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Case Report

Laparoscopic Excisional Surgery for Growing Teratoma Syndrome of the Ovary: Case Report and Literature Review

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ABSTRACT Growing teratoma syndrome (GTS) is rare clinical phenomenon occurring as a sequelae of a malignant germ cell tumor. We present the case of a 20-year-old woman who developed GTS after undergoing fertility-sparing surgery and chemotherapy for an immature teratoma. She underwent left salpingo-oophorectomy, right ovarian cystectomy, and disseminated tumor reduction during her primary surgery. The postsurgical histology report identified the tumor as an immature teratoma, grade 3, International Federation of Gynecology and Obstetrics (FIGO) stage IIIb. She subsequently received 3 cycles of chemotherapy consisting of bleomycin, etoposide, and cisplatin. At 17 months after the chemotherapy, follow-up computed tomography (CT) scan revealed an enlarged mass in her right paracolic gutter and a small peritoneal lesion in the pouch of Douglas. Her serum alpha-fetoprotein level was not elevated. These findings were compatible with GTS, but it was difficult to rule out a recurrent immature teratoma. Diagnostic exploratory laparoscopic surgery revealed the enlarged tumors that had been detected by the CT scan. Although there were multiple tumors in the pouch of Douglas, we were able to resect all of them laparoscopically. Histological diagnosis of the surgically resected specimens was of a mature teratoma, and so we concluded that this tumor was a GTS. Our experience suggests that laparoscopic surgery is an effective alternative diagnostic and therapeutic approach in cases suspicious of GTS where the disease is disseminated to the peritoneum. Journal of Minimally Invasive Gynecology (2015) 22, 668–674 © 2015 AAGL. All rights reserved.

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Growing teratoma syndrome (GTS) is rare clinical phenomenon occurring as a result of a malignant germ cell tumor [1]. The syndrome is defined as an increase in the size of a mature germ cell teratoma or the appearance of a new germ cell tumor mass, during or after chemotherapy, with any initially elevated tumor markers all remaining normal [2]. Although GTS is a histologically benign tumor, up to 3% of GTS cases can undergo malignant transformation [3]. Therefore, complete surgical resection of the tumor is desirable [4]. Here we report the results of laparoscopic excisional surgery for a case of GTS with multiple peritoneal dissemination within the pouch of Douglas and a peritoneal implant in the paracolic gutter. Owing to the rarity of GTS, there have been only 3 previous case reports of laparoscopic excisional surgery for GTS; our present case is the fourth.

Case Report

A 20-year-old woman (gravid 0, para 0) was referred to our hospital due to a large ovarian tumor, having complained of abdominal distention for 3 months. Her medical and gynecologic history was unremarkable. The physical examination was normal, except for a large abdominal mass. Trans-abdominal ultrasonography showed a 16-cm solid ovarian tumor and ascites fluid. Serum tumor marker

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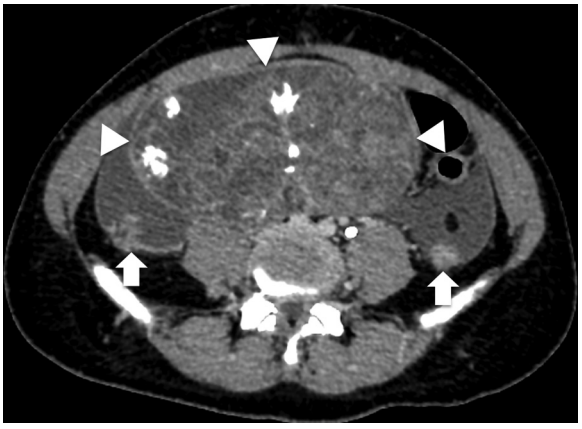
Fig. 1

CT scan showing a pelvic tumor 17 cm in size originating from the left ovary (*arrowheads*) containing calcifications, fatty areas, and peritoneal nodules (*arrows*), implicating peritoneal dissemination.



analysis showed elevated alpha-fetoprotein at 96 ng/mL and elevated CA125 at 728 U/mL. Contrast-enhanced computed tomography (CT) revealed a 17-cm pelvic tumor containing calcifications and fatty areas; it originated from the left ovary and had peritoneal nodules, which implicated peritoneal dissemination (Fig. 1). A left salpingo-oophorectomy was performed, leaving 5 mm of residual disease on the pelvic and upper abdominal peritoneum.

The final pathological analysis revealed a grade 3 immature teratoma of the left ovary, with features of immature tissue, skin, sebaceous glands, neural tissue, cartilage, bone, smooth muscle, and fatty tissue. Mature components and immature glial implants were microscopically revealed in the peritoneum implants (Fig. 2). The peritoneal washing was negative. She was diagnosed with an International Federation of Gynecology and Obstetrics (FIGO) stage IIIb immature teratoma.

Postoperatively, the patient received 3 cycles of chemotherapy consisting of bleomycin, etoposide, and cisplatin. Her tumor markers returned to normal by 4 months after the operation. At 17 months after the primary surgery, a follow-up CT scan showed that the peritoneal lesions had grown to 1 cm and revealed a pelvic lesion of approximately 4 cm on the right paracolic gutter, with internal calcification, fatty areas, and a cystic component (Fig. 3). The tumor marker levels at regrowth were not elevated. A positron emission tomography–CT (PET-CT) scan showed uptake of fluoro-2-deoxy-D-glucose in the peritoneal lesion (SUV 2.5). Based on this limited information, we could not differentiate between a case of GTS and a recurrent immature teratoma.

After thorough counseling, the patient consented to laparoscopic surgery and excision of the lesions. Laparoscopic surgery revealed a 5-cm-diameter tumor at the lateral edge of the ascending mesocolon and additional 0.5- to 1-cm nodules in the pouch of Douglas (Fig. 4A). The uterus, right ovary, and oviduct were normal. All of these lesions were resected laparoscopically (Fig. 4B). The histology report revealed that the largest tumor was composed of mature cartilage, neural tissue, skin, and sebaceous glands; thus, the tumor was diagnosed as a mature teratoma (Fig. 5). No immature elements or viable carcinoma were seen in any of the sections studied.

The patient has been on follow-up every 3 months with imaging and tumor marker analysis. She resumed menstruation at 3 months after the operation, and has exhibited no subsequent evidence of disease for 12 months.

Discussion

GTS is a benign germ cell tumor that appears to be induced to grow after chemotherapy for a malignant tumor [5]. The pathogenesis of GTS has remained controversial. Two mechanisms have been proposed: (1) Chemotherapy induces the disappearance of any malignant cells, leaving behind the mature teratoma components, or (2) the benign

Fig. 2

Histological examination of the tumor of the first laparotomy showing immature teratomatous elements (*arrow*). (Hematoxylin and eosin; original magnification: A, 2×; B, 10×.)