

# MALIGNANT TRANSFORMATION OF GERM CELL TUMOR WITH TERATOMATOUS COMPONENT INTO ADVANCED RETROPERITONEAL SARCOMA - CASE REPORT AND LITERATURE REVIEW

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## ABSTRACT

**Background:** A late-relapse germ cell tumor (GCT) might contain malignant non-germ cell tumor cells, known as „somatic-type malignancy” (SM). Development of secondary SM is extremely rare and occurs in only 1% of patients with GCT.

**Case study:** We present the case of a 42-year-old patient who developed retroperitoneal tumor with duodenal and right colon involvement 6 years after he underwent left orchidectomy for stage IIC mixed GCT (95% seminoma, 5% teratoma). Since the tumor markers for germline tumor were normal, another type of tumor was highly suspected, most likely a malignant alteration of the residual teratoma. Tumor was completely removed and pathological report suggested undifferentiated sarcoma.

**Conclusion:** R0 resection and postoperative patient follow-up by the protocol for at least 6 years after orchidectomy is the key to successful treatment of GCT. Malignant tumor transformations are rare, but still possible so clinicians should be aware of the importance of frequent and adequate patient monitoring.

## Keywords:

sarcoma, retroperitoneal, germ cell tumor

## INTRODUCTION

Testicle is an organ with double function consisting of embryonic and supporting cells. The process of spermatogenesis emerges from the germ cells, while the supporting (Leydig) cells represent an endocrine part of the organ which releases male sex hormone - testosterone. While tumors can originate from both types of cells, tumors of germinal epithelium are far more common [1].

Germ cell tumors represent 95% of all testicular tumors, and are among the most common tumors of young men aged 15 to 34 years. Their incidence has increased in the last 30 years, especially in industrialized countries. Multidisciplinary approach, advance in diagnostic methods, surgical technique and chemotherapy have led to increased survival rate of more than 90% and

20 years ago, that value was mortality rate of this malignancy [2-4].

Seminomas have the best prognosis, while prognosis of non-seminomatous tumors depends on the presence and type of its different components-embryonic carcinoma, teratoma, yolk-sack tumors, choriocarcinoma, and can also be mixed GCT [5,6].

Despite appropriate treatment, 10 to 30% of patients may experience relapse within 2 years after orchidectomy. A very late relapse (over 5 years following orchidectomy) happens even more rarely, in about only 1% of cases, but such tumors often contain malignant cells of non-germinal type (somatic-type malignancy, SM). It is possible that malignant transformation arises either from the pre-existing teratomatous component of the tumor, or from the totipotent germ cell. The most common type of SM associated with GCT is the sarcoma in more than 50% of cases, with rhabdomyosarcoma being its most common subtype. It is followed by neuroectodermal tumors, adenocarcinomas and undifferentiated sarcomas [7-9].

Sarcomas are a heterogeneous group of rare solid tumors of mesenchymal origin with specific clinical and pathological features. They are usually divided into two major categories - soft tissue sarcomas (fat, muscle, nerve and nerve envelopes, blood vessels and other connective tissues) and sarcomas of the bone. Anatomical localization of the tumor process is a very important variable that affects the choice of treatment method and outcome of the disease [7,9].

Accordingly, the NCCN soft tissue sarcoma (STS) guidelines are classified into the following subcategories: STS of extremities, surface / placed on the trunk, head or neck; retroperitoneal or intraabdominal STS; GIST; desmoid tumors (aggressive fibromatosis); rhabdomyosarcomas. STSs most commonly metastasize into the lungs, while abdominal STSs are mainly conveyed in the liver and peritoneum [10].

Due to the rare occurrence and complexity of this condition, an optimal treatment strategy has not yet

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**DOI:** 10.5281/zenodo.3517765

been established. For this reason it is important to involve multidisciplinary teams of experts in treating STS and follow evidence-based recommendations.

### CASE STUDY

A 42-year-old patient has been hospitalized at the Abdominal Surgery Department because of epigastric pain, anorexia, nausea and vomit soon after meal intake. In addition, he had insomnia and night sweating. He had a history of stage IIC mixed testicular carcinoma (95% seminoma, 5% teratoma) which was treated in 2012. He underwent left-sided orchiectomy and had 4 cycles of adjuvant chemotherapy by BEP protocol (bleomycin / etoposide / cis-platinum), followed by retroperitoneal lymph node dissection. Due to iatrogenic urethral injury, left nephrectomy was performed in the same procedure. Thereafter, the patient did not show up for regular urological and oncological follow-ups.

An abdominal CT revealed a large retroperitoneal tumor with compression and partial obstruction of the duodenum. Since tumor markers for germinative tumor were normal, another type of tumor was highly suspected, most likely a malignant alteration of residual teratoma.

Surgery was indicated and included complete extirpation of the retroperitoneal tumor, partial duodenal and jejunal resection with terminolateral duodenojejunal anastomosis, left hemicolectomy and apendectomy. Histopathological suggested undifferentiated sarcoma.

Postoperative course was complicated with infected intraabdominal collection (*E.fecalis*, *C. albicans* and *C. Dubliniensis*), increased inflammatory parameters and elevated liver enzymes (AF 436; GGT 690; AA 161). Antibiotic and supportive therapy with percutaneous drainage of collections was done and patient's condition improved and was discharged on postoperative day 24.

### DISCUSSION

Malignant transformation of germ cell tumors into somatic malignancy is rare clinical scenario and sarcomas are the most commonly reported type of malignancy observed in GCTs. Hypothesis regarding the origin of malignant transformation suggests that the sarcoma may arise from "malignant transformation" of teratomatous mesenchyme [11,13].

Prior to selecting the treatment method for STS, it is necessary to do a biopsy and set a pathohistological diagnosis. The correct diagnosis is very important in primary testicular tumors as well as in the metastases since it will allow appropriate therapy. The most frequently selected method of treatment is the surgical resection of the tumor and all affected structures, and it is of utmost importance that the resection margins are free of malignant tissue. This is the only potentially curative option for patients with retroperitoneal / intraabdominal STS [11,12].

Patients with stage I disease have good prognosis, but in metastatic disease it is generally poor. Radical surgery is the only curative modality, although there have been a couple of findings on achieving promising results with Doxorubicin-based chemotherapy for transformed tumour component [13].

A large study on 500 subjects showed median survival of 103 months for complete resection compared to 18 months for incomplete resection. Radiotherapy can be used as a preoperative procedure in resectable tumors, or as a primary treatment for non-curable ones, but is not appropriate substitute for radical surgical resection [14].

A deeper understanding of the biology of this phenomenon is essential for clinicians who are involved in such malignancies in order to improve treatment outcomes.

### CONCLUSION

R0 resection and postoperative patient follow-up by the protocol for at least 6 years after orchiectomy is the key to successful treatment of GCT. Malignant tumor transformations are rare, but still possible so clinicians should be aware of the importance of frequent and adequate patient monitoring.

### CONFLICT OF INTEREST:

**The authors declare that there is no conflict of interest.**

**The patient gave her informed consent prior to her inclusion in case report.**

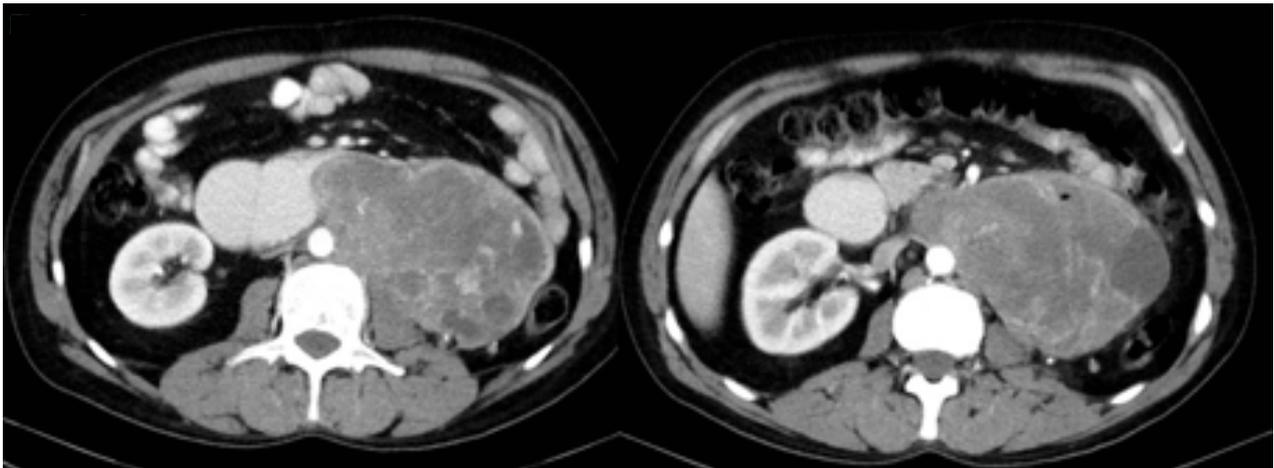
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## FIGURES AND CAPTIONS

**Figure 1.** Abdominal CT scan showing large retroperitoneal tumour mass which caused duodenal obstruction



**Figure 2.** Surgical specimen after “en block” resection of tumor, fourth segment of duodenum and proximal part of jejunum



**Figure 3.** Tumor as seen after the fibrous capsule was partially removed

