

TITLE	PRIMARY SMALL CELL CARCINOMA OF THE PLEURAE (A CASE REPORT AND THE MORPHOMETRIC STUDY)
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KEYWORDS	Small cell carcinoma, pleura, nuclear diameter
DIAGNOSIS	Pleural small cell carcinoma
SUMMARY	The authors report a case (the second in the literature) of the primary pleural small cell carcinoma [pSCC]. The clinical and radiological presentation of the tumour was very suggestive of malignant mesothelioma. The comparative morphometric studies of the nuclear diameters in the cell population of pSCC and 3 resected lung small cell carcinoma [ISCC] showed that the former was composed of the higher number of larger cells than the latter one. The average nuclear diameter of pSCC was $9,4 \pm 1,2 \mu\text{m}$ and for ISCC was $8,54 \pm 0,98 \mu\text{m}$. The 25 th and 75 th percentiles of pSCC were 8,74 and 10,15 but for ISCC were 7,7 and 9,2, respectively.
CASE REPORT	<p>A 65-year-old man, with a history of cigarette smoking (2 packs per day for 40 year), a car mechanic. He was admitted to the hospital because of his complaining about weakness, exercise dyspnea, cough with mucous sputum - since 6 months; the weight lost (10 kg during 3 months).</p> <p>Physical examination revealed a normal temperature (36,6°C), heart rate of 108 /min, respiration rate of 20/min and blood pressure of 105/80 mmHg. Examination of the chest showed no movement of the ribs during respiration on the right side of thorax; a dull sound on percussion, no vesicular breath sounds nor vocal resonance over almost whole right lung.</p> <p>A postero-anterior chest X-ray showed, unilateral diffuse pleural effusion obscuring the lung parenchyma up to the right scapular angel. (Fig. 1) Contrast enhanced CT scans confirmed enormous pleural effusion causing a partial compression of the right lung. The massive, nodular (garland-like) thickening of the parietal pleura with some extension into the visceral pleura was seen, but without any parenchymal abnormalities in the whole right lung. The subcarinal lymph nodes were enlarged up to 2,5 cm. (Fig. 2) The picture was very suggestive of malignant pleural mesothelioma.</p> <p>Twice pleural cavity puncture yielded 500 ml and 750 ml of sanguineous fluid. Fiberotic bronchoscopy showed no endobronchial lesions. A bronchial washings and brushings were negative for malignant cells, acid-fast bacilli, and bacteria. During a thoracoscopy procedure, the white-yellow nodules were seen along the parietal pleura. No extension beyond the pleura into the lung parenchyma was present. The surgical biopsy was performed.</p>
PATHOLOGY	<p>The paraffin sections of the parietal pleura demonstrated the connective tissue bundles infiltrated by dense sheets of quite regular neoplastic cells with the cytological details of small cell carcinoma [SCC] (Fig. 3). At the high magnification the majority of neoplastic cells looked larger than the usual appearance of SCC cells. Focal necrosis of carcinomatous infiltration was present. The neoplastic cells were positive for cytokeratin (AE1/AE3) and endocrine markers: Chromogranin and Synaptophysin.</p> <p>The comparative morphometric evaluation of the nucleus diameter was performed on the paraffin sections of the SCC of the pleura [pSCC] and 3 resected SCC of the lung [ISCC] (the archival material of DQP ITB&LD). The study was carried with the computerised system for image analysis "SAMBA 2005" with software for morphometry (Unilog, France. The population of 200 neoplastic nuclei was measured in every section at the magnification 400x (objective 40x and ocular 10x). The diameters of the nuclei were calculated from the mathematical formula:</p> $R_{\text{equiv}} = \sqrt{R_a \times R_b}$ <p>(R_{equiv} – radius of equivalent circle; R_a – minimal nuclear radius; R_b – maximal nuclear radius). The</p>

statistical analysis was performed using STATISTICA 6.0 for Windows 95 StatSoft, U.S.A); the test of Kolmogorov-Smirnov was used. The results showed that average nuclear diameter of pSCC was $9,4 \pm 1,2 \mu\text{m}$, and for ISCC was $8,54 \pm 0,98 \mu\text{m}$ ($p < 0.05$). The nuclear diameters in pSCC were larger (25th and 75th percentiles were: 8,74 and 10,15) than in ISCC (25th and 75th percentiles were 7,7 and 9,2). The spectrum of nuclear diameters in pSCC and ISCC cell populations is shown on the Figure 4 (Fig. 4).

DISCUSSION

Small cell carcinoma commonly occurs in the lung in 16% of all lung cancers [3]. The extrapulmonary origin of SCC is much less common [4]. Referring to the primary pulmonary localisation of SCC, the most common site is the bronchial wall, usually the segmental bronchus with the neoplastic proliferation encircling and narrowing the bronchial lumen, and with spreading to the local lymph nodes and surrounding tissues, sometimes into the pleura. Primary pleural neoplasms are not so common. The vast majority of pleural neoplasms invade pleura secondarily and are related to bronchogenic carcinoma, breast cancer, lymphoma, ovarian or gastric carcinoma [1]. The primary proliferation of SCC within the parietal pleura and its spreading along the pleura is very unique for this histologic type of carcinoma and according to our knowledge our case the second one in the literature [2].

In the presented case the clinical and radiological symptoms of the neoplasm were very suggestive of malignant mesothelioma what could have been misleading for a further chemotherapy. The histological examination of the neoplasm morphology was of fundamental importance for the proper effective treatment of the patient. The patient was treated with cisplatin and etoposide with partial remission after 6 courses. After next 3 months the progression of neoplastic diseases was noticed in the mediastinal lymph nodes. The good response was observed after implementation of the second line drugs (cyclophosphamide, doxorubicin and vincristine).

The diagnosis and therapy of carcinoma are largely dependent upon the biopsy interpretation and proper pathologic subclassification of tumour. One of the most difficult problem for the pathologists is the tumour appearance overlapping the categories of SCC and large cell undifferentiated carcinoma. The presented case of pSCC illustrates SCC with the high proportion of large carcinomatous cells within the cellular population (expressed as the nuclei diameter). Our comparative morphometric studies indicate that the cellular population of pSCC was composed of the higher number of larger cells than the range of cells in the resected ISCC. This cytologic feature occurred in pSCC can create some diagnostic problems for the pathologist who concentrates a main attention on the size of the neoplastic cells rather than on the cytological details of carcinomatous cells.

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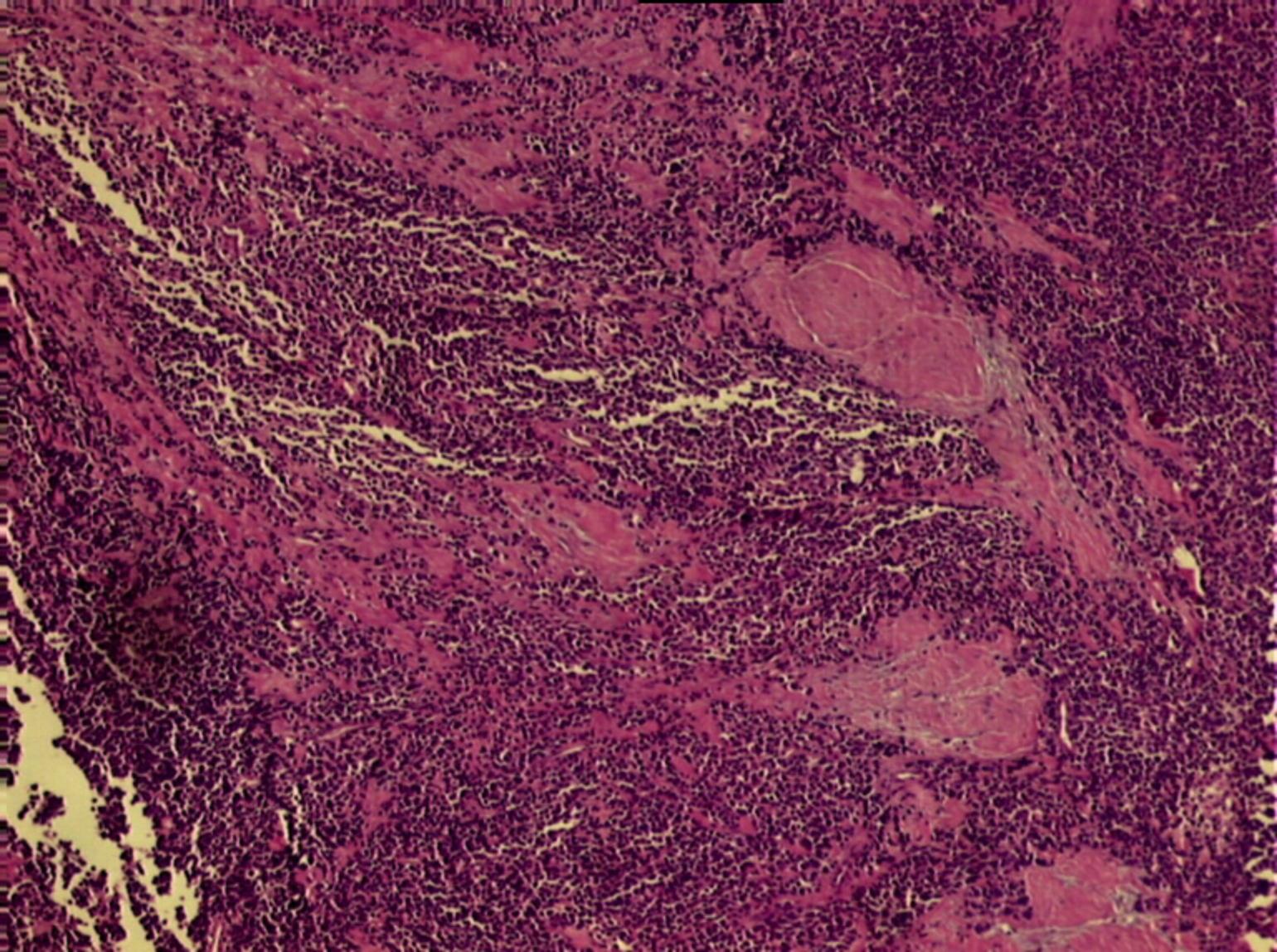
Legends

[Figure 1](#): Postero-anterior radiograph shows a large right sided pleural effusion with a lobular thickening of pleura. Right hilar and paratracheal lymphadenopathy is seen.

[Figure 2](#): CT image. A very large pleural effusion partly obscuring the lobular thickening of the pleura. Right lower lobe compression and the subcarinal lymph node enlargement is seen.

[Figure 3](#): The microscopic view of pleural biopsy showing the sheets of neoplastic cells infiltrating the collagen bundles (H&E, 10x10)

[Figure 4](#): The frequency distribution of the nuclear diameters in pSCC and ISCC cell populations.



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THICK: 10.0
INDEX: 10.0
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mA: 125
PITCH: 1.50

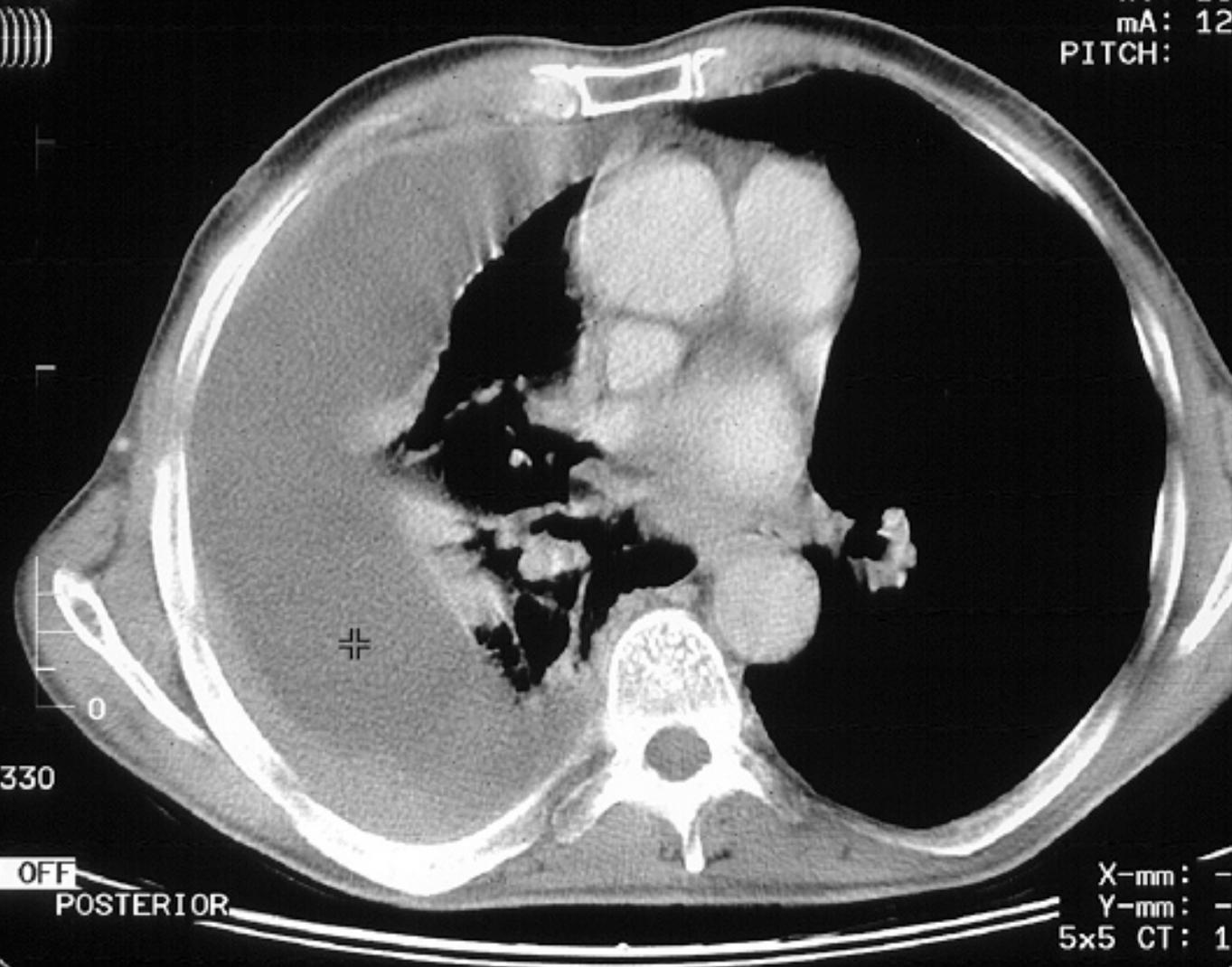
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X-mm: -69
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