Spontaneous Regression of Primary Mediastinal Germ Cell Tumor

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A case of primary mediastinal germ cell tumor, which demonstrated spontaneous regression, is presented. The serum human chorionic gonadotropin level was elevated on admission and then decreased to the normal range with decrease in the size of the anterior mediastinal mass. Thoracotomy was performed with artificial replacement by grafts between the bilateral brachiocephalic veins and the right atrium. Histological diagnosis of combined teratoma with seminoma was made. After subsequent chemotherapy, the patient has remained alive without recurrence for over 10 years.

Key words: spontaneous regression – primary mediastinal germ cell tumor – teratoma – seminoma – human chorionic gonadotropin

INTRODUCTION

Spontaneous regression is extremely rare but has occurred in several types of malignant tumors (1-5). However, spontaneous regression of primary mediastinal germ cell tumor has not previously been reported. We have encountered a case of primary mediastinal germ cell tumor that demonstrated spontaneous regression before surgery, in addition to prolonged disease-free survival after a combination of surgical resection and chemotherapy.

CASE REPORT

A 22-year-old non-smoking Japanese man was hospitalized in August 1987 because of a mass shadow discovered on routine chest radiography. There was a 4-month history of anterior chest pain, but no history of fever, dyspnea or body weight loss. Physical examination revealed a well developed, thin man in no acute distress. No lymphadenopathy was found. The chest, abdomen and extremities were normal. The bilateral testicles and scrotal contents were normal to palpation. Neurological examination was negative. Serum human chorionic gonadotropin (S-HCG) was slightly elevated at 20 mIU/ml (normal, 0-1.0 mIU/ml), but α-fetoprotein was normal. Other laboratory findings were normal. Chest radiography on admission revealed a large mass (10 x 12 cm) in the anterior mediastinum (Fig. 1A). The postcontrast computed tomographic (CT) scan of the chest showed a mediastinal mass protruding to both sides of the mediastinum and tending to displace the heart, trachea and great vessels posteriorly (Fig. 2). Percutaneous needle aspiration of the mass with a 21-gauge needle was performed, but the tissues obtained were non-diagnostic. During further studies, the size of the mass decreased gradually and spontaneously on repeated chest radiography, (Fig. 1B) and the S-HCG levels also returned to normal limits. The chest postcontrast CT scan at that time (Fig. 3) showed the decrease in the size of mediastinal mass which contained a large, low-density area. The compression of the bronchus and superior vena cava was improved. Thoracotomy was performed in September 1987. The mass with a firm, white nodule was located in the anterior mediastinum and directly invaded the right upper and middle lung lobes, part of the pericardium, bilateral brachiocephalic veins and superior vena cava. No evidence of lymph node involvement or metastasis was found. The mass was resected completely and we repaired with artificial replacement by grafts between the bilateral brachiocephalic veins and the right atrium.

The specimens of resected mass showed mostly fibrous granulation tissues and large foci of necrosis here and there (Fig. 4A). There were few cell infiltrations around the necrotic area. The firm nodular lesion was composed of cartilage and squamous cell elements. The firm nodular lesion was composed of cartilage and squamous cell elements. The firm nodular lesion was composed of cartilage and squamous cell elements. The firm nodular lesion was composed of cartilage and squamous cell elements. Thymic tissues were observed in the mass and a few oval atypical cells that were positive for human placental alkaline phosphatase were present (Fig. 4B). Thus the histological diagnosis was combined teratoma with seminoma in the thymus. The patient was then treated with combined chemotherapy (cisplatin, peplomycin, vinblastine). He has remained alive without evidence of recurrence for over 10 years.

DISCUSSION

Spontaneous regression of primary or metastatic gestational germ cell tumors (seminoma, embryonal carcinoma or chorio-
Spontaneous regression of mediastinal tumor

Figure 1. Sequential chest roentgenogram demonstrating a decrease in the mass shadow in mediastinum. Chest roentgenograms (A) on admission and (B) about 5 weeks after admission.

Figure 2. Chest CT scan on admission, showing a large anterior mediastinal mass.

Figure 3. Chest CT scan after spontaneous regression, showing the decrease in the size of the mediastinal mass which contained a large, low-density area.

carcinoma) has been described (2,4-7) but, to our knowledge, spontaneous regression in a patient with primary mediastinal germ cell tumor has not been reported previously.

The mechanisms for spontaneous regression of malignant tumor remain unknown (1-3). The postulated mechanisms include modification of the immunological factors, concomitant viral or bacterial infections, hormonal factors and elimination of carcinogens. Unfortunately, clinical courses, serial examinations of laboratory data and pathological findings of the resected tumor revealed little information to elucidate the mechanism of regression in the present case. Previous case reports usually did not speculate a possible cause of the phenomenon (1-7).

Pathological examination showed extensive necrosis. Necrosis itself plays a role in controlling tumor growth and may lead not only to spontaneous regression but also to stabilization of the tumor or even its progression (2). In the present case, one explanation of regression is that small but significant necrosis related to aspiration might have restricted the blood flow to the surrounding area, resulting successively in massive necrosis. However, many reports of spontaneous regression have implicated surgical procedures as an element that may have increased immunologically resistance to tumor growth (2,3). Since the mass was found to have originated in the thymus, which is immunologically privileged, immune response against tumor cells might have been stimulated in the located tissue even by needle aspiration.

Clinically, spontaneous regression in the present case allowed us to resect the mass completely. Several case reports showed that patients with spontaneous regression had long-term survival and/or good prognosis (2,4-7). Since primary mediastinal germ cell tumors share many histological findings, their clinical behavior and prognosis are influenced by fractions of these elements within the tumors (8,9). Although modern multimodality therapy has considerably improved the outcome of this
Primary mediastinal germ cell tumors, although rare, should be considered in the differential diagnosis of mediastinal tumors. In addition, spontaneous regression may involve a much more complex set of clinical manifestations. Since a single center cannot accumulate enough cases for meaningful analysis, all such cases should be reported in order to accumulate sufficient data for analysis.

References