

## Carcinosarcoma of the lung : A case report.

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Yenrudi S, Haetanurak S. Carcinosarcoma of the lung : A case report. Chula Med J 1987 Apr ; 31 (4) : 329-334

*Carcinosarcoma of the lung in a 66-year-old women is reported. Previously she had a clinical diagnosis of hemolytic anemia. Laboratory investigations were those of systemic lupus erythematosus. On admission she presented with respiratory symptoms and roentgenographic evidence of a mass in the right lower lobe. The excised mass consisted of mixed squamous cell carcinoma and pleomorphic sarcoma with histiocytic component. By morphological evidence, either a neoplastic occurrence of both components simultaneously, or a prior carcinoma with sarcomatous changes partly from histiocytes is speculated.*

เสาวณีย์ เบ็นฤดี, สุรเชษฐ์ เหตานุรักษ์. คาร์ซิโนซาร์โคมาของปอด. จุฬาลงกรณ์เวชสาร 2530 เมษายน; 31 (4) : 329-334

รายงานผู้ป่วยด้วยคาร์ซิโนซาร์โคมา เป็นหญิงไทยอายุ 66 ปี มีอาการโลหิตจาง ชนิดเม็ดเลือดแดง ถูกทำลายมาก่อน ผลการตรวจทางห้องปฏิบัติการ สาเหตุมาจากโรคซิสเทมิกลูปัส อิริทีมาโทซัส ครั้งนี้ผู้ป่วย มาด้วยอาการผิดปกติทางระบบหายใจ และตรวจพบก้อนที่กลีบล่างของปอดขวาจากการตรวจภาพรังสี ลักษณะของมะเร็งทางกล้องจุลทรรศน์ มีทั้งส่วนที่เป็นคาร์ซิโนมาของเซลล์ชนิดเดียวกับเซลล์บุผิวหนังและซาร์โคมาอีก ส่วนหนึ่งที่มีกำเนิดจากออสทีโอซัยท์ พยาธิกำเนิดในมะเร็งของผู้ป่วยรายนี้ อาจเกิดเป็นมะเร็งทั้งสองส่วนพร้อมกัน หรือคาร์ซิโนมาเกิดก่อนแล้วกระตุ้นให้เกิดซาร์โคมาในลำดับต่อมา

Carcinosarcoma of the lung is a very rare malignancy composed of malignant epithelial and mesenchymal tissues. Because of its rarity, the exact incidence is not known. However, this tumor is found more often in men than in women.<sup>(1)</sup> Up to 1979, only 33 cases of the tumor have been reported.<sup>(2)</sup> There was a wide variation in the survival period after operation. The mortality rate was high in the operable cases because of widespread metastases. We present a case of Carcinosarcoma of the lung occurring in a 66-year-old woman with a detailed clinical and pathological study.

### Case Report

A 66 year old Thai woman came to the Department of Medicine, Chulalongkorn Hospital, for her fourth admission on 8<sup>th</sup> December 1983. She presented with a low grade fever, cough, and anorexia for one month prior to admission together with a 3 kg weight loss.

She had first been admitted from 17 to 20 August 1980, with signs and symptoms of bleeding tendency. The investigation had shown low platelet count, and positive direct Coomb's test; ANF was positive 1 : 640 and LE preparation was negative. Megakaryocyte in the marrow tissue was normal. Combined treatment with endoxan and prednisolone was recommended as well as a follow up scheme. The second admission was from 25 September to 13 October 1980. Inflammatory lesion in the upper lobe of the left lung was suspected, based on roentgenographic examination. The third admission was from 14 to 28 October 1981. She presented with fever, chill and cough. Roentgenogram of the chest showed persistent infiltration in the left upper lobe. Urine culture yielded growth of *E.coli*. Antituberculous drugs, antibiotics for the urinary tract infection as well as endoxan and prednisolone were recommended. About 2 months prior to the fourth admission, all drugs were discontinued.

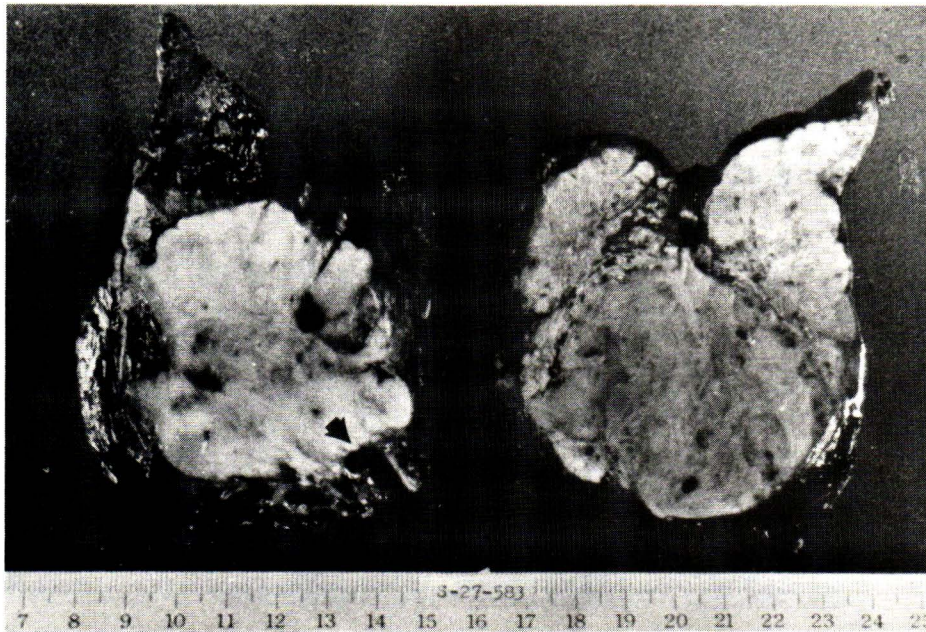
Physical examination on the 4<sup>th</sup> admission showed decreased breath sound of both lungs with mild hepatosplenomegaly. Laboratory investigation disclosed a hematocrit of 32 volume percent, a reticulocyte count of 3 percent and a white blood cell count of 19,100 cells/mm.<sup>3</sup> with 91 percent segmented neutrophils, 4 percent lymphocytes, 4 percent monocytes and 1 percent basophils. The platelets count was 156,000/mm.<sup>3</sup> Urinalysis disclosed

a trace of albumin, and a few white blood cells and granular casts per high power microscopic field. Blood chemistry revealed 2.3 gm./100 ml of albumin, 4.8 gm./100 ml. of globulin, and 17.7 mEq/L of bicarbonate ; the rest as well as LFT were within normal limit. chest roentgenogram exhibited a mass of 5 by 6 cm occupying the right lower lobe with increased infiltration around the mass on subsequent examination. Prednisolone and antibiotics covering both Gram positive and Gram negative bacteria as well as symptomatic treatment were recommended. In spite of these treatments, fever with chill developed. Hence, urine culture after cessation of antibiotics was performed which yielded a growing of klebsiella species. The patient improved after treatment with specific antibiotics for the organism. Because of the detectable mass in the right lung, three subsequent cytological sputum examinations were performed. Two out of three examinations were positive for malignant cells. The lesion was found in the right lower lobe involving adjacent posterior chest wall during operation, leading to resection of the middle and lower lobes. The patient recovered uneventfully and was discharged 13 days later. Follow up study of the patient 2 months after operation did not disclose any evidence of metastasis.

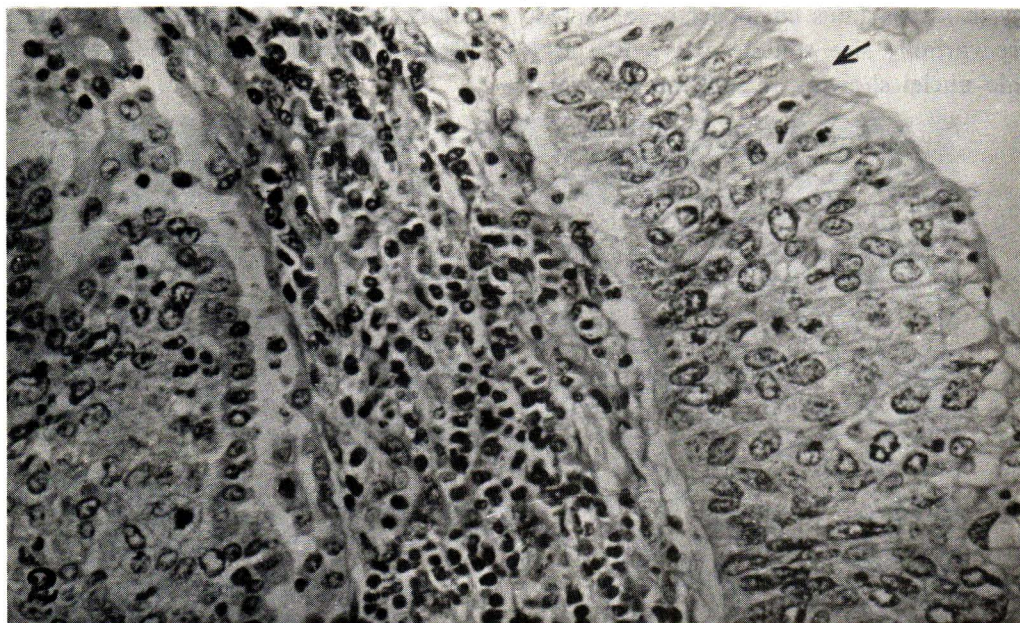
### Pathological findings

The middle and lower lobes of the right lung weighed together 450 gm. Bulging surface with grey-yellow discoloration was noted over the pleural surface of the lower lobe. There was circumscribed, greyish-white and round mass, 5 cm in diameter, in the lower lobe (Fig 1). The mass encircled the stump of the lower lobe bronchus. It was surrounded by greyish-white zone of consolidation which extended to the pleural surface.

Microscopic examination of the tumor exhibited pleomorphic spindle cell, and foci of epithelial cells forming solid nests were occasionally observed among those cells. In carcinomatous areas, there was evidence of transition from benign ciliated columnar epithelium (Fig. 2), to large cells with pale acidophilic cytoplasm, distinct cell membrane showing differentiation toward squamous cells. Meticulous study disclosed transitional zone evolving into both spindle cells and epithelial cells (Fig. 3).

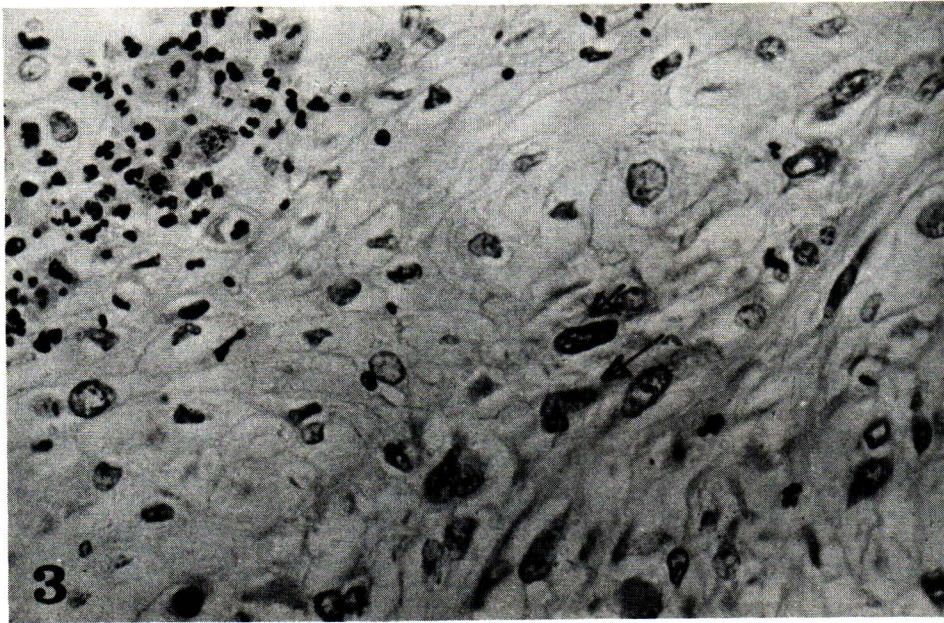


**Figure 1.** An illustration showing the cut surfaces of the mass at different levels. Left, an irregular circumscribed grayish white mass just distal to lobar bronchus, arrowhead. Right, the periphery of the lung around mass has undergone grayish pneumonic like consolidation.



**Figure 2.** The carcinomatous component disclosing transition from ciliated columnar epithelium, arrow. H & EX 400

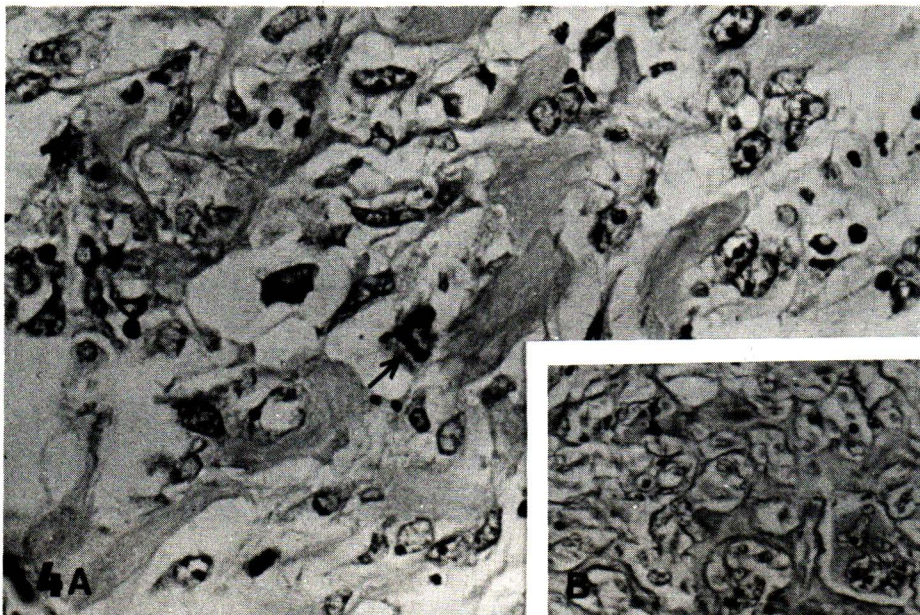




**Figure 3.** The basal layer of squamous epithelium showing feature evolving into spindle cell and squamous cell, arrow. H & EX 400

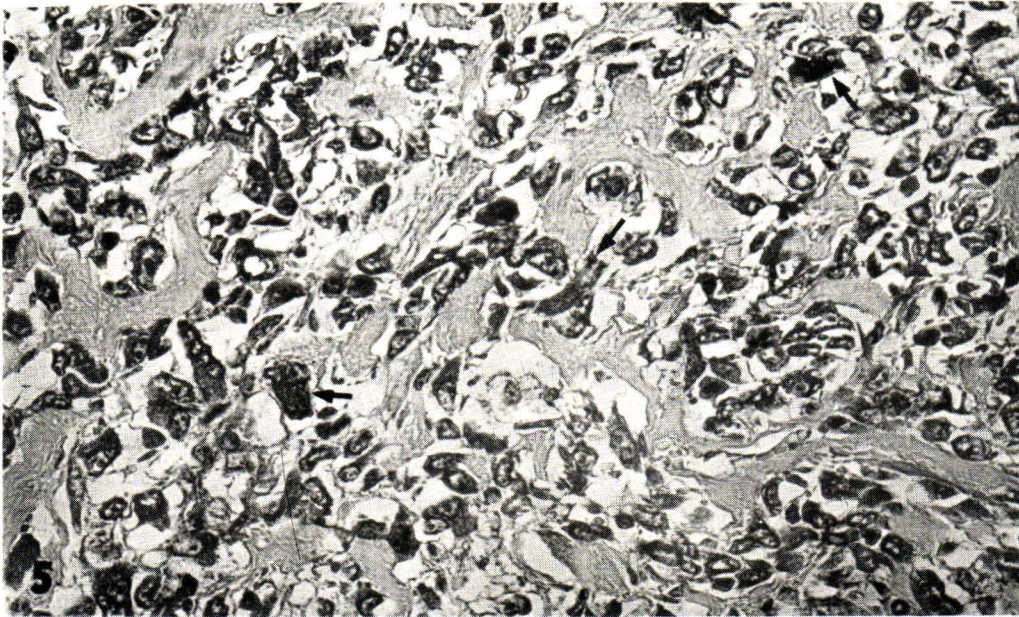
The histopathology of pneumonia like consolidation around the mass showed irregular solid sheets of carcinoma in the alveolar space. There were mixed inflammatory cells, isolated malignant squamous cells and necrotic tissue located centrally in the sheets of carcinoma. Additional tumor emboli were infrequently observed. A variety of cellular morphology in sarcomatous components was noted. These were variable size spindle cells with large pleomorphic nuclei showing infrequent abnormal

mitosis (Fig. 4 A). Some were multinucleated with ill-defined cytoplasmic membrane but most produced reticulin fibers and dense collagenous fibers (Fig. 4 B). Plump spindle cells with acidophilic cytoplasm were infrequently observed. Immunoperoxidase study showed weakly positive keratin in the large carcinomatous cells and prominently positive for lysozyme and alpha 1 antitrypsin in the cytoplasm of pleomorphic spindle cells (Fig. 5).



**Figure 4. A, B** Sarcomatous component of the mass consists of pleomorphic spindle cell with abnormal mitosis, arrow and 4 B, numerous reticulin fibers production, H & EX 400





**Figure 5.** Immunoperoxidase study for histiocytic marker is strongly positive, arrow (alpha-1 antitrypsin) X 400

## Discussion

Based on histological appearance, transformation of malignant squamous cells from the cellular lining of the bronchus supported the pathogenesis of squamous cell carcinoma as generally documented.<sup>(2)</sup> Concomitant sarcomatous transformation from carcinoma is considered significant in two aspects. Firstly, it is a true sarcomatous change induced by the initial carcinoma. Simultaneous occurrence of carcinomatous and sarcomatous components from multipotential mother tissue as stated by Virchow is the second opinion. This is supported by the fact that some kind of embryonal tissue having the capacity to form on organ, in which both epithelial and mesenchymal tissues exists, as well as tissue culture confirming carcinosarcoma of the uterus.<sup>(3)</sup> Sarcomatous transformation of the scaffolding cells of carcinoma is another postulation. The evidence put into consideration for this is that the tissue culture in vitro of mammary carcinoma has been shown to induce sarcomatous transformation of the stroma.<sup>(4)</sup> The possibility of collision tumors is also suspected. However, all reported cases failed to demonstrate two primary lesions. Malignant changes upon hamartoma are also considered.<sup>(5)</sup> However, yearly roentgenogram of the chest without any mass in the tumor area in this case is against such speculation. Some

workers regarded pulmonary blastoma as a variant of the carcinosarcoma,<sup>(6)</sup> but histologically pulmonary blastoma is composed of immature epithelial and mesenchymal tissues reminiscent of the embryonal lung tissue.<sup>(2)</sup> Carcinosarcoma from another point of view is considered to be carcinoma with spindle cell metaplasia simulating sarcoma, a pseudosarcomatous appearance of the stromal connective tissue.<sup>(7)</sup> Histologically in this case, inspite of no metastatic sarcoma, abnormal mitotic figures with plemorphic spindle cells showing large irregular hyperchromatic nuclei, support the consideration for it being a true sarcoma.<sup>(8)</sup> The remaining problem is that both tissue components are simultaneously derived from the mother tissue, or is it a previous carcinoma stimulating sarcomatous changes on the stromal connective tissue and histiocytes.

Based on immunoperoxidase study, the sarcomatous component is partly histiocytic in origin. Any neoplastic lesion usually provokes the monocyte-phagocyte system as a natural immunologic consequence. Hence, the possibility of carcinogen stimulating the surface epithelium first then overloading the monocyte-phagocytic cell with subsequent developed malignant histiocyte is speculated.

Tissue culture might be useful in the clarification of the tissue's origin as well as the ultrastruc-

ture of the sarcoma. As mentioned earlier the carcinosarcoma of the lung is rare. Therefore, it is difficult to elicit the exact incidence for this tumor. However from reported cases in the literature, there were twice as many males as females with age ranging from 35 to 81 years. The highest frequency is in the fifth decade.<sup>(1)</sup> The major signs and symptoms are cough, hemoptysis, recent pulmonary infection and chest pain. Few cases are noted on routine roentgenographic study of the chest.<sup>(6)</sup> According to Moor, the tumor is grossly divided into two types, endobronchial and invasive.<sup>(9)</sup> The latter has the worst prognosis and is less common than the first one.<sup>(6,10)</sup> The main histological features are combined squamous cell

carcinoma and fibrosarcoma.<sup>(6, 10-12)</sup> The variants of cellular elements are adenocarcinoma, undifferentiated carcinoma, spindle sarcoma, pleomorphic sarcoma, chondrosarcoma and osteogenic sarcoma.<sup>(10-13)</sup> Most of the surviving patients have undergone either lobectomy or pneumonectomy. The postoperative survival period ranged from 3 months to 6 years.<sup>(1,6,11)</sup>

### Acknowledgement

The authors wish to thank Professor Samruay Shuangshoti for kindly reviewing the manuscript and Associate Professor Boonchuay Vatanatumrak for his permission to publish this report.

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