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A Rare Case Report of Struma Ovarii in MCH, Al Ahsaa

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Abstract

Struma ovarii is a benign ovarian tumor primarily constituted of thyroid tissue, mostly arising during the reproductive years. The condition is asymptomatic and often diagnosed accidentally. The case report aimed to describe the clinical features, investigations, and management of a 28-year-old Saudi female with an ovarian mass on the right side. The patient had no other medical or surgical background and complained of pain in the abdomen. An Ultrasound examination and Magnetic Resonance Imaging showed a multiple cystic lesion, indicating an ovarian tumor. Higher scores of CA-125 further supported the malignancy. Laparotomy followed by cystectomy was done without risking ovarian function or fertility. Pathological examination of the resected tissue confirmed the diagnosis of benign struma ovarii, and there was no lymph node metastasis or thyroid disease. Upon follow-up examination, CA-125 returned to baseline, and the thyroid profile tests were normal. A follow-up ultrasound showed no lesions at 6 months. Therefore, this case demonstrates the diagnostic challenges related to struma ovarii. It also stresses the use of advanced imaging techniques and the role of surgery in identifying and dealing with the condition. Struma ovarii should be included in the differential diagnosis of ovarian lesions and should be suspected in young females complaining of non-specific symptoms.

Keywords: Struma ovarii, Ovarian teratoma, CA-125, Thyroid tissue, Ovarian cyst.

Introduction

One of the rarest kinds of ovarian tumors is Struma Ovarii (SO), primarily consisting of more than 50% thyroid tissue.1 The worldwide prevalence of SO is still unidentified due to its rare occurrence, spreading silently. This ovarian tumor reports less than 1% of ovarian tumors, 3% of ovarian teratomas, and less than 0.1% of cases occurring within mature teratomas [1, 2]. Most of the SO is an asymptomatic benign tumor, and around 5-10% is a malignant tumor consisting of papillary and follicular carcinoma [3]. The condition is usually diagnosed incidentally during routine ultrasound examination. The condition is typically asymptomatic or may present with pain in the abdomen and abnormal tissue in the pelvic region. The patient's clinical manifestations overlap with symptoms of ovarian cancer, and patients with distant metastases, such as in the liver, lungs, and bone, often show visible symptoms [4].

The symptoms are challenging to identify based on clinical or imaging criteria. In 5–8% of the cases are presented with symptoms similar to hyperthyroidism due to ectopic thyroid tissue and goiter, whereas SO, marked ascites, and increased CA125 are not common [5]. The diagnosis is confirmed through histopathology of the excised ovarian mass, demonstrating thyroid tissue within the ovary [6]. The gene mutation in the Mature Struma Ovarii (MSO) differs from thyroid cancer [7].

The treatment plan is based on the symptoms and malignancy of the tumor. In the cases of benign tumors, a surgical approach involving cystectomy or salpingo-oophorectomy is suggested [8]. In the cases of distant metastasis, most surgeons tend to perform local surgery, followed by supportive therapy involving total thyroidectomy and radioactive iodine 131 (I-131) therapy [9]. A pre-surgical antithyroid drug is often suggested in patients to manage thyrotoxicosis, including methimazole or propylthiouracil [10]. Post-operative monitoring is essential to evaluate recurrence, imaging, and thyroglobulin levels in long-term surveillance, particularly for malignant conditions [11].

Several research gaps have been found in past literature, such as the mechanism of pathogenesis, which is still unclear. Another limitation is the lack of modern imaging approaches in demarcating SO from other ovarian diseases. Moreover, the existing studies are based on isolated case

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reports, which leads to insufficient data and outcomes.
The current case report aimed to present a rare occurrence of SO in a 28-year-old female at MCH in Al Ahsa. The novelty of the case report lies in that this case brings attention among physicians to this rare pathology and emphasizes the significance of identifying and managing such patients effectively.

Case presentation

A 28-year-old Saudi female, single, presented with a huge ovarian mass and was referred to a maternity and child hospital in Al Ahsaa. The patient had a known case of sickle cell trait, had no surgical history, had menarche at the age of 13 years with a regular cycle, and the vital signs of the patient were normal. Physical examination reveals pelvic mass around 24 weeks dominant in the right side and tender on palpation.

Ethical Consideration

Documented consent was obtained from the patient to publish this case report and accompanying images. All ethics were considered, protecting the patient's identity, profile, and photo.

Laboratory Test

Laboratory tests, including serum tumor marker cancer antigen-125 (CA-125), were performed, which showed elevated levels at 66 UI/mL (reference values < 35 UI/mL), raising the suspicion of ovarian neoplasm.

Radiology Examination

Ultrasound of the pelvic region showed a right large complex multiloculated cystic mass sizing 14 x 8.5 cm. The cyst comprised various-sized compartments, with the largest sizing 11.4 x 8.2 cm. The fluid inside the cyst showed different echogenicity, presenting a stained appearance. The ultrasound revealed a firm central section with calcification and small polypoidal abnormal growths consisting of calcifications. In addition, a small functional-looking cyst of 22 x 18 mm was observed in the left ovary 22 x 18 mm, whereas the right ovary was normal. Minimal ascites were present, as illustrated in the Figure. 1
Magnetic Resonance Imaging (MRI) of the pelvic region utilizing IV contrast showed a large right adnexal tubular cystic structure. The mass is 10 x 13.7 cm with incomplete internal septations extending to the midline. It presented focal high T1 and low T2 signals, representing hydrosalpinx with a possible component of hematosalpinx, as shown in Figure. 2

Surgical Outcomes

Exploratory laparotomy was performed on the patient, and a well-demarcated, huge right ovarian cyst sizing approximately 10cm*14cm was identified. The cyst was carefully dissected to avoid damage to the right ovary, as illustrated in Figure. 3. The uterus, left ovary, left and right tube, and rest of the peritoneal cavity represented a normal macroscopic appearance. The surgical specimen was subsequently sent to the pathology department for histopathological assessment so that the condition could be diagnosed accurately.

Histopathological Evaluation

Histopathological examination reported a multilocular cystic structure of 15cm x 14cm x 10cm. The outer surface appeared smooth, greyish, and shiny. The cyst is multilocular and contains firm yellowish-brownish colloid- material. There was no sign of solid lesion or

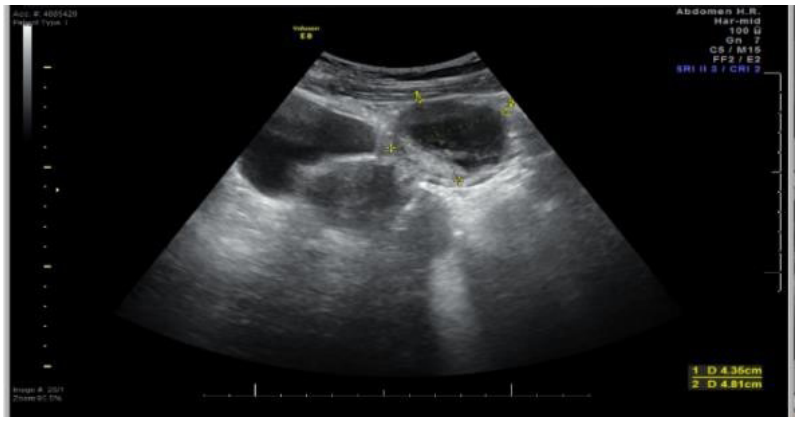

Figure.1: Large Complex Multiloculated Cystic Mass (Pelvic Ultra Sound).

papillary projections. Representative sections submitted in four blocks (A-D) confirmed SO.

Post-operative care and follow-up

The patient was discharged home on the third postoperative day in a good generalized condition. On the 3rd post-surgical week, the patient's condition had improved significantly. The repeated laboratory tests showed that the CA-125 serum level and thyroid function test were within the normal ranges. No mass was detected on ultrasound. The patient was asymptomatic, with good general condition when identified and examined after 6 months of the follow-up. No abnormal mass was identified in pelvic ultrasound.

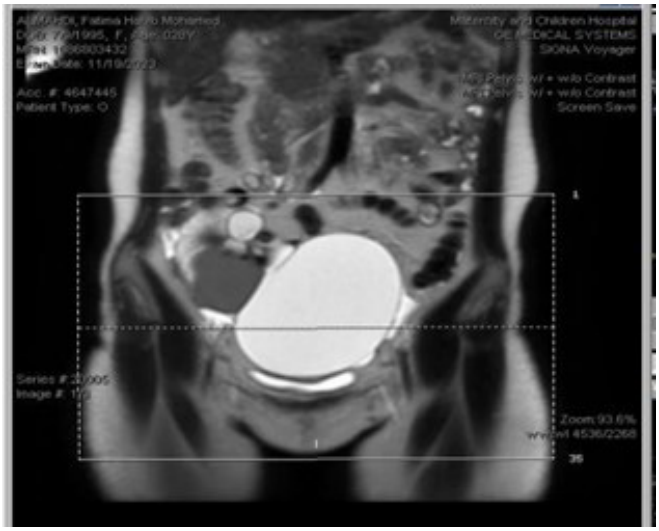

Figure. 2: Large Right Adnexal Tubular Cystic Structure (Pelvic MRI with IV contrast)

Figure. 3: Multicyclic and Smooth Surface and Sections (Surgical specimen)

Discussion

SO is an ovarian teratoma containing mainly thyroid tissue, constituting 1% of all mature teratomas [12]. This is commonly seen in premenopausal women, and the symptoms involve infiltrating carcinoma to hyperthyroidism. Imaging and histopathology are involved in diagnosis, and surgical resection of the tumor is the main form of treatment [13].

The patient in the present case report is 28 years old, but this difference was insignificant. The SO is uncommon at an age lower than 30; however, rare case reports of such a condition exist, meaning that age cannot be used as a criterion in diagnosing the condition [14]. The results reported a slightly higher prevalence of tumors involving the right ovary, similar to the current case report.

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Bilateral involvement is documented in very few cases, approximately 6%; however, in the current case, unilateral presentation is consistent with this age group [15-17].

Although it is estimated that 40% of affected patients are asymptomatic, other symptoms include acute abdominal pain, suspected ascites, irregular bleeding, hyperthyroidism, or pseudo-Meigs syndrome [18, 19]. In the present case, the absence of systemic symptoms, pleural effusion, or massive ascites indicates a benign tumor. It has been reported that pseudo-Meigs' syndrome involving patients with effusion and ascites can be occasionally observed, but this phenomenon was not encountered in the given case. This demonstrates the range of clinical presentations and adds to the importance of imaging in detecting those who are mainly asymptomatic [20]. The failure to diagnose pseudo-Meigs' syndrome seen in 5% of cases and hyperthyroidism in 5–8% of patients speaks in favor of an early benign tumor. This underscores the heterogeneous SO and the diagnostic difficulties in the incidentally detected, minimally symptomatic patient [21].

The CA-125 is slightly above normal in the present case report; however, its specificity and sensitivity rate in detecting ovarian tumors are not very high. CA125 has 71-82% sensitivity and 75-94% specificity in diagnosing ovarian or other gynecological malignant tumors [1]. Li et al.(2023), in their study, mention that elevated CA-125 levels could be detected in other gynecologic and non-gynecologic malignancies, thus reducing the specificity of this biomarker as a sole marker of SO [22]. Imaging proved significant since USG and MRI provided clear pictures of multiloculated cystic masses with septations and fluid components. Similarly, in a study by Yamauchi et al. (2023) on diagnostic imaging, SO has been described as cystic masses with one or more compartments of solid thyroid tissue [23]. In metastasis of malignant SO, about 6-7% is disseminated to adjust pelvic organs, including the contralateral ovary; moreover, the right ovary gets MSO more than the left ovary, and Just 6% of MSO patients have a bilateral tumor [24].

In this case, performing histopathology as the gold standard confirmed benign SO, as demonstrated in the literature. On microscopy, numerous multilocular cysts filled with colloids consistent with benign thyroid tissue were seen. According to Rahma et al. (2022), histopathological characters with colloid-filled cysts and lack of nuclear atypicality or vascular invasion distinguish benign SO. These results illustrate the importance of surface biopsy, particularly when imaging characteristics of various types are ambiguous [25]. Microscopic features of benign SO are presented with multiple cysts of different sizes filled with colloids. Conversely, malignant SO usually arises as a well-differentiated thyroid tumor with "ground glass" nuclei, hypermitotic activity, and/or vascular invasion. In malignant cases, thyroid imaging must rule out metastasis to the thyroid gland [26].

Current therapeutic approaches to SO reported in the literature consist of surgical intervention management because it depends on the patient's age, fertility status, and type of tumor. This cystectomy can be considered appropriate caution with young patients with benign tumors who have the desire to preserve fertility. On the other hand, in malignant conditions, more complex procedures are likely to be performed, such as bilateral salpingo-oophorectomy or total abdominal hysterectomy [9]. Research by Li et al. (2023) also corroborates the conservative approach used in this case, stating that benign SO have a low risk of recurrent surgery if sufficient surgery has been done. This follow-up strategy, which includes CA-125 measurement and pelvic imaging, is probably appropriate, although no standard follow-up guidelines exist for benign disease [27].

Notably, there is a lack of preoperative diagnostic accuracy, as SO could be diagnosed only after the operation. This limitation is not unique to the present study, as the literature also reveals that preoperative differentiation of ovarian masses into benign or malignant still poses diagnostic difficulties. Imaging and tumor markers aid diagnosis but rarely serve as definitive preoperative diagnoses due to this reason. Further research should be done to refine the diagnostic pathways with or without including molecular markers or better imaging to improve the preoperative prediction of the results.

The main advantages of this case report are detailed diagnostic workup, the approach to surgical management, and follow-up, which contribute to a better understanding of the management of SO. The case report exhibits the following limitation: exclusion of preoperative TSH level, T3, and T4 and absence of PET/CT scan imaging to exclude malignancy.

Conclusion

A SO is an uncommon ovarian tumor, and its link to elevated CA-125 levels and hyperthyroidism is exceptionally rare. The treatment of this condition typically involves complete surgical removal of mass. Diagnosing SO based solely on clinical symptoms or imaging

studies can be difficult due to its varied presentations. A definitive diagnosis is achieved only through postoperative histopathological examination.

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