

# Small Cell Carcinoma Manifesting as a Bulky Thoracic Mass in a Pregnant Woman: A Case Report<sup>1</sup>

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The classic presentation of small cell carcinoma is hilar or mediastinal lymph node metastases while the primary tumor remains an occult tumor. Grossly enlarged hilar and mediastinal lymph nodes can be frequently seen on the chest radiographs and CT scans. We report here on a case of small cell carcinoma that manifested as a unilateral bulky thoracic mass in a pregnant woman.

**Index words :** Lung neoplasms, CT  
Mediastinum

Small cell carcinoma accounts for 20 - 30% of all lung cancers and they have a relatively poorer prognosis than that for all the known lung cancer cell types. Radiographically, the most typical sign of small cell carcinoma is a central mass that represents metastasis to the hilar or mediastinal lymph nodes, and any hilar or mediastinal lymphadenopathy is usually bulky (1, 2). To the best of our knowledge, there have been few radiologic reports about the bulky thoracic mass patterns of small cell carcinoma (3 - 5). We report here on a case of small cell carcinoma that manifested as a unilateral thoracic bulky mass in a pregnant woman.

## Case Report

A 35-year-old pregnant woman at a gestational age of

29 weeks was hospitalized after experiencing dyspnea for the previous months. This symptom was aggravated since 10 days ago and she could not lie down without an oxygen supply due to her severe dyspnea. She also complained of general weakness and dizziness. She had no any history of smoking, allergy or other cardiovascular disease. On physical examination, there was no breath sounds at the right chest. The laboratory findings revealed pregnancy-related anemia and mild hypocapnea due to dyspnea-related hyperventilation.

The initial chest radiograph showed total opacity in the right hemithorax, and mediastinal shift to the left was also noted (Fig. 1A). The precontrast CT demonstrated heterogeneous attenuation of the right thoracic mass, including a focally high attenuation portion that was suggestive of hemorrhage (Fig. 1B). On postcontrast CT, a mildly enhanced, bulky soft tissue mass with necrotic foci was noted at the right hemithorax and the mass extended toward the mediastinum and caused mediastinal shift (Fig. 1C). The mass was so bulky it involved nearly the entire right hemithorax and the mass contained an internal necrotic portion (Fig. 1D). Some portion of lung parenchyma was collapsed. Multiple enlarged mediastinal lymph nodes, several enlarged both supraclavicular lymph nodes, a moderate pleural effu-

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Received June 26, 2006 ; Accepted October 11, 2006

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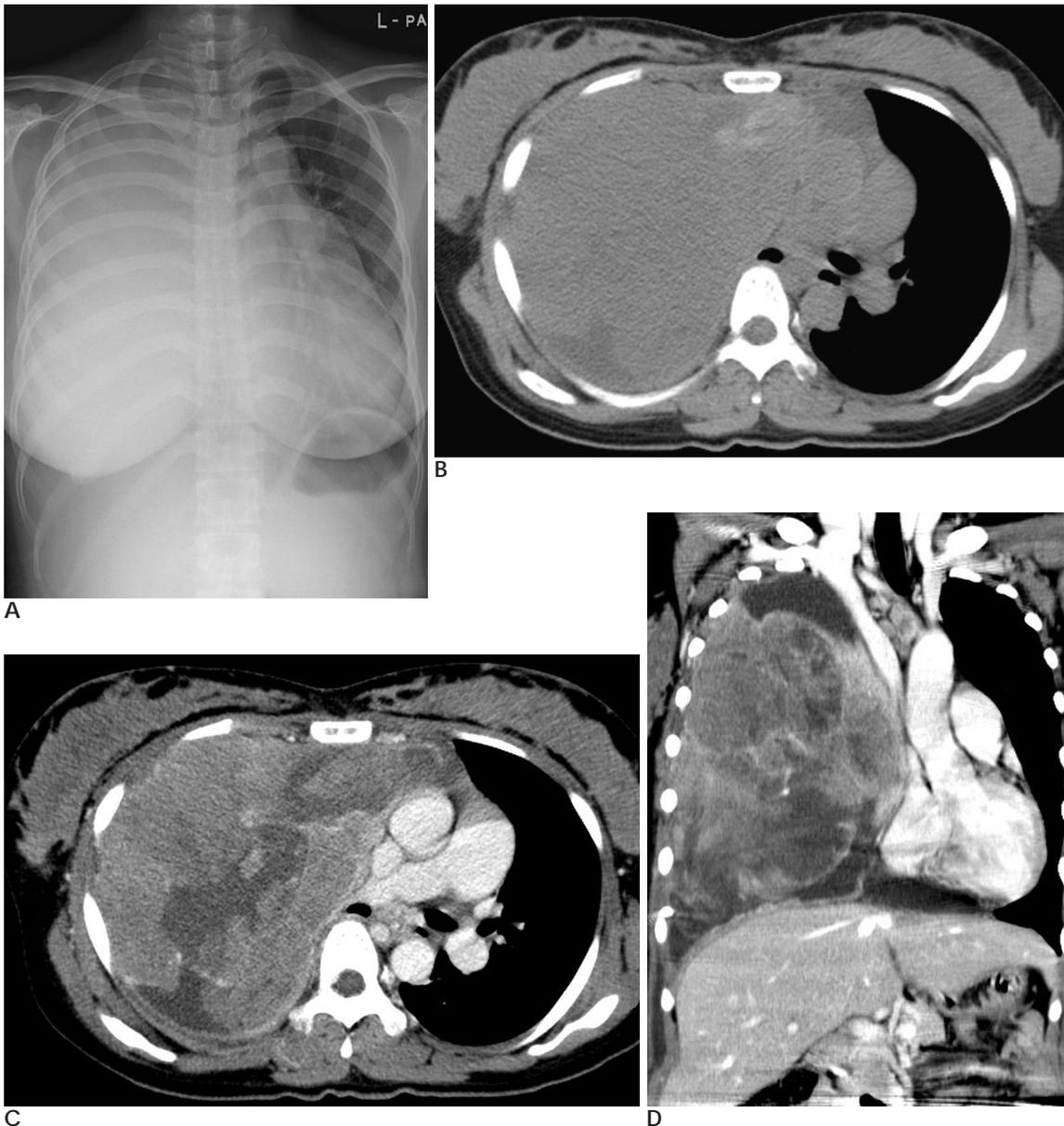
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sion and a small pericardial effusion were noted. Small celiac axis lymph nodes were also observed. However, any other metastatic lesions of the lung, liver or adrenal gland were not noted.

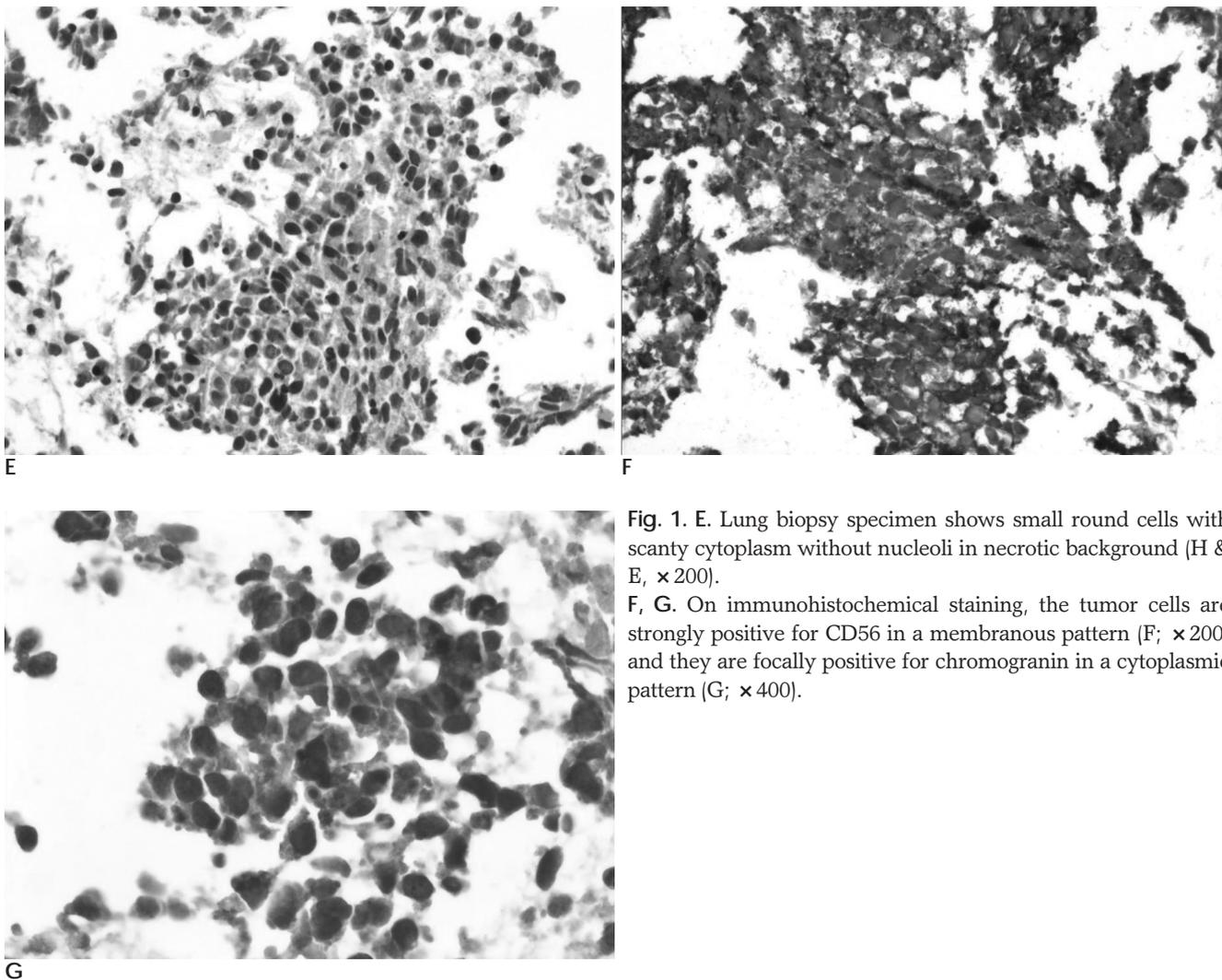
Aspiration of the pleural fluid was performed and the color was red. The level of lactate dehydrogenase of the pleural fluid was very high (2,337 IU/L). The other results of the chemical studies we performed were not remarkable, including the tumor markers for pleural fluid.

Percutaneous needle biopsy of the mass was done un-

der CT guidance. The pathologic specimen showed clusters of small round tumor cells with scanty cytoplasm, nuclear molding and finely granular chromatin without nucleoli (Fig. 1E). On Papanicolaou staining, clusters of small round tumor cells with scanty cytoplasm, nuclear molding and finely granular chromatin without nucleoli were noted and this was consistent with small cell carcinoma. On immunohistochemical staining, the tumor cells were strongly positive for CD56 in a membranous pattern (Fig. 1F) and they were focally positive for chro-



**Fig. 1.** Small cell carcinoma in a 35-year-old pregnant woman with dyspnea. **A.** The initial chest radiograph shows total opacity in the right hemithorax and mediastinal shift toward the left. **B.** The precontrast CT scan shows heterogeneous attenuation of the right thoracic mass, including a focally high attenuation portion, and this was suggestive of hemorrhage. **C, D.** The contrast-enhanced CT scan shows a right thoracic bulky soft tissue mass with mild enhancement and necrotic foci. Note the mediastinal shift, the enlarged mediastinal lymph nodes and the right pleural effusion.



**Fig. 1.** E. Lung biopsy specimen shows small round cells with scanty cytoplasm without nucleoli in necrotic background (H & E,  $\times 200$ ). F, G. On immunohistochemical staining, the tumor cells are strongly positive for CD56 in a membranous pattern (F;  $\times 200$ ) and they are focally positive for chromogranin in a cytoplasmic pattern (G;  $\times 400$ ).

mogranin in a cytoplasmic pattern (Fig. 1G). So, the final pathologic diagnosis was small cell carcinoma.

A preterm, 31-week-old boy was then born by normal vaginal delivery due to premature rupture of the placental membranes. Sadly, about two weeks later, the patient expired due to respiratory failure.

### Discussion

Small cell carcinoma is derived from the Kulchitsky-type cell. Histologically, a small oat-shaped cell is most often identified. The primary lesion of small cell carcinoma is usually small and difficult to detect on radiography. The tumor generally metastasizes early in its course. There is rapid invasion of lymph nodes and blood vessels, and this leads to widespread dissemination before any pulmonary symptoms become present (1).

Radiographically, the most typical sign of small cell

carcinoma is a hilar or mediastinal lymphadenopathy. As the disease progresses, the mediastinum can be diffusely involved. The mass usually forms a large mantle of soft tissue and this infiltrates the mediastinum, with encasement of the pulmonary artery and/or the aortic arch vessels. This extensive hilar and mediastinal lymphadenopathy frequently results in extrinsic compression of the airway (1, 2). Pleural effusions can be identified in 40% of the small cell carcinoma cases, as was noted in this case (6, 7).

Although there have been rare radiologic reports about small cell carcinoma manifesting as a large peripheral mass, this malady may present as a peripheral mass (3 - 5). It more typically shows a highly malignant and undifferentiated cell type (4). It is the least common cause of peripheral nodule of all the cell types of bronchogenic carcinoma. The Armed Forces Institute of Pathology study stated that only 14% of small cell carcinomas were peripheral at presentation (1, 5).

Accompanying hilar and mediastinal lymphadenopathy is also frequently present. In this case, the main CT feature was a bulky thoracic mass that caused mediastinal shift. Although there were several enlarged mediastinal lymph nodes, they were not as bulky as the typical manifestation of small cell carcinoma.

When making the radiologic differential diagnosis of this case, the possibility of sarcomatous tumor or pulmonary blastoma might be increased compared to the possibility of bronchogenic carcinoma. The clinical findings and location of the mass might be helpful for the differential diagnosis from other bulky thoracic masses such as pulmonary sarcomas, pulmonary blastoma or hemangiopericytoma (8, 9).

Furthermore, the patient was a pregnant woman in this case, which is suggestive of another unusual point. The pregnancy could have contributed to the evolution of the bronchogenic carcinoma via the increased levels of gestational hormones, especially the estrogen, because the estrogen receptor has an important role in regulating growth (10).

On the pathologic examination, the tumor cells showed small round nuclei and scanty cytoplasm, nuclear molding and finely granular chromatin without nucleoli in the necrotic background, and this was all suggestive of small cell carcinoma. The pathologic differential diagnoses included small cell carcinoma, malignant lymphoma, pulmonary blastoma and non-small cell carcinoma. On immunohistochemical staining, the small cell carcinoma was strongly positive for CD56, focally positive for chromogranin and negative for cytokeratin, TTF1, vimentin, cytokeratin 7, cytokeratin 20,

LCA and P63, so it could be differentiated from other malignant tumors.

In conclusion, this is unusual case of small cell carcinoma that manifested as a unilateral bulky thoracic mass in a pregnant woman.

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