Case Report

A case of testicular cancer with retroperitoneal lymph node metastasis of teratoma with somatic-type malignancy 18 years after initial treatment

Maiko Yamashita,[1] Takanari Sakai,[1,2] Shinichi Yamashita,[1] Fumiyoshi Fujishima,[3] Takuro Goto,[1] Takuma Sato,[1] Yoshihide Kawasaki,[1] Naoki Kawamorita,[1] Takaki Tanaka[1,2] and Akihiro Ito[1]

[1]Department of Urology, Tohoku University Graduate School of Medicine, [3]Department of Pathology, Tohoku University Hospital, Sendai, Miyagi and [2]Department of Urology, Hachinohe City Hospital, Hachinohe, Aomori, Japan

Abbreviations & Acronyms
AFP = alfa-fetoprotein
BEP = bleomycin, etoposide, cisplatin
CT = computed tomography
hCG = human chorionic gonadotropin
LDH = lactate hydrogenase
LR = late relapse
L-RPLND = laparoscopic retroperitoneal lymph node dissection
MRI = magnetic resonance imaging
OS = overall survival
RPLN = retroperitoneal lymph node
RPLND = retroperitoneal lymph node dissection
STM = somatic-type malignancy
TC = testicular cancer
WHO = World Health Organization

Introduction: In testicular cancer, late relapse of teratoma with somatic-type malignancy is rare and associated with a poor survival. A case of retroperitoneal lymph node metastasis of teratoma with somatic-type malignancy 18 years after initial treatment for testicular cancer is reported.

Case presentation: A 46-year-old man had a 15-mm-sized mass in the para-aortic region 18 years after initial treatment for testicular cancer, without elevated serum alfa-fetoprotein or human chorionic gonadotropin levels. Laparoscopic retroperitoneal lymph node dissection was performed. The pathological findings showed teratoma with somatic-type malignancy, and the findings of primary testicular cancer reported a yolk sac tumor, not teratoma.

Conclusion: Late relapse of teratoma with somatic-type malignancy was resected by laparoscopic retroperitoneal lymph node dissection. Therefore, long-term follow-up should be considered if patients with small retroperitoneal masses did not undergo retroperitoneal lymph node dissection, and early detection and surgical resection for relapse might be effective.

Key words: laparoscopic retroperitoneal lymph node dissection, late relapse, teratoma with somatic-type malignancy, testicular cancer.

Correspondence: Shinichi Yamashita M.D., Ph.D., Department of Urology, Tohoku University Graduate School of Medicine, 1-1 Seiryo-machi Aoba-ku, Sendai, Miyagi 980-8574, Japan.
Email: yamashita@uro.med.tohoku.ac.jp

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Keynote message

Patients with late relapse of teratoma with somatic-type malignancy in testicular cancer have a poor prognosis. Therefore, early detection and surgical resection for relapse of teratoma should be considered to improve these patients' prognosis.

Introduction

TC has improved, and even patients with metastases could be expected to achieve long-term survival with appropriate treatment with chemotherapy and/or residual tumor resection, including RPLND.[1–3] However, LR occurred in approximately 3% of patients with non-seminoma.[4] LR is defined as recurrence more than 2 years after completion of successful primary treatment for TC.[5] In particular, LR beyond 5 years is rare, and the clinical practice guideline on TC does not routinely recommend imaging tests beyond 5 years.[6] Meanwhile, the percentage of teratoma with STM was reported to be relatively high in LR of non-seminoma beyond 5 years.[7] A case in which an RPLN metastasis that occurred 18 years after initial treatment for TC was successfully resected by L-RPLND is described along with a review of the relevant literature.

Case presentation

A 26-year-old man underwent left high orchiectomy for left TC with multiple lung metastases at another hospital. The pathological findings showed a yolk sac tumor. Serum AFP and hCG

levels were 8802 and 146 mIU/mL, respectively, before the orchiectomy. Three cycles of multi-agent chemotherapy consisting of BEP were administered, but a growing mass was found in the right lung. One cycle of BEP was added, followed by resection of the mass by video-assisted thoracoscopic surgery. The pathological findings also showed a yolk sac tumor. Thereafter, the patient was followed up without additional treatment.

Eight years after the initial treatment, the patient was referred to another hospital due to relocation. CT showed a mass, 8 × 4 mm in the para-aortic region. After that, serum AFP, hCG, and LDH levels and/or CT were evaluated once a year. When he was 46 years old, 18 years after initial treatment for TC, the size of the retroperitoneal mass reached 10 mm. Six months later, the mass had enlarged to 15 mm (Fig. 1), and the patient was referred to our hospital. The tumor markers were not elevated: AFP 1.5 ng/mL, hCG <0.2 mIU/mL, and LDH 164 U/L. There was no abnormal fluorodeoxyglucose accumulation on positron emission tomography-CT. In addition, no abnormal findings were observed on gastrointestinal endoscopy, colonoscopy, or urinary cytology. An RPLN metastasis of teratoma was suspected, and modified L-RPLND were performed, according to the previous report.[8] The pathological findings showed teratoma with STM (Fig. 2), according to the WHO 2016 classification.[9] The pathological type of STM was adenocarcinoma. The surgical margins were negative, and the patient was closely followed up without additional treatment. At 1-year follow-up, the patient's ejaculatory function was preserved, and there was no evidence of recurrence or metastasis.

Discussion

An RPLN metastasis of teratoma with STM was safely resected by L-RPLND 18 years after initial treatment for TC, because the mass size was less than 2 cm, and it had not invaded around the mass. LR is rare in patients with non-seminoma.[4] However, the longest time to LR was reported to be 33.1 years.[7] Ehrlish *et al*. reported, with median follow-up of 15 years without RPLND of 141 patients with non-seminoma who achieved normalization of serum tumor markers and radiographic remission (residual mass <1 cm) after induction chemotherapy, 12 patients had relapse, and 2 (1.4%) experienced LR beyond 10 years.[10] The pathological types were germ cell tumors with elevated AFP in 2 patients. Nason *et al*. also reported that, of 191 patients with normal markers and residual masses (≤1 cm) after chemotherapy, 3 patients (1.6%) relapsed beyond 10 years (189, 262, and 336 months).[11] The pathological types were teratoma in 2

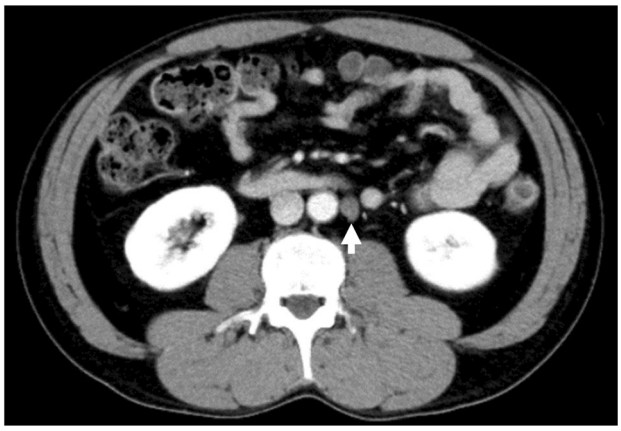

Fig. 1 Abdominal contrasted-enhanced CT 18 years after initial treatment for testicular cancer. A 15-mm-sized mass (arrow) is seen in the para-aortic region.

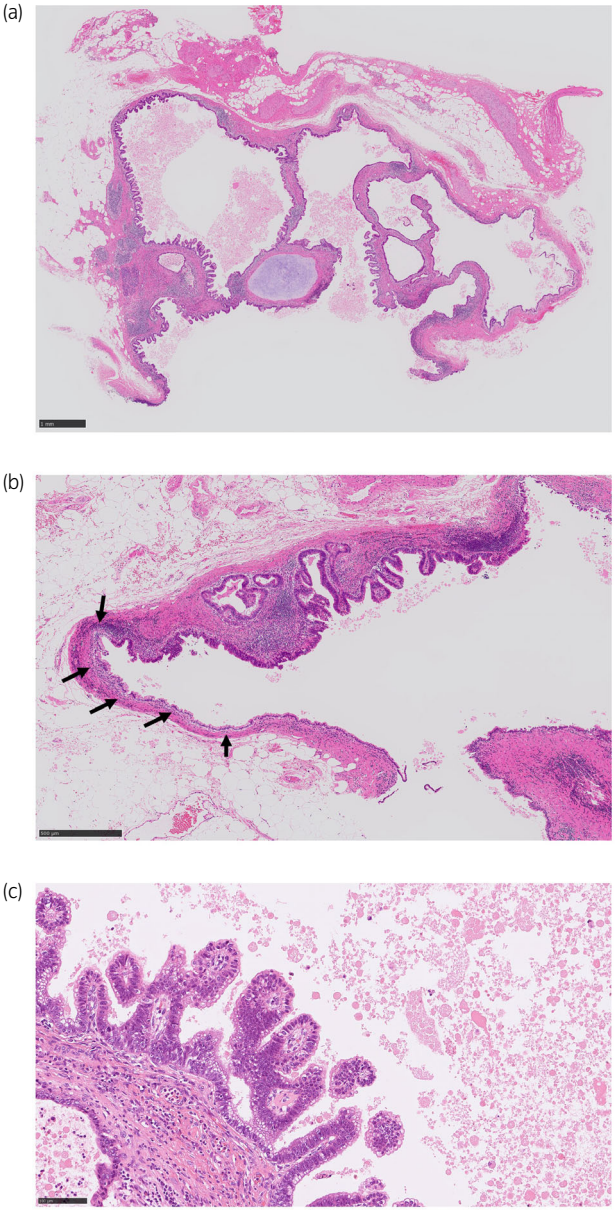

Fig. 2 Microscopic appearance (hematoxylin and eosin staining) of the retroperitoneal mass. (a) Adenocarcinoma with cystic appearance and cartilaginous tissue in the lymph node. Scale bar: 1 mm. (b) Most of the wall is coated with carcinoma cells, but partially with columnar epithelium without atypia (arrow). Scale bar: 500 μm. (c) At higher magnification. The epithelium lining the lumen shows obvious atypia and sometimes proliferates in a low papillary structure. Scale bar: 100 μm.

patients with normal markers and adenocarcinoma in 1 patient with abnormal markers. Interestingly, the presence of teratoma in orchiectomy specimen and the retroperitoneal mass size before chemotherapy were not predictors of relapse in non-seminoma.[10] The present case did not contain teratoma in the orchiectomy specimen and did not receive RPLND on initial treatment. Recently, the efficacy of abdominal MRI, which could replace CT during follow-up of TC survivors to reduce radiation exposure, was reported.[12] Therefore, long-term follow-up using CT or MRI might be considered if patients with small residual retroperitoneal masses did not undergo RPLND.

Teratoma with STM is relatively rare, accounting for approximately 2% to 8% of TCs.[7,13,14] The frequency of teratoma with STM increased in LR, accounting for 44% beyond 5 years after initial treatment.[7] Teratoma with STM was frequently found in the retroperitoneum, as well as in the testis. Necchi *et al*. showed that, of 48 patients with teratoma with STM, teratoma with STM occurred in the retroperitoneum in 46%.[15] In addition, the occurrence sites of teratoma with STM were the primary tumors in 35% and the resected metastatic sites in 50%. They also reported that 10–45% of teratoma with STM occurred in the metastatic masses even without teratoma in the primary tumor.[15] In the present case, the primary TC did not contain teratoma, but the retroperitoneal mass was teratoma with STM.

The prognosis of teratoma with STM was worse than that of non-seminoma without. According to the International Germ Cell Cancer Collaborative Group classification, the 5-year OS was 96%, 89%, and 67% in non-seminoma patients with good, intermediate, and poor prognosis, respectively.[16] In contrast, the 5-year OS was 69.8%, 49.1%, and 47.9% in good, intermediate, and poor prognosis patients with teratoma with STM, respectively.[17] Even for clinical stage I patients with teratoma with STM, the 5-year OS was 83.4%. Micrometastases were considered to be a cause of the poor prognosis. Giannatempo *et al*. reported that 28 clinical stage I patients with teratoma with STM underwent RPLND, and 10 patients had viable nodal teratoma with STM.[17] In addition, patients with teratoma with STM at LR had a significantly worse prognosis.[14] Chemotherapy had a limited effect on teratoma with STM, and patients with non-resectable lesions might have poor survival. Che *et al*. proposed surgical resection of tumor with LR if a complete resection was feasible in patients with teratoma with STM.[18] In the present case, a mass with teratoma with STM was resected at LR by L-RPLND, and this prevented unnecessary chemotherapy. Moreover, the patient's ejaculatory function was preserved after L-RPLND. Since sexual functioning including ejaculation disorders after RPLND has an impact on sexual activity and health-related quality of life of TC survivors,[19,20] more attention needs to be paid to postoperative sexual functioning if the metastatic mass is resectable.

Conclusion

In the present case, RPLN metastasis of teratoma with STM was resected 18 years after initial treatment by L-RPLND. Early detection and early surgical resection for relapse of teratoma might be effective, suggesting that minimally invasive surgery including L-RPLND might be considered if a mass suspicious of relapse is small and resectable.

Author contributions

Maiko Yamashita: Writing – original draft. Takanari Sakai: Data curation. Shinichi Yamashita: Conceptualization; writing – review and editing. Fumiyoshi Fujishima: Writing – review and editing. Takuro Goto: Data curation. Takuma Sato: Data curation. Yoshihide Kawasaki: Data curation. Naoki Kawamorita: Data curation. Takaki Tanaka: Data curation. Akihiro Ito: Supervision.

Conflict of interest

The authors declare no conflict of interest.

Approval of the research protocol by an Institutional Reviewer Board

The present study protocol was approved by the ethics committee of Tohoku University Graduate School of Medicine (No. 2022-1-668).

Informed consent

Informed consent was obtained from the patient.

Registry and the Registration No. of the study/trial

Not applicable.

References

1 Shintaku I, Satoh M, Okajima E *et al*. Survival of metastatic germ cell cancer patients assessed by international germ cell consensus classification in Japan. *Jpn. J. Clin. Oncol.* 2008; **38**: 281–7.

2 Kojima T, Kawai K, Tsuchiya K *et al*. Identification of a subgroup with worse prognosis among patients with poor-risk testicular germ cell tumor. *Int. J. Urol.* 2015; **22**: 923–7.

3 Yamashita S, Koyama J, Goto T *et al*. Trends in age and histology of testicular cancer from 1980–2019: a single-center study. *Tohoku J. Exp. Med.* 2020; **252**: 219–24.

4 Oldenburg J, Martin JM, Fossa SD. Late relapses of germ cell malignancies: incidence, management, and prognosis. *J. Clin. Oncol.* 2006; **24**: 5503–11.

5 Beyer J, Albers P, Altena R *et al*. Maintaining success, reducing treatment burden, focusing on survivorship: highlights from the third European consensus conference on diagnosis and treatment of germ-cell cancer. *Ann. Oncol.* 2013; **24**: 878–88.

6 Oldenburg J, Berney DM, Bokemeyer C *et al*. Testicular seminoma and non-seminoma: ESMO-EURACAN clinical practice guideline for diagnosis, treatment and follow-up. *Ann. Oncol.* 2022; **33**: 362–75.

7 Moore JA, Slack RS, Lehner MJ *et al*. Very late recurrence in germ cell tumor of the testis: lessons and implications. *Cancers (Basel)* 2022; **14**: 1127.

8 Arai Y, Kaiho Y, Yamada S *et al*. Extraperitoneal laparoscopic retroperitoneal lymph node dissection after chemotherapy for nonseminomatous testicular germ-cell tumor: surgical and oncological outcomes. *Int. Urol. Nephrol.* 2012; **44**: 1389–95.

9 Williamson SR, Delahunt B, Magi-Galluzzi C *et al*. The World Health Organization 2016 classification of testicular germ cell tumours: a review and

update from the International Society of Urological Pathology Testis Consultation Panel. *Histopathology* 2017; **70**: 335–46.
10 Ehrlich Y, Brames MJ, Beck SD, Foster RS, Einhorn LH. Long-term follow-up of cisplatin combination chemotherapy in patients with disseminated non-seminomatous germ cell tumors: is a postchemotherapy retroperitoneal lymph node dissection needed after complete remission? *J. Clin. Oncol.* 2010; **28**: 531–6.
11 Nason GJ, Jewett MAS, Bostrom PJ *et al*. Long-term surveillance of patients with complete response following chemotherapy for metastatic Nonseminomatous germ cell tumor. *Eur. Urol. Oncol.* 2021; **4**: 289–96.
12 Busch J, Schmidt S, Albers P *et al*. Can magnetic resonance imaging replace conventional computerized tomography for follow-up of patients with testicular cancer? A systematic review. *World J. Urol.* 2022; **40**: 2843–52.
13 Spiess PE, Pisters LL, Liu P *et al*. Malignant transformation of testicular teratoma: a chemoresistant phenotype. *Urol. Oncol.* 2008; **26**: 595–9.
14 Rice KR, Magers MJ, Beck SD *et al*. Management of germ cell tumors with somatic type malignancy: pathological features, prognostic factors and survival outcomes. *J. Urol.* 2014; **192**: 1403–9.
15 Necchi A, Colecchia M, Nicolai N *et al*. Towards the definition of the best management and prognostic factors of teratoma with malignant transformation: a single-institution case series and new proposal. *BJU Int.* 2011; **107**: 1088–94.
16 Gillessen S, Sauvé N, Collette L *et al*. Predicting outcomes in men with metastatic nonseminomatous germ cell tumors (NSGCT): results from the IGCCCG update consortium. *J. Clin. Oncol.* 2021; **39**: 1563–74.
17 Giannatempo P, Pond GR, Sonpavde G *et al*. Treatment and clinical outcomes of patients with Teratoma with somatic-type malignant transformation: an international collaboration. *J. Urol.* 2016; **196**: 95–100.
18 Che Y, Lusch A, Winter C *et al*. Late relapsing germ cell tumors with elevated tumor markers. *World J. Urol.* 2022; **40**: 363–71.
19 Koyama J, Yamashita S, Yamada S *et al*. Impact of cancer therapy on post-treatment ejaculation disorder and sexual life in testicular cancer survivors. *Int. J. Urol.* 2021; **28**: 69–74.
20 Yamashita S, Kakimoto K, Uemura M *et al*. Health-related quality of life in testicular cancer survivors in Japan: a multi-institutional, cross-sectional study using the EORTC QLQ-TC26. *Urology* 2021; **156**: 173–80.

