J Korean Med Sci 2003; 18: 618-20
ISSN 1011-8934

Congenital Neuroblastoma with Multiple Metastases : A Case Report

Neuroblastomas are derived from the neural crest ectoderm, and are the most common solid abdominal masses of infancy. Congenital neuroblastoma, however, is rare. We report a rare case of congenital neuroblastoma with multiple metastases found at autopsy, performed at 2 days after birth. He was born by cesarian section and weighed 2,350 g. His respiration was weak and abdomen was distended. The patient died 2 days after birth. Postmortem examination revealed a relatively well demarcated ovoid mass, in the left adrenal, with necrosis and hemorrhage. Multiple small metastatic tumor nodules in the liver, lung, kidney, brain, rib, thyroid glands, and spleen, were noted. The histopathological pictures confirmed the diagnosis of neuroblastoma of the adrenal with multiple metastasis.

Key Words : *Neuroblastoma; Congenital; Neoplasm Metastases; Adrenal Gland Neoplasms*

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Received : 14 June 2002
Accepted : 10 October 2002

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INTRODUCTION

Neuroblastoma is the most common malignant tumor in the neonatal period, and accounts for 20% of all malignancies duing period (1). Congenital neuroblastoma is uncommon, and about 80 cases have been described (2). Although neuroblastoma can metastasize in utero, congenital neuroblastomas with multiple metastases are rare. We present a case of congenital neuroblastoma with multiple metastases, which is the first case among Koreans.

CASE REPORT

He was born by cesarian section at 38 weeks of gestation. He weighed 2,350 g and had Apgar score of 4 at 5 min. Maternal history (27-yr-old, 1-0-0-1) was unremarkable. Prenatal ultrasound at 36 weeks, gestation had shown an increased fetal abdominal circumference, but no abdominal mass was reported. During physical examination, the baby was pale and tachypnoic. The abdomen was markedly distended, while multiple palpable purpura were distributed over his body. The pulse rate was 144/min, respiratory rate was 36/min, and blood pressure was 34/20 mmHg. Two days later, he died. An autopsy was peformed.

Postmortem examination, opening the peritoneal cavity, showed serosanguinous fluid (about 50 mL) and a few palpable small nodes in peritoneal wall. In abdominal cavity, it showed enlarged liver with multiple tiny to small nodules and a relatively well defined huge mass (Fig. 1), adherent left kidney and adrenal glands, with necrotic and hemorrhagic features. The mass measured $5.4 \times 5.0 \times 3$ cm and weighed 155 g in the aggregate. It was grossly difficult for us to find out whether the primary origin of the tumor is kidney or adrenal gland. The chest wall showed a small mass at left sixth rib and both lungs were solid in consistency and showed gray to dark reddish patches. The spleen and thyroid gland showed multiple small nodules. The brain was grossly unremarkable but, by the light microscopy, the multple foci of tumor metastasis were identified in the cerebral cortex. Microscopically, the tumors are composed of sheets of small cells with hyperchromatic nuclei and scanty cytoplasm. The tumors frequently have a lobular apperance owing to the presence of thin fibrovascular septa between groups of tumor cells (Fig. 2). Several foci of lymphovascular spaces with tumor emboli were also noted. The tumor cells were immunoreactive for neuron specific enolase, synaptophysin, and chromogranin (Fig. 3), while desmin, MIC 2, and leucocyte common antigen were negative. The pathological findings of liver, kidney, lung, brain, spleen, thyroid gland, and rib biopsies were similar. A diagnosis of adrenal neuroblastoma with multiple metastases (Stage IV) was made.

DISCUSSION

Neonatal tumors are rare. They compromise 2% of all pediatric malignant tumors, and the most common neonatal tumors is neuroblastoma, accounting for 20% of tumors in this

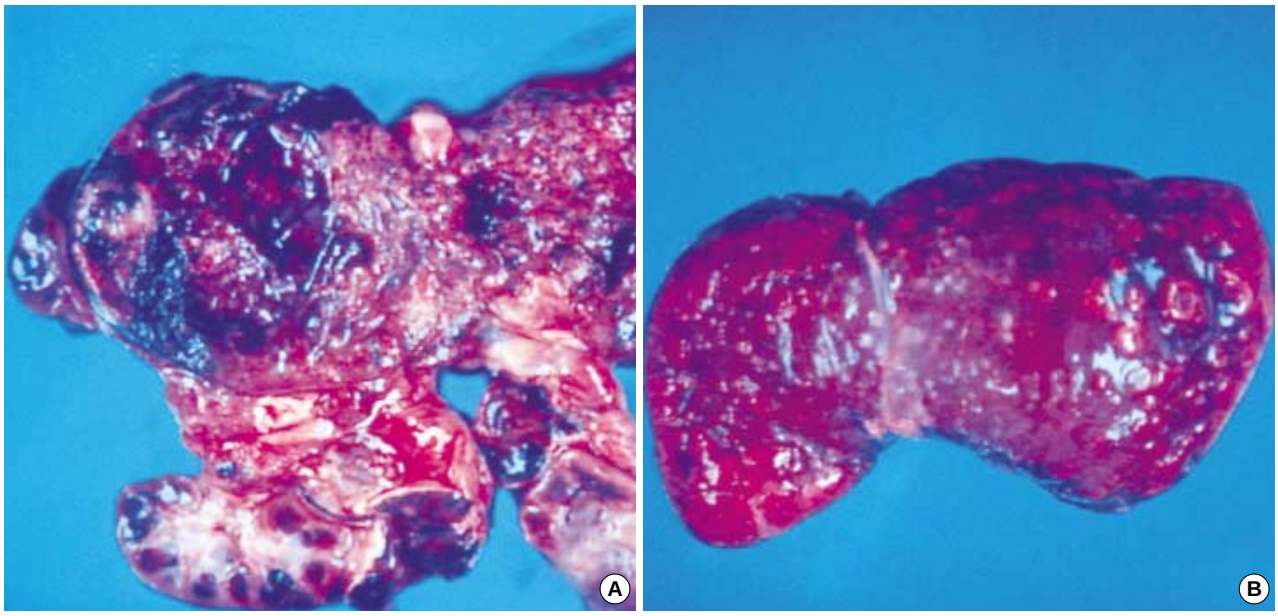

Fig. 1. In the adrenal, the tumor mass, adherent to the left kidney, is relatively well circumscribed and shows a variegated appearance with hemorrhage and necrosis (A). In the liver, multiple small metastatic nodules are noted (B).

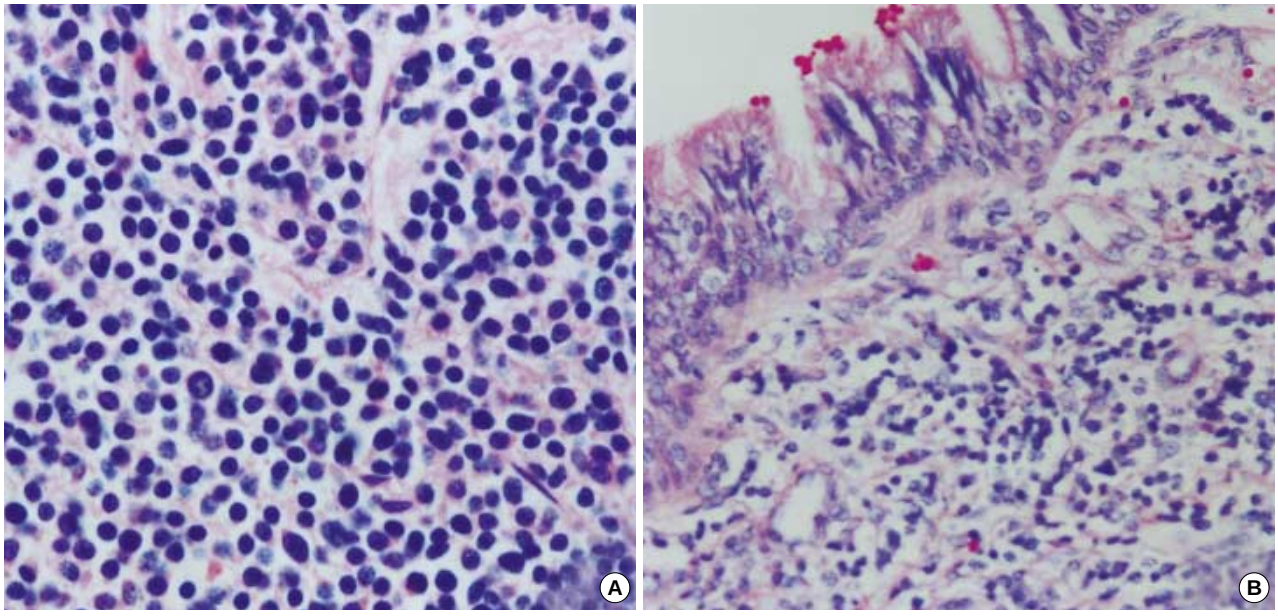

Fig. 2. The tumors are composed of sheets of small cells with dark nuclei and scanty cytoplasm. The tumor cells are separated by the thin fibrous septa. (A); the adrenal gland (B); the lung (H&E ×400, ×200).

period (1). Neuroblastoma originates from neural crest cells of the adrenal medulla or sympathetic ganglia. Congenital neuroblastoma is uncommon, and about 80 cases have been reported (2). According to the Korean literature, Myong et al. (3) had reported an autopsy case, but there were no cases of multiple metastasis including lung and brain. Neuroblastoma can metastasize in utero. The most common site of distant metastses is the fetal liver. Other sites include, placenta, retroperitoneal nodes, paraspinal region, bone, skin, and umbilical cord (4, 5). The pulmonary and brain metastases are uncommon.

The concept of in situ neuroblastoma was initially proposed by Beckwith and perrin in 1963 (6) for neuroblastomatous foci confined to the adrenals of newborns. The incidence rate varies from 0.4 to 2.5% in different autopsy series. This high rate, compared with rarity of clinically apparent neuroblas-

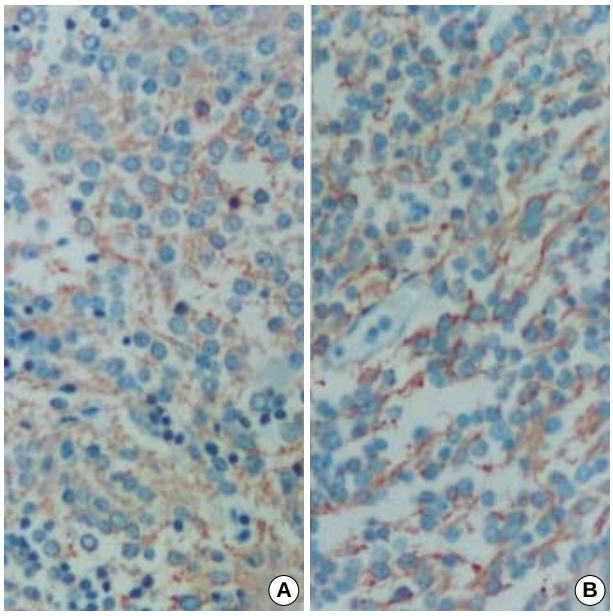

Fig. 3. Immunohistochemical stains against neuron specific enolase (A) and chromogranin (B) show diffuse strong positivity in the tumor cells (×200).

tomas, has suggested that a substantial number may undergo spontaneous regression and degeneration or maturation (7, 8). In our case, the occurrence of multiple lesions was indicative of metastasis in utero, reflecting that the adrenal mass might be the primary malignancy.

Neuroblastomas commonly present with a palpable abdominal mass, abdominal pain, fever, bone pain, opsoclonus, cerebellar ataxia, orbital ecchymosis or intractable diarrhea, and less commonly with myoclonus (2). Although intraglandular or intratumoral hemorrhage is common, massive hemorrhage is rare (9).

Ultrasound is a useful screening tool in the evaluation of abdominal neuroblastoma. In this case, we do not know whether the adrenal or masses of other sites were overlooked, or there were rapid-growing abdominal tumors during the last 3 weeks of gestation. The ultrasound appearances of perinatal adrenal neuroblastoma are variable and range from cystic, mixed cystic and solid, to completely solid or hyperechoic masses. They even contain foci of calcification (2, 10).

The treatment of neuroblastoma depends on the stage, and it includes surgical excision, multiagent chemotherapy, and bone marrow transplantation (11). Most patients with congenital neuroblastoma have a favorable stage of disease with excellent long-term prognosis. However, in our case, the patient died due to respiratory failure, resulting from the complications of metastatic disease, rather than the primary tumor.

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