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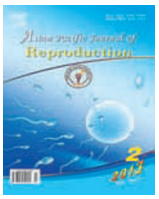

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An old patient with growing teratoma syndrome of the ovary

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ABSTRACT

Growing teratoma syndrome (GTS) is a rare complication of malignant ovarian germ cell tumors. A 52-year old woman was admitted to our Gynecological Oncology Department with metastatic multiple abdominal masses. Her initial gynecological history presented an immature teratoma of the ovary 3 years previously, and she underwent total abdominal hysterectomy, bilateral salpingo-oophorectomy, bilateral pelvic-paraaortic lymphadenectomy and omentectomy. She received three cycles of bleomycin, etoposide and cisplatin (BEP) regimen after surgery. Although the tumor markers were within normal limits, multiple metastatic lesions were detected in the 3rd month of follow-up. The patient was referred to our gynecological oncology department, optimal debulking including resection of the tumoral lesions localized on the liver, diaphragm, peritoneum, sigmoid colon, omentum and retroperitoneum was performed. Histopathology of all samples revealed mature teratoma. This syndrome should be remembered when a tumor is refractory to chemotherapy and growth of the tumor still continues after resection of the initial tumor.

1. Introduction

Immature teratoma of the ovary, representing only 1% of ovarian tumors, is usually seen in women of the first two decades and contains immature neural tissues, the amount of which determines the grade of the tumor [1]. Whereas ovarian cystic teratoma deriving from germ cells are usually seen in women of reproductive age, and most of them are benign, malignant ovarian germ cell tumors are found in adolescent girls and young women [1,2]. Growing teratoma syndrome (GTS) is a rare complication of these malignant tumors and the pathophysiology still remains unknown. Here we present a 52-year old patient as the oldest individual in the literature with GTS secondary to an immature teratoma of the ovary.

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2. Case report

A 52-year old woman was admitted to our Gynecological Oncology Department with metastatic multiple abdominal masses. Her initial gynecological history presented an immature teratoma of the ovary about 3 years previously (Figure 1) and she underwent total abdominal hysterectomy, bilateral salpingo-oophorectomy, bilateral pelvic-paraaortic lymphadenectomy and omentectomy. The level of alpha-fetoprotein (AFP) was 325 ng/mL before the operation and other tumor markers were within normal limits. Histopathological examination confirmed an immature teratoma (grade 3) with immature neuroepithelial tissues and mature-immature components. The patient was diagnosed as having a FIGO (International Federation

of Gynecology and Obstetrics) stage IIIC immature teratoma and she received three cycles of bleomycin, etoposide and cisplatin (BEP) regimen after surgery. The tumor markers AFP, CA-125 and β-human chorionic gonadotrophin were within normal limits after chemotherapy.

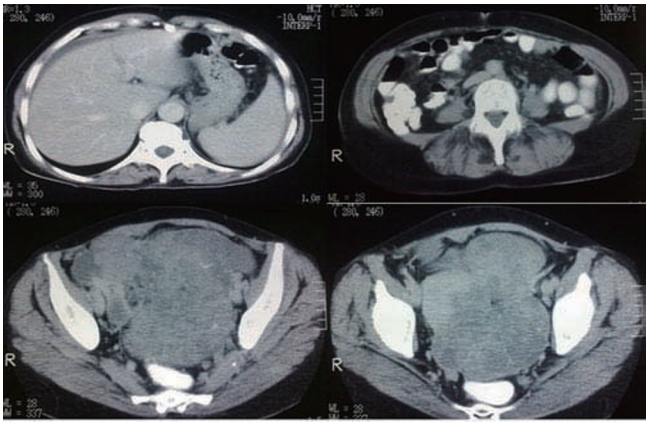

Figure 1. Axial CT images of the left ovarian immature teratoma and perihepatic fluid before the first operation.

Because computed tomography (CT) scan revealed metastatic lesions on the liver and metastatic pelvic lymph nodes, a paracecal soft tissue mass and multiple pelvic masses in the 3rd month of follow-up, the patient received second line chemotherapy with paclitaxel-carboplatin at the outer center (Figure 2). Although AFP and other tumor markers were within normal limits, growth of the tumor and new abdominal, peritoneal metastatic lesions near left iliac vessels were detected via CT in a 1.5-year follow-up. During the three year period in which the patient was followed, she received three more cycles BEP protocol due to a rather slow but progressive enlargement in the outer center. All AFP levels were within normal limits during treatment and follow-up. Three years after the initial surgery, the patient was referred to our Gynecological Oncology Department for further evaluation. The pathologic diagnosis confirmed the prior histopathological result as an immature teratoma. Multiple abdominal masses the largest of which was located on the liver with a diameter of (200×100) mm were diagnosed via abdominal-pelvic magnetic resonance imaging. The AFP level was 3.47 ng/mL before the operation. On exploratory laparotomy, there were tumoral lesions, including right diaphragmatic nodules, liver masses with solid, cystic and calcific components lying from the posteromedial side of the liver to the retroperitoneum, nodules located near the lesser curvature of the stomach, multiple pelvic masses and metastatic lymph nodes. Optimal debulking including resection of the tumoral lesions localized on the liver, diaphragm, peritoneum, sigmoid colon, omentum and retroperitoneum was performed (Figure 3). Histopathology of all samples revealed mature teratoma without any immature components (Figure 3). The patient received no further treatment and CT scan revealed no sign of recurrence at the 1-year follow-up.

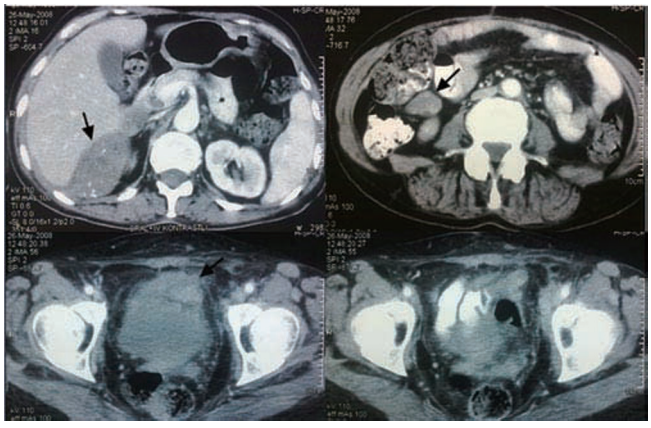

Figure 2. Postoperative 3rd month control CT images; soft tissue masses at different locations, including liver, pelvis and between bowels.

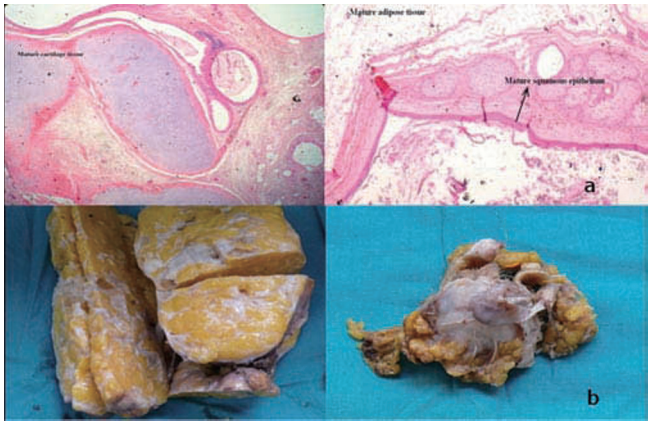

Figure 3. The photograph shows histopathology of the mature teratoma without any immature components (a) and postoperative material of mature teratoma (b).

3. Discussion

In germ cell tumors of the ovary, an uncommon metastatic complication called the 'growing teratoma syndrome' should be kept in mind when clinical or radiological increases in tumor size during or after chemotherapy is determined with normalization of tumor markers and metastases full of pure mature teratoma without any malignant components [3]. The syndrome was first defined in 1982 by Logothetis in Nonseminomatous Germ Cell Tumors of the testis (NSGCT) [4]. The first description in female patients was reported in 1977 with three patients presenting GTS criteria [5]. The incidence was reported to be between 1.9% and 7.5% in NSGCT and 12% in ovarian immature teratoma [4,6].

Although the physiopathology of this term has not been fully understood, two possible theories have been proposed.

One theory suggests malignant cell differentiation into mature components by chemotherapy (chemotherapeutic retroconversion) and the other theory points out selective destruction of malignant components other than mature components by chemotherapy [5]. Although some authors reported that both chemotherapeutic retroconversion and GTS were probably synonymous [7], others pointed out that these terms differed from each other according to the ability to proliferate [8]. Nodules in chemotherapeutic retroconversion do not increase in size whereas mature teratoma nodules in GTS have the ability to proliferate and cause huge masses. Our case demonstrated the characteristics of GTS criteria; tumor markers were within normal limits, clinical and radiological enlargement of masses after chemotherapy was detected and the histopathological evaluation revealed mature teratoma without malignant components.

GTS is most commonly seen in the retroperitoneum (80%) and chest; it has also been described in the supraclavicular lymph nodes, lung, mediastinum, inguinal lymph nodes, mesentery and liver [9]. In our case, tumor masses were seen in several sites including diaphragm, liver, retroperitoneum, stomach and omentum. A serial CT scan revealed features including increased size of mass lesions with internal, linear calcifications, cystic lesions and better circumscribed margins in relation to surrounding tissues.

The age of the patients reported in the literature was between 5 and 38 years [8]. Our case differed from other cases in the literature as far as the age of the patient. Ours was the oldest patient reviewed in the literature, with an age of 52.

While the predicting factors of GTS were reported as the mature teratoma elements in the primary tumor, incomplete resection of the primary tumor and no reduction in tumor size after chemotherapy [10], complete surgical resection should therefore be recommended in all cases and the gold standard treatment for this circumstance is the total removal of all mature teratoma lesions, in order to exclude the risk of malignant transformation and to avoid mechanical compression effects on pelvic and abdominal organs.

In conclusion, the diagnosis of growing teratoma syndrome should be suspected when a tumor is refractory to chemotherapy and the growth of the tumor still continues after resection of the initial tumor. Early suspicion may protect the patient to get unnecessary chemotherapeutic agents and might change the treatment to surgical approach.

Conflict of interest statement

We declare that we have no conflict of interest.

Acknowledgements

All authors have contributed significantly and all authors are in agreement with the content of the manuscript.

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