Extragonadal Germ Cell Tumors

Key words: gonadal, extragonadal, seminoma, nonseminoma

Germ cell tumors occur most commonly in the gonads, but infrequently appear in other locations such as the mediastinum, retroperitoneum, pineal gland and sacral area; 2–5% of the germ cell tumors are of extragonadal origin (1). Germ cell tumors are classified as follows; teratomas (mature, immature), seminomas, yolk sac tumors, embryonal carcinomas, choriocarcinomas, and combined germ cell tumors (2). The origin of extragonadal tumors is still uncertain. The cytogenetic finding on chromosome 12p appears to suggest that extragonadal tumors would be of gonadal origin (3).

In clinical and biological features, there are some common and different points between gonadal and extragonadal tumors. Common features are: 1) occurrence in young adults, mostly men, 2) midline location, 3) metastasis to lung, liver and bone, 4) seminomatous and nonseminomatous histological subtypes, 5) elevated serum tumor markers (α -fetoprotein=AFP, human chorionic gonadotropin=hCG). Around 40% of patients with mediastinal seminoma and nonseminoma and those with retroperitoneal seminomas have elevated hCG. Patients with retroperitoneal nonseminomas have elevated hCG in higher percentage of around 70. Around 50–75% of patients with nonseminoma have elevated AFP (4), 6) isochromosome i(12p) (5), 7) sensitive to cisplatin-based combination chemotherapy. Features distinct from gonadal germ cell tumors are: 1) increased tumor bulk at presentation. Extragonadal germ cell tumors grow slowly and initially produce few symptoms. Around 30% of patients with mediastinal seminoma were asymptomatic, and the mass was discovered incidentally during routine chest X-ray (6), 2) anterior superior mediastinal predominance. The most common location of extragonadal germ cell tumors is the mediastinum and retroperitoneum, 54% and 45%, respectively, according to the reports by Bokemeyer et al (4, 7). In cases of primary mediastinal germ cell tumors, they usually originate from the anterior mediastinum, very rarely originate from the middle mediastinum (8–10), 3) predominance of nonseminomatous germ cell tumors.

See also p 1191.

According to the results from an international analysis with 635 cases with extragonadal germ cell tumors, 83% (524) were nonseminomatous and 16% (104) seminomatous germ cell tumors (4, 7). In primary gonadal tumors, the

proportion of seminomatous and nonseminomatous germ cell tumors is almost equal, 4) high frequency in patients with Klinefelter's syndrome. Klinefelter's syndrome, a male genetic disorder characterized by the 47, XXY karyotype is known to have increased risks for breast cancer and extragonadal germ cell tumors of the nonseminomatous subtype (11), 5) high frequency of development of hematological malignancies. An increased risk for developing leukemias such as acute megakaryoblastic leukemia appear only in patients with primary nonseminomatous mediastinal germ cell tumors, not in patients with primary retroperitoneal germ cell tumors (12, 13).

Prognosis for patients with mediastinal seminoma is fairly good, a 5-year survival rate of around 90%. Conversely, nonseminoma has a worse prognosis than seminoma with a 5-year survival rate of around 45% (4, 7). Patients with extragonadal germ cell tumors are treated at the present time with three or four cycles of cisplatin, etoposide and bleomycin. Standard cisplatin-based chemotherapy plus additional secondary surgery is the basis of treatment strategy. Radiotherapy is the treatment of choice for patients with definitive progression under chemotherapy.

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