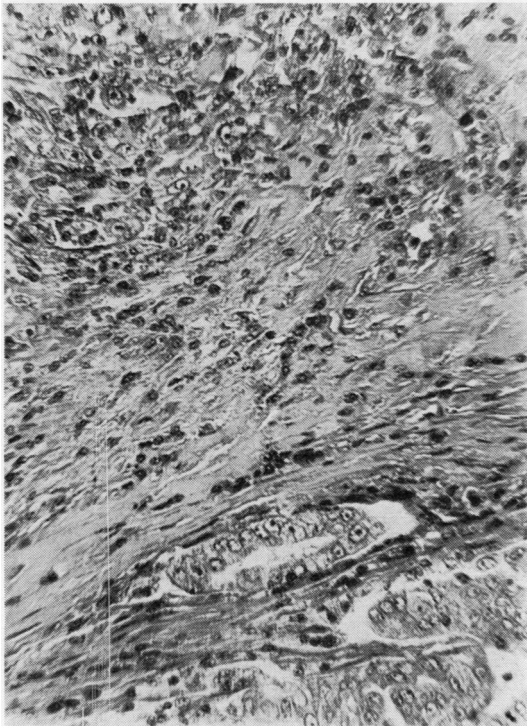


FIG. 5. Region of fusion of a cuboidal-celled adenocarcinoma and sarcoma. A collision-type of carcinosarcoma (case 4)  $\times 175$ .

in five of the present cases, but Weaver, Branfoot, and Hargrove (1971) and Drury and Stirland (1959) have emphasized the importance of complete intermingling of carcinoma and sarcoma cells if the tumour is to be regarded as a true carcinosarcoma. In none of the present cases was cytological or biopsy examination successful in establishing the true histological nature of the tumour; it showed only that it was a malignant neoplasm.

In five of the present series sarcomatous transformation of the stroma in a carcinoma could be traced and accounted for the mixed nature of the tumour. The sarcomatous tissue presented a varied histological appearance; in some places the carcinomatous tissue was surrounded by very anaplastic and degenerate sarcomatous stroma while in others the stroma as yet showed no features of malignancy. The carcinoma in all five was of the squamous-celled type, as in the cases reported by Davis *et al.* (1972), and there was no evidence that malignant epithelial changes had

been induced by a primary underlying sarcoma; it appeared to be rather the reverse process.

Among the theories of origin of the non-collision-type of carcinosarcoma is the suggestion that they may be derived from mutation of carcinoma cells into malignant connective tissue cells. Abricosov (1947) considered that during 'blastomatous' development epithelial cells might differentiate into cells of mesenchymal type, that is, connective tissue metaplasia of epithelial cells. Craciun and Niculescu (1953), however, considered that two independent neoplastic processes occurred in the same organ.

Three cases in the present series are regarded as collision tumours in which a focus of an independent sarcoma is considered to have extended into a separate carcinoma with a zone where the two intermingled. The more rapid growth of the sarcoma resulted in sarcomatous metastases, and this is considered also to support the independent nature of the two tumours.

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