Solitary Choriocarcinoma in the Lung

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A 32-year-old South Korean woman, nonsmoker, mother of a 2-year-old boy presented herself at the gynecological emergency room with lower abdominal pain and vaginal bleeding. A urinary pregnancy test was found positive and the serum β-human chorionic gonadotropin (β-HCG) level was elevated at 229 U/l. Vaginal ultra sound was described as normal except for a right ovarian cyst. Suspecting an extrauterine pregnancy, exploratory laparoscopy, hysteroscopy, and curettage were performed and proved negative for pregnancy or tumor.

Magnetic resonance imaging of the pelvis and the head did not reveal any pathologic lesion. A thoracoabdominal computed tomography scan demonstrated a spiculated 15-mm diameter lesion in the right upper pulmonary lobe. A radiolabeled [18F]-2-fluoro-deoxy-D-glucose positron emission tomography scan (Fig. 1) confirmed the isolated hypermetabolic character of this lesion (standard uptake value 3.5).

A transthoracic tru-cut biopsy of the pulmonary lesion consisted mainly of hemorrhagic and necrotic tissue with some rare syncytial-like cells, expressing β-HCG antibody. Patient was referred to thoracic surgeons who performed a superior right lobectomy with a conventional mediastinal node dissection. The microscopic examination revealed a circumscribed subpleural proliferation of an admixture of cytotrophoblasts, syncytiotrophoblasts, and intermediate trophoblasts as clusters of cells with prominent hemorrhage and necrosis. Tumor cells showed immunoreactivity for CK7 and β-HCG but were negative for pulmonary tumor markers: CK20, thyroid transcription factor-1, and p63 (Fig. 2). Diagnosis of metastatic choriocarcinoma was retained. β-HCG level regressed postoperatively to 4 U/l. She was treated with two cycles of adjuvant platinum-based chemotherapy and is now under follow-up survey, without recurrence 1 year postsurgery.

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DISCUSSION

Choriocarcinoma belongs to the far end of the spectrum of gestational trophoblastic diseases. Locally invasive and metastatic persistent gestational trophoblastic neoplasia usually develops under the form of a choriocarcinoma. Several theories explaining the existence of a solitary lung lesion of choriocarcinoma can be postulated.[1]

First, one can hypothesize that a trophoblastic differentiation or metaplasia can occur within lung carcinoma, resulting in a pure choriocarcinoma or a mixed tumor associating pulmonary tumor differentiation. This theory is sustained by nuclear immunoreactivity for thyroid transcription factor-1, a marker of pulmonary cells, in syncytiotrophoblast-like cells observed within malignant lung neoplasia.[2]

Second, on rare occasions, primary choriocarcinoma can arise from midline structures of the body, in the retroperitoneum, mediastinum, or intracranium. Some authors postulate that germ cells might migrate abnormally during embryogenic development, including lung parenchyma. Nongestational pulmonary choriocarcinoma might behave more aggressively, with a poorer prognosis.[3] Assuming that primary lung choriocarcinoma exists, it remains an exceedingly rare disease, with only about 25 cases reported to date.[4]

Third, choriocarcinoma lesions of the lung could represent metastases from an undetected trophoblastic disease, which might undergo a spontaneous regression, sometimes

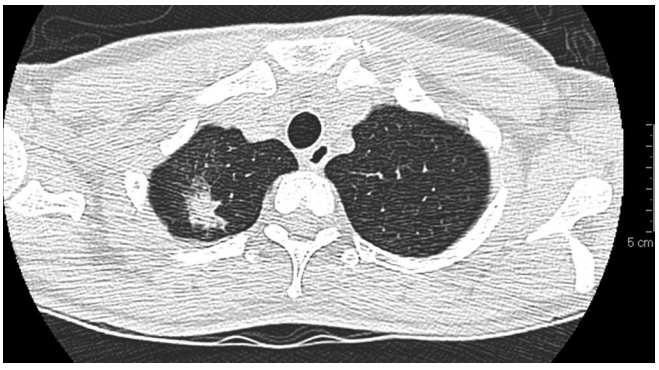

FIGURE 1. Computed tomography scan showing a spiculated 15-mm diameter lesion in the right upper pulmonary lobe and radiolabeled. [18F]-2-fluoro-deoxy-D-glucose. Positron emission tomography scan confirmed the hypermetabolic character of this lesion.

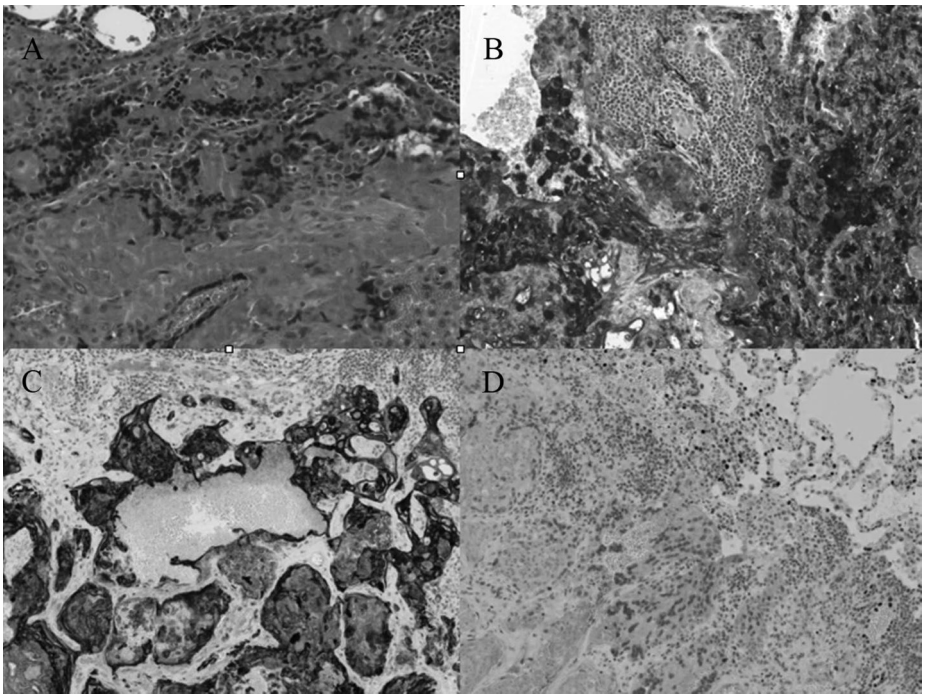

FIGURE 2. High-power view of a necrotic and hemorragic choriocarcinoma of the lung (*A*). Immunoreactivity of the choriocarcinomatous cells for β-HCG (*B*) and keratin 7 (*C*), and negativity for thyroid transcription factor-1 (a marker of lung carcinoma) (*D*).

leaving only uterine zones of scarring. This "burn out" hypothesis would represent a unique and specific feature of choricarcinoma, likely to become metastatic before detection of the primary lesion.

Finally, it should be noted that some rare primary lung carcinoma can be simply confused with choriocarcinoma. It is also well documented that many nontrophoblastic malignancies may produce ectopic placental hormones, including lung carcinoma.[5]

In our young patient, none of the above hypothesis can be excluded.

However, the medical history of our patient together with the pathologic findings of cytotrophoblastic and syncitiotrophoblastic cells, without any other component of primary lung carcinoma, strongly suggests the diagnosis of metastatic gestational trophoblastic disease.

REFERENCES

1. Rossi G, Valli R, Rivasi F, et al. Does primary pulmonary choriocarcinoma really exist? *Chest* 2003;123:313.
2. Chen F, Tatsumi A, Numoto S. Combined choriocarcinoma and adenocarcinoma of the lung occurring in a man: case report and review of the literature. *Cancer* 2001;91:123.
3. Umemori Y, Hiraki A, Aoe K, et al. Primary choriocarcinoma of the lung. *Anticancer Res* 2004;24:1905.
4. Sridhar KS, Saldana MJ, Thurer RJ, et al. Primary choriocarcinoma of the lung: report of a case treated with intensive multimodality therapy and review of the literature. *J Surg Oncol* 1989;41:93.
5. Demirtas E, Krishnamurthy S, Tulandi T. Elevated serum beta-human chorionic gonadotropin in nonpregnant conditions. *Obstet Gynecol Surv* 2007;62:675.

