The growing teratoma syndrome (GTS) was first defined in 1982 as growth in masses despite the decrease of serum tumor markers after treatment with cytotoxic chemotherapy in non-seminomatous germ cell tumors. Due to the rarity of the GTS, tumor growth should not be mistaken for disease progression. Because this may cause oncological overtreatment in some patients. GTS is most common in the retroperitoneal region. However, it has been reported elsewhere (lung, lymph nodes, mediastinum, liver, and pineal gland). Since GTS is not responsive to chemotherapy and radiotherapy, the gold standard of treatment is the radical surgical excision of the mass. There are very few cases of GTS in the literature that develop from the supraclavicular lymph node. Here we present an unusual case of GTS at left supraclavicular and subcarinal lymph nodes.

**Keywords:** Growing teratoma syndrome, germ cell tumor, testis tumor.

**Case Report**

We present the case of a 29 year old man who had surgery in 2010 due to undescended left testicle. There was no malign pathology report and any treatment history. In April 2018, the patient admitted to the hospital because of palpable mass in the right testicle. Before surgery alpha fetoprotein (AFP) level was detected as 9.2 ng/mL (normal range 0-5 ng/mL), B-HCG was within normal levels and right partial orchiectomy was performed. Histopathological examination described as mixt germ cell tumor (seminoma %10, embryonal carcinoma %40, yolk sac tumor %10 and teratoma %40), pT2. Tumor was limited to testicular tissue and all surgical margins were intact. But, in-situ neoplasm continues at the parenchymal surgical margin. Abdominal tomography (CT) evaluation showed a few lymph nodes (measuring 7 mm) in the left paraaortic region. Post-operative AFP level was within normal levels (1.6 ng/mL). The patient did not accept total orchiectomy and radiotherapy was given to the right residual testicle (2000 cGy). 2 cycles BEP (Bleomycin, etoposide, cisplatin) was planned after radiotherapy but patient did not accept to receive chemotherapy. After 8 months, in November 2018, he admitted with palpable left supraclavicular lymphadenopathy. AFP was detected as 8.4 ng/mL, B-HCG was within normal levels. Thorax and abdominal to-
mography evaluation showed no abnormal finding in addition to supraclavicular area. Biopsy was performed from left supraclavicular lymph adenopathy. Pathological evaluation reported as metastasis of testicular origin malignancy. The patient was treated with 3 cycles of bleomisin-etoposide-cisplatin (BEP) combination. Despite 3 cycles BEP treatment, post-treatment tomography showed enlargement of the left supraclavicular lymphadenopathy (from 36x27 to 45x28 mm). Re-biopsy was performed and the pathology resulted as a cyst. AFP was undetectable and the patient was planned to follow in a multidisciplinary tumor council. After 4 months of completion treatment left supraclavicular lymph node enlargement lymphadenopathy was continued to grow (from 45x28 mm to 61x47 mm) and newly developed subcarinal lymphadenopathy (24 mm) was detected. The patient’s AFP was still undetectable. Because of the radiologically similar lymphadenopathies, GTS was considered in the foreground. Left supraclavicular lymph node excision was performed (Figs. 1, 2). Pathology was a reported as teratoma. Subcarinal lymph node excision was then performed (Fig. 3). Its pathology result was also reported as a teratoma. The patient is still being followed in remission.

Discussion

GTS is a uncommon clinical condition in patients with germ cell tumors. Most of the diagnosed cases are often in men, because germ cell cancer is more prevalent in men. The prevalence of GTS in metastatic nonseminomatous germ cell tumor is between 2.0% - 7.6% however it may rarely originate from pure seminoma. There is no definitive information about the etiology of GTSs. However, according to the most accepted opinions: The first may be that chemotherapy destroys immature malignant cells and the growth of mature teratomatosis components are not affected with treatment, and the other may be chemotherapy changing cell kinetics and convert some of the malignant cells to benign teratoma transformation.

It is well-known fact that growing teratomas are benign, but they can grow by 0.5–0.7 cm per month, and the volume increase can be between 9.2-12.9 cm³ per month of course, growth trends may vary. It is also difficult to predict the behavior of GTSs in terms of local spread and malignant degeneration.

According to André et al., there are some clues to suggest GTS development: the presence of mature teratoma in the primary NSGCT, no reduction in tumor size during che-
motherapy; and teratoma in postchemotherapy residual masses.[4] Following closely the patient during and after chemotherapy is important. The first sign of GTS may be tumor growth during or after chemotherapy. Usually tumor growth is not accompanied by tumor marker elevation. However, rarely, small increases in tumor markers have been reported.[7] The presence of mature teratoma and absence of viable germ cells in the pathology is another finding that supports GTS.

Since GTS is not responsive to chemotherapy and radiotherapy, the gold standard of treatment is the radical surgical excision of the mass. Delayed surgery can cause local complications (postrenal failure or bowel obstruction, bile duct, or large vessel compression etc.). Therefore, it is recommended to perform surgery as soon as possible. Patients with GTS have heterogeneous clinical outcomes. During follow-up, 4-17% of patients relapse despite surgical complete resection.[8] Median recurrence time was reported as 48 months in one study.[7] In another study, 2 of 22 GTS patients developed recurrence at 2 and 6 months.[9] GTS is most common in the retroperitoneal region. However, it has been reported elsewhere (lung, lymph nodes, mediastinum, liver, and pineal gland).[10, 11] There are very few cases of GTS in the literature that develop from the supraclavicular and subcarinal lymph nodes, is special.

In conclusion, due to the rarity of the GTS, tumor growth should not be mistaken for disease progression. This may cause oncological overtreatment in some patients. Therefore, in the case of tumor growth with normal tumor markers, as in our case, considering GTS is the first and most important part of the treatment.

Disclosures

Informed Consent: Written informed consent was obtained from the parents of the patient for the publication of the case report and the accompanying images.

Peer-review: Externally peer-reviewed.

Conflict of Interest: The authors indicated no potential conflicts of interest.


References