Original research article

Mature Ovarian Teratoma and Gliomatosis Peritonei: an Uncommon Case Report

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Abstract

Gliomatosis peritonei (GP) is a rare condition characterized by benign glial implants in the peritoneum, omentum, and lymph nodes, typically associated with immature ovarian teratomas and less frequently with mature teratomas. We present a case of a 21-year-old woman with severe abdominal pain and a large abdominal mass. Imaging revealed a large multilocular cystic mass suggestive of a dermoid cyst with torsion. During exploratory laparotomy, a large cystic mass with hair, teeth, and sebaceous material was found in the left ovary, alongside multiple nodules in the omentum. A left salpingo-oophorectomy, omentectomy, and peritoneal biopsies were performed. Histopathology confirmed a mature teratoma with GP. The patient's postoperative period was uneventful, and no adjuvant therapy was required. This case underscores the importance of recognizing GP in patients with ovarian teratomas, highlighting the typically benign nature and favorable prognosis of GP with proper surgical management.

Keywords: Gliomatosis peritonei, Mature ovarian teratoma, Benign glial implants, Ovarian tumor

Introduction

Teratomas can occur at any age but are most common in individuals aged 20–40. Mature cystic teratomas, the most frequent germ cell tumors of the ovary, account for 10%–20% of all ovarian tumors.Gliomatosis peritonei (GP) is a rare condition characterized by the presence of benign glial implants in the peritoneum, omentum, and lymph nodes. It is typically associated with immature ovarian teratomas and less frequently with mature teratomas. Despite extensive peritoneal involvement, GP does not generally worsen the prognosis, even when linked with immature teratomas. Most patients with ovarian teratomas and GP survive without requiring adjuvant radiotherapy or chemotherapy, particularly those with grade I primary tumors and grade 0 glial implants.[1] There is no consensus on the treatment and follow-up for GP, though clinical data have reported recurrence, malignant transformation, metastasis, and even spontaneous regression.[2]Here, we present a case of mature ovarian teratoma associated with GP.

Case Report

A 21-year-old unmarried woman with a regular menstrual cycle presented to the emergency department with severe abdominal pain and a noticeable abdominal lump

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that had been present for two months. On physical examination, she exhibited tachycardia, though the rest of her vital signs were stable. Abdominal examination revealed a tender, palpable mass approximately 16-18 cm in size, which was cystic to solid in consistency and mobile from side to side. Examination of other systems was grossly normal. Ultrasonography Doppler of the abdomen revealed a large multilocular cystic mass measuring 16 cm × 18 cm, with an internal solid component, multiple septae, calcificationand fat component in the abdominopelvic region, with an absence of blood flow suggestive of dermoid cyst with torsion. Despite being given analgesics, her pain was not relieved.An emergency exploratory laparotomy was plannedgiventhe acute abdomen.

During the laparotomy, 100 ml of free fluid was found in the peritoneum and sent for cytology. A huge multiloculated cystic mass with a smooth, glistening surface and an intact capsule, measuring about 16 x 14 x 6 cm, was discovered from the left ovary (**Figure 1**). The cut section of the mass revealed hair, teeth, and sebaceous material (**Figure 2**). Multiple nodules were present in the omentum, but no similar lesions were found in the peritoneal cavity, liver, gallbladder, spleen, or diaphragm. The right ovary was bulky, while the bilateral tubes and uterus appeared normal. The retroperitoneal lymph nodes were not enlarged intraoperatively.

A fertility-preserving left salpingo-oophorectomy, along with omentectomy and multiple peritoneal biopsies, was performed. The final histopathological report of left ovarian mass indicated mature tissue derived from all three germ layers, including stratified squamous epithelium, skin appendages, glial tissue, adipose tissue, salivary glands, bony tissue, cartilage, and choroid plexus. No immature components were observed. Sections from the omentum nodules showed mature glial tissue, which was positive for GFAP on immunohistochemistry, and the peritoneal fluid was negative for malignancy (**Figure 3**). These findings were indicative of a mature teratoma of the ovary with gliomatosis peritonei.The patient's postoperative period was uneventful, and no adjuvant therapy was required. She

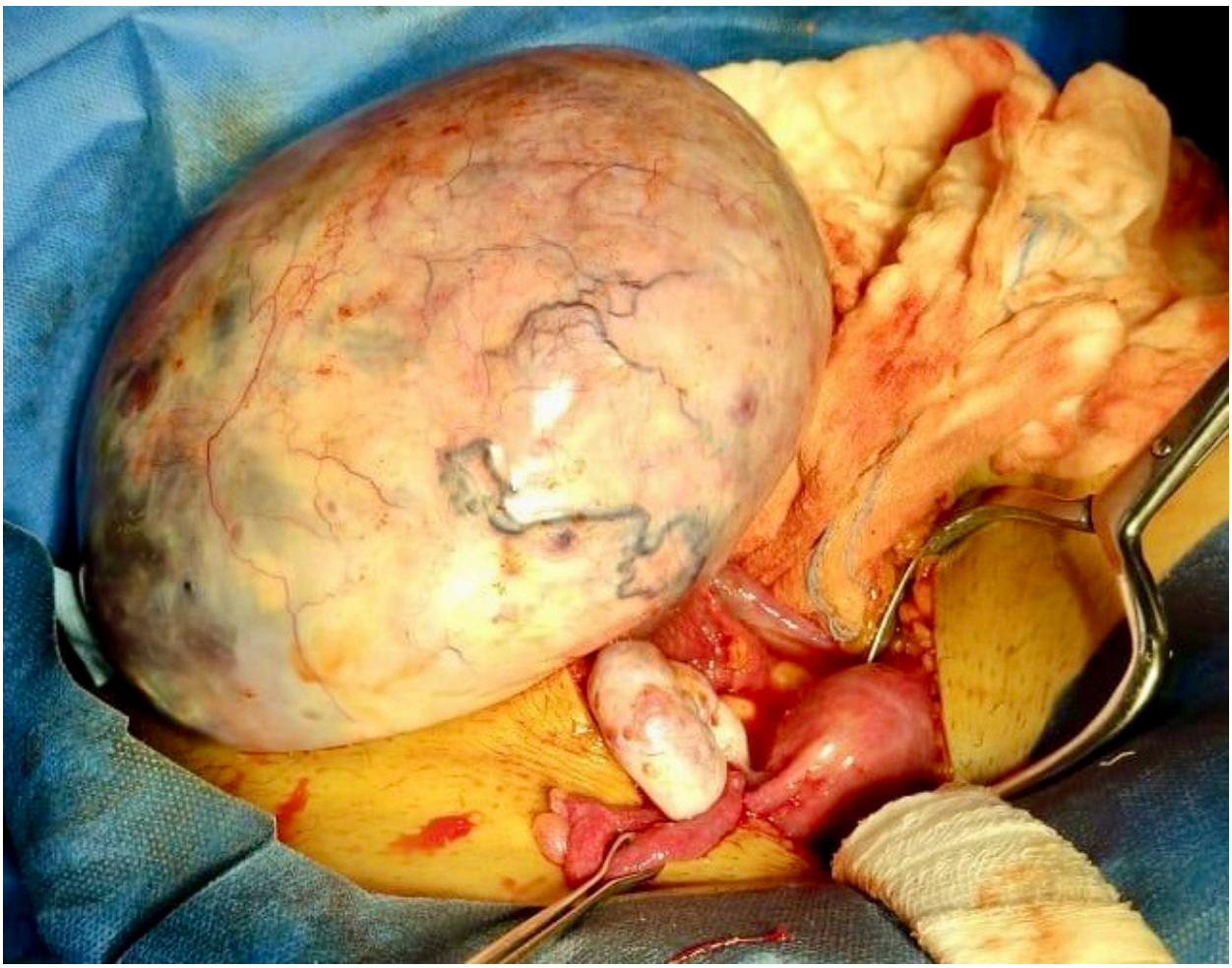

Figure 1- A multiloculated cystic mass with a smooth, glistening surface and an intact capsule, measuring about 16 x 14 x 6 cmarising from the left ovary,the right ovary was bulky, while the bilateral tubes and uterus appeared normal.

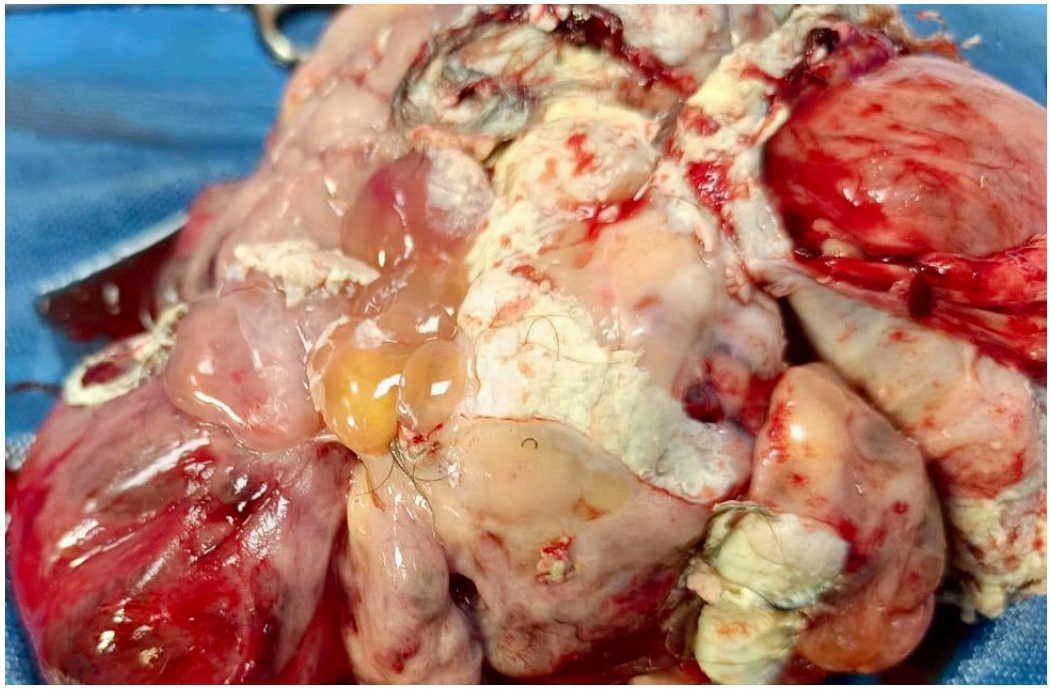

Figure 2- The cut section of the left ovarian mass revealed hair, teeth, and sebaceous material

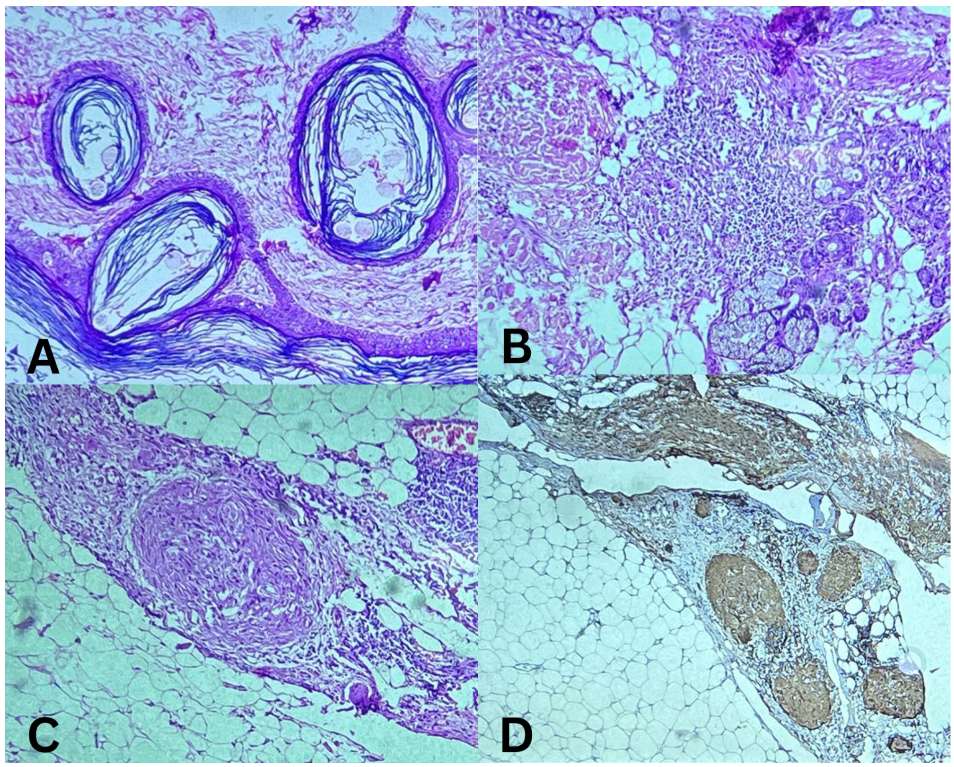

Figure 3- A-Dermoid cyst lined by stratified squamous epithelium, B- cyst containing adipose tissue, nerve bundle and salivary gland, C- omentum showing mature glial tissue, D- Omental glial tissue immunoreactive for GFAP.

is currently on regular follow-up.

Discussion

Gliomatosis peritonei (GP) is defined as the metastatic implantation of mature glial tissue on the peritoneum, omentum, and abdominal lymph nodes without other teratomatous components, and is considered a benign process.[3] Clinically, these small, greyish-tan nodules may be mistaken intraoperatively for ovarian carcinomas or peritoneal tuberculosis. GP is a rare condition, typically associated with solid ovarian teratomas, and most commonly occurs in the second decade of life.[4]

The origin of gliomatosis peritonei (GP) remains uncertain, with two primary theories proposed. One suggests that glial tissue implants in the peritoneum either through the rupture of the ovarian teratoma capsule, leading to implantation of teratomatous tissue, or via lymphatic spread similar to carcinoma metastasis. The other theory posits pluripotent stem cells in the peritoneum or adjacent mesenchyme undergo glial metaplasia.[5] In our case, the ovarian teratoma capsule was intact, and the peritoneal fluid contained no malignant cells.

In imaging, mature cystic teratomas range from pure cystic masses to complex solid cystic masses, with the presence of intratumoral fat being a key diagnostic feature.[6] In our case, imaging revealed a heterogeneously enhancing mass with calcification and fatty components in the pelvic cavity, suggesting an adnexal teratoma. Due to the small size and numerous nature of glial tissue, they are often difficult to identify via ultrasound, limiting its role in diagnosing gliomatosis peritonei (GP), as seen in our case.

Grossly, glial tissue implants are 1–10 mm in size, usually less than 3 mm, and lack fatty components, making them indistinguishable from tuberculous peritonitis and peritoneal carcinomatosis. Diagnosis is therefore made through histopathological examination. Omental caking and ascites may also be present in some cases. In our case, numerous nodules were found in the omentum, but none were present in the peritoneal cavity, liver, gallbladder, spleen, or diaphragm. The diagnosis of GP was confirmed through histopathological examination of the deposits.[7]

Gliomatosis peritonei (GP) is considered a grade 0 teratoma and typically has a favorable prognosis, managed conservatively. Complete resection is often challenging due to the extensive nature of the lesions. However, residual GP deposits are usually asymptomatic and inert over time or may eventually disappear. Treatment decisions are based on the grade of the primary tumor rather than the glial tissue implants, provided these implants are thoroughly sampled and confirmed to be mature.[8]

If immature glial tissue or other teratomatous components are found in the peritoneum or omentum, treatment should follow protocols for metastatic ovarian teratoma. In our case, the patient underwent fertility-preserving surgery for the mature ovarian teratoma, along with an omentectomy which confirms the presence of a mature glial component and multiple peritoneal biopsies. Despite the excellent prognosis for patients with gliomatosis peritonei (GP), long-term follow-up is recommended due to cases of malignant transformation of glial components occurring long after initial surgery. Fluoro-deoxy-glucose Positron emission computerised tomography (FDG PET/CT), commonly used to assess residual masses after treatment for germ cell carcinoma, could be valuable for GP follow-up. However, due to the rarity of GP, there are no widely accepted guidelines for the duration and follow-up methods. Our patient remains under regular follow-up.[9]

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Funding – None

Ethical clearance- Not required

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