Case Study

Struma Ovarii with Follicular Thyroid Carcinoma Ovary – A Rare Case Report

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Abstract

Struma ovarii (SO) is a rare ovarian tumor, constituting 1% of all ovarian tumors and 3% of ovarian teratomas, predominantly composed of thyroid tissue. While typically benign, SO can undergo malignant transformation. We report a case of a 41-year-old woman with a six-month history of abdominal distention. Imaging revealed a solid cystic mass in the right adnexa with ascites and elevated CA125 levels. The surgical intervention included a hysterectomy and bilateral salpingo-oophorectomy, with pathology confirming strumaovarii with follicular thyroid carcinoma. Postoperative recovery was uneventful, and all follow-up tests were normal. This case underscores the diagnostic challenge posed by SO due to its resemblance to ovarian cancer and highlights the importance of thorough exploration, pathological examination, and long-term follow-up. Serum thyroglobulin levels can be an effective marker for monitoring tumor recurrence. Our findings contribute to the understanding and management of SO with malignant transformation.

Keywords: Struma ovarii, Follicular thyroid carcinoma, clinical manifestation, treatment

Introduction

Struma ovarii (SO) is a rare ovarian tumor, accounting for 1% of all ovarian tumors and 3% of ovarian teratomas. It is characterized by having over 50% mature thyroid tissue, though it can sometimes include serous or mucous adenocytes. While most SOs are benign, about 5% can be malignant, with papillary and follicular thyroid carcinomas being the most common types. SO typically occurs unilaterally in women aged 40 to 60 and is usually asymptomatic, often discovered incidentally through abdominal ultrasound (US) or computed tomography (CT). When symptoms do occur, they are nonspecific and may include a palpable abdominal mass, ascites, abdominal pain, or irregular menstrual cycles. Due to its rarity, there are no established diagnostic or treatment guidelines. Generally, benign unilateral tumors are managed with surgical resection.[1]The combination of strumaovarii, marked ascites, and elevated CA125 presents a diagnostic challenge, often resembling ovarian cancer clinically and on imaging. Differentiating it from malignancy is further complicated by its multicystic nature with a

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solid component and accompanying massive ascites. Meigs' syndrome, characterized by benign solid ovarian tumors with ascites and pleural effusion, resolves post-tumor resection.[2] Similar clinical presentations in other benign pelvic tumors are termed pseudo-Meigs' syndrome.[3] Here, we present a case of strumaovarii with malignant transformation to follicular thyroid carcinoma with gross ascites and elevated CA125 levels, alongside a review of relevant literature.

Case Report

A 41-year-old woman, para 2, presented to our institution with a six-month history of abdominal distention. On general physical examination, there were no signs of weight loss, tachycardia or thyroid gland enlargement. Abdominal examination was suggestive of massive ascites. Abdominal Contrast-enhanced Magnetic resonance imaging (CEMRI) revealed a 9×7.3×6 cm solid cystic mass in the right adnexa with gross ascites (**Figure 1**). A chest computerised tomography (CT) scan showed no abnormalities, and serum CA125 level was elevated at 350 U/mL. Preoperative thyroid function tests were normal. Ascitic tapping before surgery yielded cell block cytology results suggesting no evidence of malignancy. Given the findings of a solid cystic ovarian mass and elevated CA125, there was a strong suspicion of malignancy, leading to the decision for staging laparotomy.

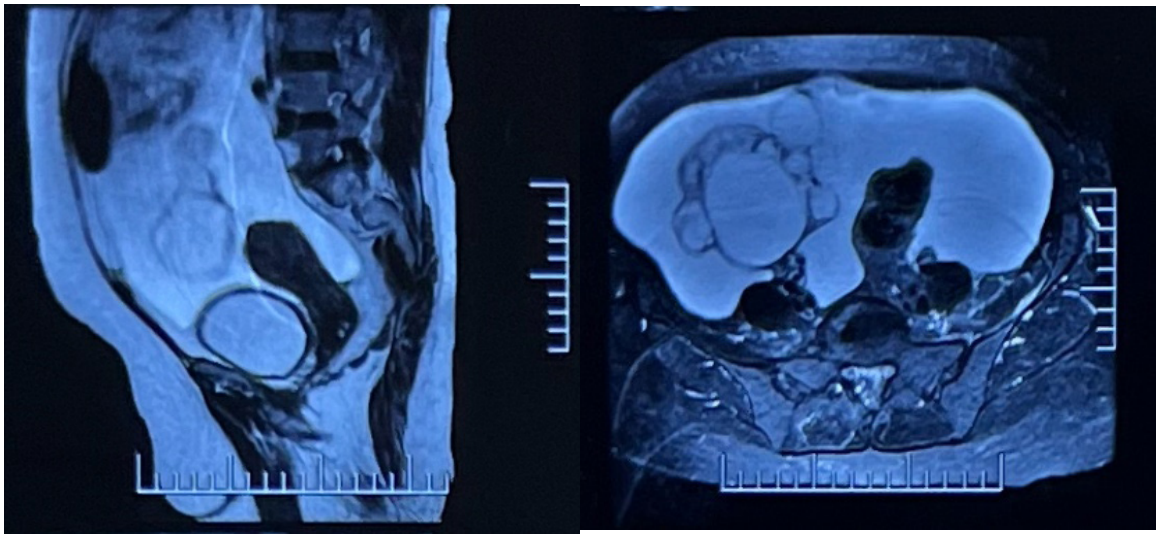

Figure 1: T2 weighted image of MRI suggestive of right adnexal 9×7.3×6 cm solid cystic mass with gross ascites

During laparotomy, 3.5 litres of straw-colored ascites were drained, revealing a normal uterus and left adnexa, and an 8×7×7 cm cystic-solid mass in the right adnexa (**Figure 2**). No intraperitoneal metastasis or retroperitoneal adenopathy was observed. The right adnexa was removed, and frozen section analysis suggested a diagnosis of strumaovarii. Subsequently, a hysterectomy and left salpingo-oophorectomy were performed. Final pathology confirmed Struma ovarii with follicular thyroid carcinoma confined to the right ovary, with tumor tissue positive for CK7, TTF1, and thyroglobulin and negative for CD 56. The uterus, left ovary, and fallopian tubes showed no histological abnormalities. Cytology of ascitic fluid was negative for malignant cells.The postoperative period was uneventful, and the patient was discharged in good condition. She was advised to undergo thyroid function tests, serum thyroglobulin level assessments, and a whole-body positron emission computerised tomography (PET-CT) scan. All results were within normal limits. The patient is currently under close follow-up.

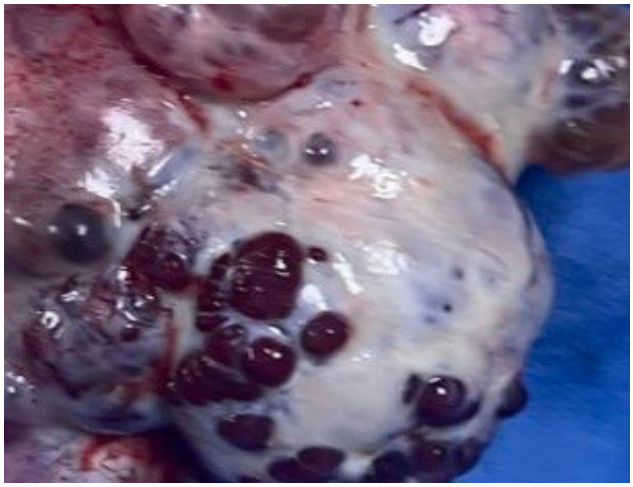

Figure 2: Right adnexa 8×7×7 cm cystic-solid mass

DISCUSSION

Mature cystic teratomas constitute approximately 20% of all ovarian tumors, with about 15% containing thyroid tissue. Struma ovarii (SO) is a monodermal variant of ovarian teratoma, primarily composed of thyroid tissue (>50%), and accounts for 2.5–5% of ovarian teratomas. The papillary type (70%) is more common than the follicular type (30%).[4] Histology in this case revealed a benign follicular struma. SO typically occurs in women aged 40 to 60, usually presenting as a unilateral adnexal mass, often involving the left ovary. Over 92% of SO patients are clinically and biochemically euthyroid, with less than 8% experiencing mild and subclinical hyperthyroidism.[5]Our patient had a normal thyroid function test and right adnexal mass. One-third of strumaovarii patients exhibit concurrent ascites, a condition termed pseudo-Meigs' syndrome.[6]

The ascites and pleural effusion are typically serous, with hypoproteinemia being exceedingly rare, unlike malignant processes. Tumor size, rather than histologic type, appears to be a more significant factor in ascites formation. The etiology of ascites and pleural effusion remains uncertain, with theories suggesting peritoneal irritation and pelvic lymphatic obstruction by the solid pelvic tumor. Additionally, increased peritoneal pressure from ascites may induce peritoneal inflammation, releasing toxins and inflammatory factors exacerbating the condition.[7]

Diagnosing strumaovarii preoperatively solely through imaging poses a challenge, as distinguishing it from ovarian carcinoma can be difficult.

MRI findings often reveal multicystictumors with solid components exhibiting high signal intensity on T1-weighted imaging (T1-WI) and varying signal intensities on T2-weighted imaging (T2-WI) based on fluid viscosity. The solid components typically show moderate to high signal intensity on T1-WI. Despite these imaging characteristics, preoperative diagnosis of strumaovarii remains elusive, with definitive diagnosis typically achieved through postoperative pathological examination.[8] In our patient, the right ovarian tumor presented as a multicystic mass with an irregular thickened septum and a solid component, resembling ovarian carcinoma. MRI revealed slightly high signal intensity on T2-WI and contrast enhancement in the solid component, alongside ascites.

CA125 levels in strumaovarii patients varied widely, ranging from 120 to 5218 U/mL. The exact cause of elevated CA125 remains unclear, but it is believed to originate from mesothelial cells rather than the tumor itself. Mechanical irritation and inflammatory response from the tumor and ascites can upregulate CA125 expression in adjacent mesothelial cells.[9]

Benign strumaovarii is treated with adnexectomy on the affected side. If there are benign implantations, lesion resection is also performed. For follicular carcinoma originating from strumaovarii, treatment involves total hysterectomy and bilateral adnexectomy with resection of metastatic foci. Patients with recurrence or metastasis may consider total thyroidectomy with Iodine-131 adjuvant therapy.[10]Careful exploration should be conducted during the operation for strumaovarii, with all samples undergoing pathological examination. Long-term close follow-up is essential postoperatively. Serum thyroglobulin can serve as a marker for detecting tumor recurrence after surgery.[10]

Conclusion

The follicular carcinoma originating from strumaovarii is prone to recurrence and metastasis. The microscopic morphological characteristics and immunohistochemistry analysis enhanced our understanding of the pathological features of both ovarian and thyroid follicular carcinoma. This experience deepened our knowledge of the etiology, diagnosis, biological behavior, and prognosis of follicular carcinoma originating from strumaovarii.

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Conflict of Interest: Nil

Informed consent was taken from the patient for publication.

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