Primary Seminoma in the Middle Mediastinum: Case Report in a 69-year-old Male

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Primary mediastinal seminoma is an uncommon tumor usually located in the anterior mediastinum. The majority of cases occur in young males. We report here an extremely rare case of a 69-year-old male with primary seminoma in the middle mediastinum. The patient had no complaints, but an abnormal shadow was seen in a routine chest X-ray. We performed a tumorectomy in the middle mediastinum, a thymectomy and an orchidectomy and added postoperative chemotherapy. It seems that the tumor was not associated with the thymus, so we believe the tumor did not stem from the embryonic thymus. Our case demonstrated that mediastinal seminoma does not always occur in the anterior mediastinum of young males. Although this case is rare, seminoma should be included among the possible diagnoses of a middle mediastinal mass.

Key words: seminoma – middle mediastinum – extragonadal

INTRODUCTION

Primary extragonadal seminoma (EGS) is a rare tumor reported in the pineal body (1), the mediastinum (2) and the retroperitoneum (3). Of these three sites, the mediastinum is the most common site of occurrence, with 25–30% of all malignant mediastinal germ cell tumors (4). Primary mediastinal seminoma is usually located in the anterior mediastinum, with the majority of cases occurring in young males. We report here an extremely rare case of a 69-year-old male with primary seminoma in the middle mediastinum.

CASE REPORT

In April 1995, a 69-year-old male was admitted to our hospital to evaluate an abnormal shadow on a routine chest X-ray film. The patient had no complaints and the abnormal shadow was not observed in the previous year’s X-ray film. Laboratory studies upon admission revealed a normal blood cell count and chemistry profile, except for a slightly elevated serum creatinine level (1.3 mg/dl). Serum α-fetoprotein (AFP) and β human chorionic gonadotropin (HCG) were normal. The chest X-ray upon admission revealed a right upper mediastinal mass (Fig. 1). Thoracic CT showed a homogeneous mass surrounded by the trachea, superior vena cava and azygos vein (Fig. 2). Ultrasonography of the testes, kidney, spleen and liver were normal. Gallium scintigraphy and abdominal CT showed no abnormal findings.

A neoplasm was suspected and thoracotomy was performed on May 26, 1995. At surgery, the tumor was located in the middle mediastinum, surrounded by the superior vena cava and azygos vein, and was almost encapsulated. The tumor was removed totally, but the connection of the tumor and thymus was uncertain. Frozen-section diagnosis gave rise to a suspicion of germ-cell tumor. At permanent section, the tumor consisted of round and polygonal cells. Cells had clear or granular cytoplasm, with a large, centrally located nucleus and coarse-clumped chromatin (Fig. 3). Immunohistochemically, the tumor cells stained positively for placental alkaline phosphatase (polyclonal anti-placental alkaline phosphatase; DAKO, Glostrup, Denmark) (Fig. 3). There were no non-seminomatous components in the tumor. From these findings, we reached a diagnosis of a classical pure seminoma. Extended thymectomy 2 weeks after the first operation showed no specific finding in the thymus. Orchidectomy 3 weeks after the first operation revealed no tumor or scar in the bilateral testes. We finally diagnosed primary seminoma in the middle mediastinum.

One cycle of postoperative chemotherapy was performed with modified Einhorn’s PVB therapy (5) (carboplatin 200 mg/m² on day 1; vinblastine 0.15 mg/kg on days 1 and 2; and bleomycin
Figure 1. Admission chest X-ray showing a right upper mediastinal mass.

Figure 2. Computed tomography of the chest showing a homogeneous mass surrounded by the trachea, superior vena cava and azygos vein.

Figure 3. Microscopic features of the tumor. (a) Tumor cells showing clear or granular cytoplasm, large, centrally located nucleus and coarse-clumped chromatin. (b) Immunohistochemically, the tumor cells stained positively for placental alkaline phosphatase.

DISCUSSION

The anterior mediastinum is the most common primary extragonadal site for seminoma. Of 307 cases reviewed in the English-language literature since 1956, we found only one case of posterior mediastinum (6) and one of middle mediastinum (7). Mediastinal seminoma is often associated with the thymus. Knapp et al. (8) reported a seminoma 2.5 cm in diameter completely surrounded by thymus tissue. Some authors called the tumor thymic seminoma (9,10), but it is uncertain whether mediastinal seminoma always arises in the thymus because, in many cases, the tumor was a bulky mass which included the thymus at diagnosis. In this case, we performed additional thymectomy to evaluate the thymus but found no connection between the tumor and the thymus.

Although the exact extragonadal germ cell tumor (EGCT) histogenesis is not known, several theories have been proposed. Friedman (2) postulated that all germ cell tumors originated from extragonadal, potentially biphasic germ cells left within the embryonic thymus. Lattes (11) and Schlumberger (12) suggested that germinal tumors arise from a maldevelopment of the thymic gland during embryogenesis. More recently, it has been suggested that germ cells are present in apparently ectopic sites in all healthy persons, having been distributed widely during normal embryogenesis, conveying genetic information or providing regulatory functions at somatic sites (13). In our case, it seems that the tumor was not associated with the thymus, so we think the first two hypotheses do not apply to our case.

The indication of orchidectomy is controversial in this case. A theory that an EGCT metastasizes from degenerated occult primary testicular tumors is not supported by the autopsy findings of Luna and Valenzuela-Tamariz (14). It is accepted that routine biopsy or orchidectomy is not needed in EGCT if no evidence exists for retroperitoneal involvement and no abnormality of the testicle is observed (14,15). Our case is in an unusual location for the tumor type and patient's age. Few cases have been reported where a mediastinal mass was found to be associated with
testicular seminoma (16,17). For these reasons, we performed orchidectomy with the patient’s agreement to evaluate the testes in detail.

In this case, we think the first operation was appropriate in order to diagnose the tumor in the middle mediastinum, but retrospectively the second operation was not necessarily needed, because the resected thymus was completely normal.

Current therapeutic recommendations for mediastinal seminoma are in transition. Traditional therapy has been initial surgical biopsy or debulking followed by radiation for localized disease (18). In spite of the high radiosensitivity, one third of patients relapsed, following radiotherapy, with distant metastases or marginal recurrences (19). Recent studies, in contrast, show good results when extragonadal seminoma was treated with chemotherapy (20–22). For mediastinal seminoma, an overall survival in excess of 80% can be expected with the use of chemotherapy, with or without radiotherapy (23). Chemotherapy has also been effectively used for very bulky seminomatous tumors. Generally, most clinicians now believe that surgery no longer plays a role in the definitive treatment of seminoma (24,25).

We obtained a good result with neoadjuvant chemotherapy in mediastinal seminoma in a 22-year-old male with Crohn’s disease (26). Based on our experience and on previous reports, we selected postoperative chemotherapy with modified Einhorn’s PVB therapy. Even though it is not certain that one cycle of chemotherapy will be enough to prevent recurrence in this case, we believe chemotherapy to be more effective than radiotherapy in preventing recurrence of seminoma.

We chose carboplatin instead of cisplatin owing to the slight disturbance of renal function seen with the use of cisplatin. Some authors reported good results for carboplatin-based chemotherapy in mediastinal (23) and testicular (27) germ cell tumors. Horwich et al. (28) recommended that carboplatin be considered the treatment of choice for advanced stages of seminoma when limitations of toxicity are considered important.

Our case demonstrated that mediastinal seminoma does not always occur in the anterior mediastinum of young males. Although this case is rare, seminoma should be included among the possible diagnoses of a middle mediastinal mass.

References


