Nonseminomatous germ cell tumor of the testis 9 years after a germ cell tumor of the pineal gland: case report and review of the literature

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Extragonadal germ cell tumors are extremely rare and account for only 3%-5% of all germ cell tumors. These tumors are rarely associated with metachronous primary testicular germ cell tumors. We report the fourth case of a primary germ cell tumor occurring after the treatment of a primary CNS germ cell tumor in a 27-year-old male with embryonal cell carcinoma of the testicle 9 years after the treatment of a germ cell tumor of the pineal gland. This represents the first case of a non-seminomatous germ cell tumor of the testicle after a CNS germ cell tumor. This case illustrates the importance of long term follow-up and self-examination in patients with extragonadal germ cell tumors.

Key Words: testicular cancer, extragonadal germ cell tumor, pineal gland

Introduction

Testicular cancer is the most common malignancy in men age 15-35.[1] Primary extragonadal germ cell tumors are rare with only approximately 1000 cases reported. Extragonadal sites reported for germ cell tumors include the mediastinum, retroperitineum, sacrococcygeal area, and pineal gland.[2-13] A second testicular primary germ cell tumor occurring after detection of an extragonadal germ cell tumor is rare and only thirty prior cases have been reported in the literature. Our report of a 27-year-old male with a non-seminomatous germ cell tumor of the testicle 9 years after a germ cell tumor of the pineal gland represents, to our knowledge, the thirty- first case.

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Case presentation

Our patient presented at age 18 with symptoms including headache, blurred vision, and vomiting.

Workup revealed a tumor of the pineal gland that was surgically resected. The tumor was a mixed germ cell tumor of embryonal cell carcinoma and teratoma. The patient underwent three cycles of bleomycin, etoposide, and cisplatin, as well as adjuvant radiation therapy. Two years later he had a local recurrence and a dural teratoma was resected and subsequent further radiation therapy ensued. Tumor markers at the time of his pineal tumor or local recurrence were unavailable. The patient had an uneventful medical course for the next 7 years until he presented to the emergency department with a painful, swollen left testicle. He revealed that he had noted the swelling and pain approximately 1 month prior to presentation. Ultrasonagraphy confirmed a left testicular mass. Further imagining studies were obtained including a CT scan of the abdomen and pelvis that demonstrated a 2.8 cm enlarged lymph node at the left renal hilum, Figure 1. Laboratory values revealed an elevated AFP at 2680, and normal beta HCG and LDH values. Left radical orchiectomy proved that the testicular mass was a mixed germ cell tumor with embryonal cell carcinoma and yolk sac tumor components , Figure 2. The tumor was confined to the testis and the spermatic cord margin was negative. He subsequently underwent a retroperitoneal lymph node dissection and tumor was present in the enlarged node at the renal hilum as identified on CT scan. The patient received two cycles of cisplatin and etoposide. The patient's tumor markers are now within normal limits and two surveillance CT scans have been negative for the presence of any tumor recurrence. He will continue to be followed with serial CT scans.

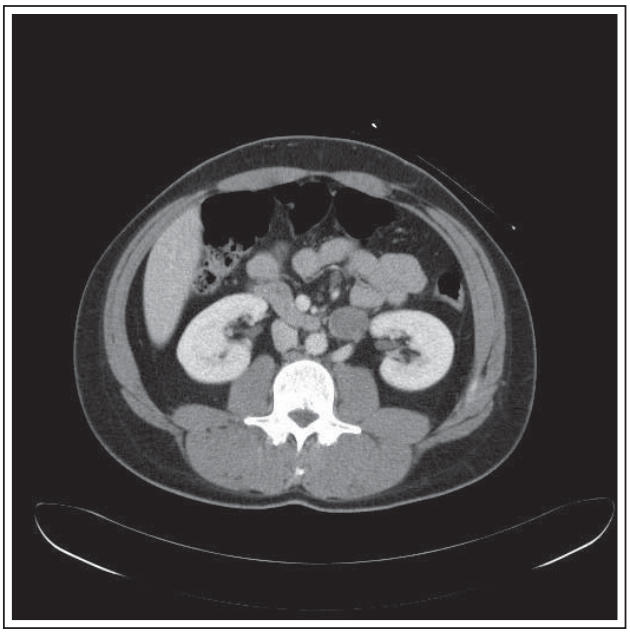

Figure 1. CT scan demonstrating 2.8 cm left hilar lymph node.

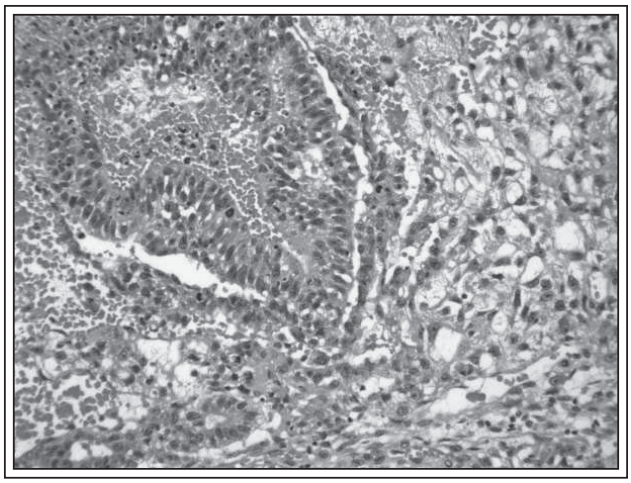

Figure 2. Histopathological picture of the testicular tumor.

Discussion

Thirty prior cases of testicular tumors arising after extragonadal germ cell tumors have been described in the literature.[2-13] The pathology of twenty-three of the thirty cases was consistent with testicular seminoma presenting several years after the first primary extragonadal germ cell tumor. The remaining cases report pathology illustrating metachronous testicular embryonal cell carcinoma. The testicular tumors presented an average of 7.1 years (range 3-22 years) after the original extragonadal germ cell tumor.

Primary germ cell tumors of the central nervous system are relatively uncommon and account for only 2% of CNS tumors.[11] This case represents only the fourth reported testicular germ cell tumor presenting after prior CNS germ cell tumor. The previously reported cases outlined seminomatous testicular tumors after CNS germinomas.[11-13] This case depicts the first non-seminomatous germ cell tumor of the testis after a primary CNS germ cell tumor.

The exact etiology of extragonadal germ cell tumors remains a mystery. A "burned out" testicular tumor was originally hypothesized as the origin of a metastatic extragonadal germ cell tumor. Autopsies revealed testicular scarring in these patients thought to represent a regressed tumor. Other theories for the origin of a primary extragonadal germ cell tumor include endoderm which fails to migrate to the scrotum, or germ cells arising from extragonadal totipotential cells.[14]

Patients with extragonadal germ cell tumors are at risk for developing a metachronous testicular tumor. The largest series from Hartmann et al reported an overall incidence of metachronous testicular tumors at 4.1% (16/635), with cumulative risk at 10 years at 10.3%.[2] Ultrasonagraphy at the time of the original diagnosis of extragonadal germ cell tumors should be obtained to rule out the possibility of an occult primary testicular tumor. Some authors recommend testicular biopsy of both testicles at the time of diagnosis to rule out carcinoma in situ of the testis which has been reported in up to 40% of cases.[9]

All patients must be aware that testicular tumors can develop many years after a primary extragonadal germ cell tumor. Patients need to be encouraged to do frequent self-testicular examinations. Other authors recommend serial scrotal ultrasonagraphy to accompany the routine CT scans and tumor markers followed for germ cell tumors.[9] However, a vast majority, 75%, of these patients recurred with seminoma. Overall, testicular seminoma has a very favorable prognosis with cure rates greater than 95%.[15] Therefore, we believe that these patients should perform self examinations frequently with a yearly physician examination. Serial ultrasounds can be considered but likely will not affect outcomes significantly given the high cure rate for testicular seminoma. Testicular biopsy at the time of original diagnosis, although recommended by other authors,[10] does not appear to be warranted. We do not recommend routine testicular biopsy in these patients because treatment of CIS remains controversial, delayed testicular malignancy occurs infrequently, and patients will be closely followed over a long period of time.

In conclusion, testicular tumors can occur, although rarely, more than 20 years after the successful treatment of extragonadal germ cell tumors. All patients should undergo a scrotal ultrasound at the time of original diagnosis to detect a possible lesion in a palpably normal testis. Patients must be cognizant of the fact that they are a risk for testicular tumors and should perform frequent testicular self examinations. □

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