MEIGS' SYNDROME IN A YOUNG PATIENT: A CASE REPORT

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Meigs syndrome is a rare benign condition defined by the triad of a benign ovarian tumor, ascites, and pleural effusion, which resolve after tumor removal. It commonly occurs in postmenopausal women and may mimic malignancy due to elevated CA-125 levels and fluid accumulation. It is extremely rare in females under 30. A 17-year-old girl presented with a palpable lower abdominal mass, without fever or weight loss. CT scan revealed a 110×70 mm pelvic mass, ascites (53 mm), bilateral pleural effusion, and elevated CA-125 (340.8 U/mL). Exploratory surgery and frozen section biopsy confirmed a benign ovarian fibroma. Only the affected adnexa were removed, preserving reproductive organs. Symptoms resolved completely after surgery. Meigs syndrome should be considered even in young patients with ovarian masses and effusions. Timely surgery with intraoperative frozen section is crucial for diagnosis and fertility-preserving treatment.

Keywords: Ascites, Meigs syndrome, Ovarian fibroma, Pleural effusion.

I. INTRODUCTION

Meigs' syndrome is a rare clinical condition characterized by the triad of: (1) a benign ovarian tumor (typically a fibroma), (2) pleural effusion (most commonly on the right side), and (3) ascites, with both the pleural effusion and ascites resolving after removal of the tumor.[1] Ovarian fibromas account for 2–5% of all surgically resected ovarian tumors, and Meigs' syndrome is observed in approximately 1% of these cases, most commonly affecting postmenopausal women, with the highest incidence seen in women in their 70s.[2] Ovarian tumors are exceedingly rare in girls, with an estimated incidence of approximately 2.6 cases per 100,000 girls per year. Among these, fibromas represent only 0.7–1.9%.[3] Indeed, a review of the medical literature reveals that reports and studies on Meigs' syndrome in young patients are exceedingly scarce, with only a few isolated case reports published worldwide.[4,5] Although Meigs' syndrome is a benign condition, it may be misdiagnosed as a malignant ovarian tumor due to the presence of pleural and peritoneal effusions or elevated CA-125 levels, potentially leading to vastly different treatment approaches and prognoses.[6] We report a case of Meigs' syndrome in a 17-year-old female patient and provide a literature review on diagnosis and management, emphasizing appropriate clinical decision-making in young patients due to fertility considerations. All collected data from patients' medical records were used solely for research purposes, and patient confidentiality was strictly maintained, and all personal information was anonymized to protect privacy. This case report has been

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reported in line with the SCARE Criteria.[7]

II. CASE PRESENTATION

We report the case of a 17-year-old female patient with no prior medical history who presented with a palpable lower abdominal mass, accompanied by right-sided chest pain and exertional dyspnea. On physical examination, a firm, mobile, and mildly tender mass measuring approximately 10×7 cm was detected in the hypogastric region, with a smooth surface. Laboratory investigations revealed an elevated CA-125 level of 340.8 U/mL.

Pleural ultrasound showed right pleural effusion measuring 42 mm and left pleural effusion of 21 mm, both homogenous in appearance (Figure 1). Abdominal ultrasonography evaluating the uterus and adnexa demonstrated a uterus and left ovary of normal size. A solid mass with homogeneous echotexture, smooth margins, and well-defined borders was identified in the hypogastric region, measuring 117 × 72 × 97 mm, and was clearly demarcated from adjacent organs (Figure 2). Contrast-enhanced abdominal computed tomography (CT) revealed a relatively well-defined pelvic mass measuring 110 × 70 mm, with mild pre-contrast hyperdensity and poor post-contrast enhancement. No enlarged regional lymph node or evidence of active bleeding pseudoaneurysm was noted in the arterial phase. Free fluid was observed around the liver, spleen, and intestinal loops, with the thickest accumulation measuring 53 mm (Figure 3).

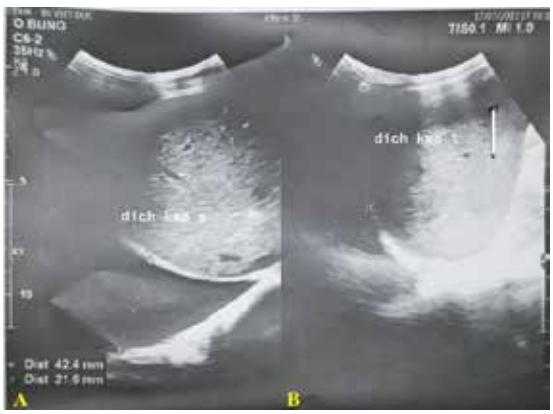

Figure 1. Right-sided (A) and left-sided (B) pleural effusions on pleural ultrasonography.

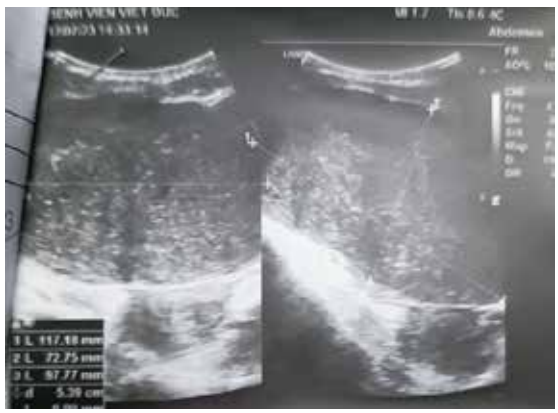

Figure 2. A hypogastric mass measuring 117 × 72 × 97 mm on abdominal ultrasonography.

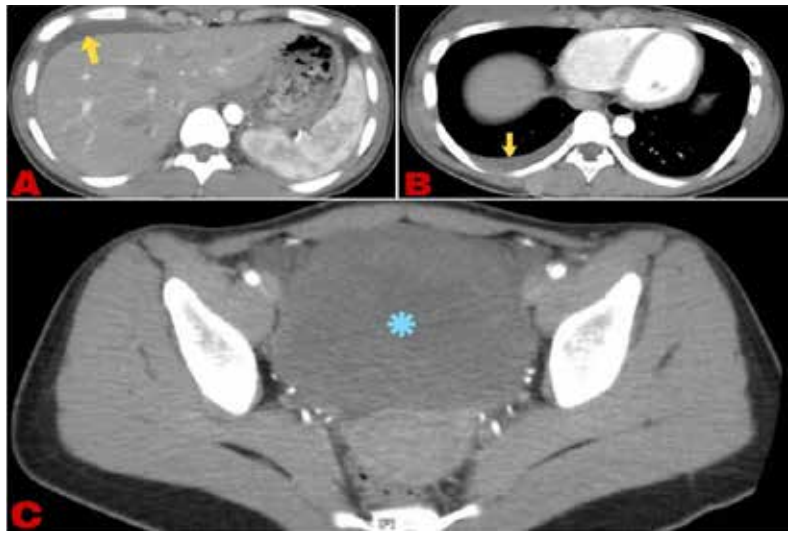

Figure 3: Axial contrast-enhanced thoracoabdominopelvic computed tomography (CT) scan showing free fluid (yellow arrows) around the liver (A) and in the right pleural space (B), along with a pelvic mass (C) (blue snowflake).

Magnetic resonance imaging (MRI) demonstrated a left ovary measuring 33 × 12 mm, while the right ovary was not visualized. A mass measuring 132 × 78 mm was seen anterior to the uterus, with clear margins separating it from the uterus and a well-defined, regular border. The central portion of the mass showed high signal intensity on T2-weighted images with no post-contrast enhancement, consistent with necrosis. The peripheral portion was hypointense on T2, isointense on T1 relative to adjacent structures, showed marked diffusion restriction on DWI, and demonstrated poor post-contrast enhancement-suggestive of a fibrous tumor. Free fluid in the pelvis and bilateral iliac fossae measured up to 27 mm (Figure 4).

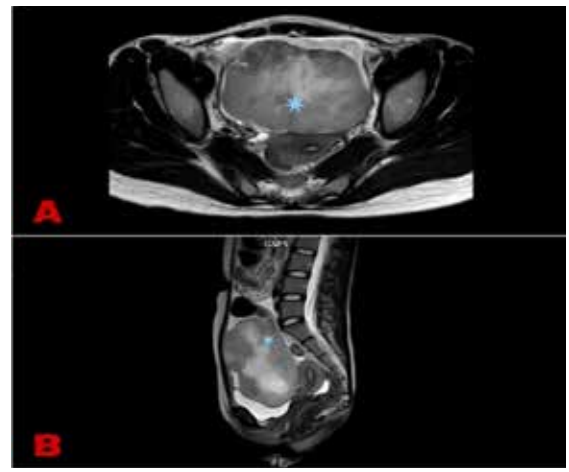

Figure 4: Pelvic mass (blue star) visualized on axial (A) and sagittal (B) magnetic resonance imaging (MRI) scans of the abdomen

The patient was preoperatively diagnosed with a right ovarian tumor, classified as O-RADS 3 according to the American College of Radiology (ACR) system.[8] She underwent open surgery due to the large size and firm consistency of the tumor. Intraoperative findings included approximately 200 mL of serous ascitic fluid and a right ovarian tumor measuring 10 × 15 cm. The tumor was mobile and showed no evidence of invasion into adjacent organs. Normal ovarian tissue on the right was not identifiable (Figure 5). Intraoperative frozen section biopsy of the right ovarian tumor revealed an ovarian cortical fibroma. Postoperative histopathological examination, performed seven days later, confirmed a cellular fibroma of the ovary. (Figure 6). Complete resection of the right ovarian tumor was performed with preservation of the uterus, left adnexa, and the unaffected ovary. The patient had an uneventful postoperative recovery and was discharged on postoperative day seven. At 6-month and 1-year follow-ups, there was no evidence of recurrence.

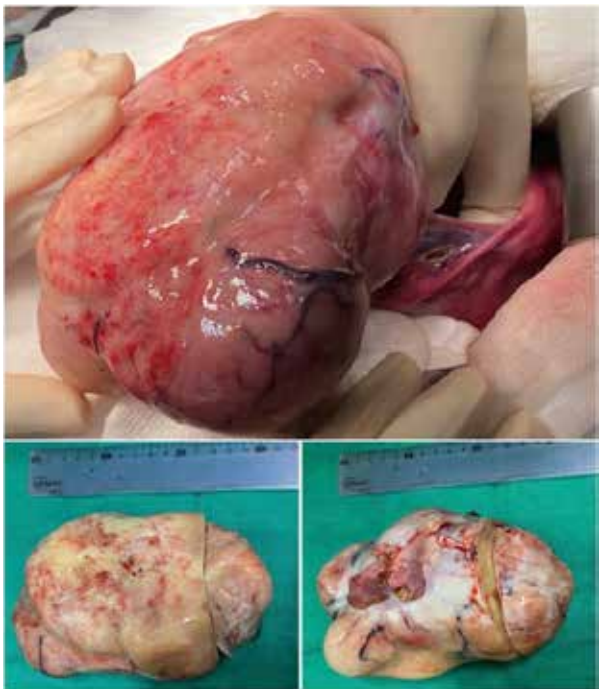

Figure 5. Intraoperative view of the right ovarian tumor

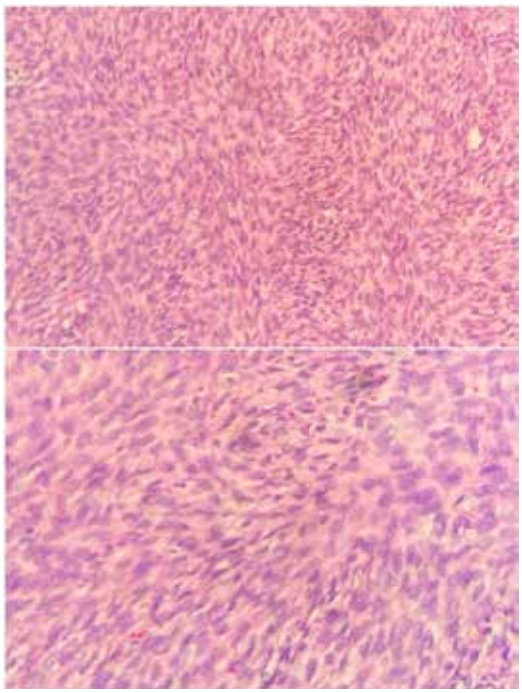

Figure 6. Histopathological findings consistent with a cellular ovarian fibroma

III. DISCUSSIONS

Meigs' syndrome was first described in 1937 in Boston by Joe Vincent Meigs and colleagues, based on seven cases of ovarian fibromas associated with ascites and pleural effusion.[1] In 1954, Meigs redefined the syndrome, proposing four diagnostic criteria for its identification. Other benign ovarian tumors, uterine leiomyomas, and metastatic tumors involving the ovaries that present with pleural effusion are classified under the term Pseudo-Meigs syndrome.[9] Additionally, pericardial effusion is not included in the classical definition of Meigs' syndrome; however, there have been reports of patients with unexplained persistent pericardial effusion

that resolved following resection of a benign ovarian tumor.[10]

The pathophysiology of ascites and pleural effusion in Meigs' syndrome remains incompletely understood. Several hypotheses have been proposed. Meigs himself suggested that ascites results from lymphatic obstruction caused by pressure from the tumor, and that ascitic fluid then migrates into the pleural cavity.[4] Other theories propose that ascitic fluid may pass into the peritoneal cavity through cystic spaces of the ovarian tumor, and subsequently into the pleural cavity via diaphragmatic defects or lymphatic channels. Hormonal stimulation, tumor torsion, and increased production of vascular endothelial growth factor (VEGF), which increases capillary permeability, have also been implicated.[11] Nonetheless, there is currently no consensus regarding the exact pathophysiological mechanism of the syndrome.

Ovarian fibromas account for 2–5% of all surgically resected ovarian tumors, and Meigs' syndrome is found in approximately 1% of these cases. It occurs most commonly in postmenopausal women, with the highest incidence in those around 70 years of age.[2] Although a few cases in 4 to 9 years old children have been reported, Meigs' syndrome is exceedingly rare in women under 30. Among the 84 cases described by Meigs, only 5 patients (5.9%) were 30 years old or younger, with the youngest being 20 years old. Differentiating fibromas from other pelvic masses should be carefully considered; in Meigs' study, 84 out of 124 cases were related to fibrous tumors. In girls under 16 years of age, ovarian fibromas are even more uncommon, accounting for only 4 out of 992 (0.004%) ovarian tumors in Huffman's study.[12]

Given the extremely low incidence of this syndrome in younger patients, it is important to consider *Gorlin syndrome* (nevoid basal cell carcinoma syndrome)-a rare multisystem autosomal dominant disorder caused by mutations in the PTCH1 gene-in the differential diagnosis.[13]

Diagnosis

Clinical examination is a crucial first step in diagnosing Meigs' syndrome. Any female patient presenting with signs of ascites and pleural effusion should undergo a thorough pelvic examination to assess for the presence of a pelvic mass. Simultaneously, laboratory tests should be performed to differentiate Meigs' syndrome from other conditions that can cause pleural effusion and ascites, such as heart failure, liver cirrhosis, or renal failure. These tests also help guide optimal surgical management. Elevated serum CA-125 levels have been reported in several cases of Meigs' syndrome, although this biomarker is typically associated with malignant ovarian tumors. Consequently, patients with an adnexal mass and elevated CA-125 are frequently misdiagnosed with ovarian cancer.[6]

Additionally, pleural and ascitic fluid analyses provide valuable diagnostic information. The Rivalta test and microbiological studies, especially for tuberculosis in patients with suggestive symptoms or risk factors, are particularly useful.[10]

Imaging modalities also play an important role in the diagnostic process. Chest radiography is useful in identifying pleural effusion and assessing for pulmonary metastases or malignancies to exclude Meigs' syndrome. Abdominal and pelvic ultrasound serves as an initial tool to evaluate abdominal and pelvic organs, particularly for detecting small lesions. Contrast-enhanced abdominal computed tomography (CT) can further

characterize the nature and properties of the mass and help rule out other differential diagnoses of ascites and pleural effusion, such as primary pulmonary lesions, cirrhosis-related ascites, or gastrointestinal malignancies with metastases.[14]

Positron emission tomography-computed tomography (PET/CT) provides a comprehensive assessment, offering precise anatomical localization and metabolic information about the suspected lesion. In Meigs' syndrome, ovarian fibromas typically appear as homogeneously solid masses on CT with mild 18F-FDG uptake on PET imaging. In contrast, granulosa cell tumors often present as heterogeneous soft-tissue masses on CT, frequently accompanied by calcifications and/or cystic changes, with higher 18F-FDG uptake on PET. For patients with suspected gastrointestinal malignancy, upper and lower endoscopy should be performed to rule out gastric or colorectal cancer.[15]

Meigs' syndrome cannot be definitively diagnosed until surgical resection of the tumor is performed and histopathological analysis confirms the nature of the lesion. Meigs' syndrome can be further classified into several subtypes based on clinical and pathological criteria.[6]

- *Classic Meigs' syndrome:* Meets all four diagnostic criteria: (1) a benign ovarian fibroma or fibroma-like tumor (such as a thecoma, granulosa cell tumor, or Brenner tumor); (2) ascites; (3) pleural effusion; and (4) complete resolution of ascites and pleural effusion after tumor removal.

- *Non-classical Meigs' syndrome and Demons-Meigs syndrome:* Characterized by ascites and pleural effusion associated with benign tumors of the ovary, fallopian tube, or broad ligament, other than those typically seen in classic Meigs' syndrome.[16]

- *Atypical or incomplete Meigs' syndrome:* Involves only one of the two fluid accumulation -either ascites or pleural effusion - associated with a pelvic or abdominal tumor.[6]

- *Pseudo-Meigs syndrome:* Describes cases of ascites and pleural effusion in patients with pelvic or abdominal tumors that do not meet the histologic or anatomic criteria for Meigs' syndrome. This condition is further classified into benign and malignant forms of Pseudo-Meigs syndrome.[9]

- *Pseudo-pseudo Meigs syndrome (Tjalma syndrome):* Refers to the triad of ascites, pleural effusion, and elevated serum CA-125 levels in patients with systemic lupus erythematosus.[14]

Differential diagnoses should be thoroughly considered and excluded before surgical intervention. Key conditions include: (1) ovarian carcinoma; (2) gastrointestinal or pulmonary malignancies; (3) cirrhosis, congestive heart failure, or nephrotic syndrome; (4) tuberculosis; and (5) Gorlin syndrome - a hereditary cancer syndrome that should be considered in young patients.

Our patient met all four of the clinical criteria mentioned above; however, her CA-125 level was relatively elevated, and therefore malignancy could not be excluded preoperatively. Intraoperative frozen section analysis and postoperative histopathological examination of the ovarian mass confirmed a diagnosis of ovarian fibroma, thereby establishing the diagnosis of classic Meigs' syndrome.

Treatment

The management of Meigs' syndrome can be divided into symptomatic treatment and definitive surgical intervention. Symptomatic treatment includes thoracentesis and paracentesis in patients with significant pleural effusion and

ascites, aimed at relieving symptoms and improving patient comfort. However, surgery remains the mainstay of treatment due to its definitive and curative nature.

Laparoscopic exploration with intraoperative frozen section biopsy of the ovarian mass is the preferred approach, as it allows for accurate histopathological diagnosis and guides subsequent management. If the frozen section confirms a benign tumor, fertility-sparing surgery may be performed, such as unilateral oophorectomy or salpingo-oophorectomy. In women of reproductive age, unilateral oophorectomy is typically indicated. For postmenopausal women, options may include bilateral salpingo-oophorectomy with or without total hysterectomy, depending on the individual case. In prepubertal girls, surgical options include wedge resection or unilateral salpingo-oophorectomy.[15]

As originally described by Meigs, ascites and pleural effusion typically resolve spontaneously within weeks to months after removal of the pelvic mass, with no recurrence.[1] Chest ultrasonography is superior to chest radiography in monitoring the resolution of pleural effusion, as it can detect minimal residual fluid as little as 3–5 mL.[6] Serum CA-125 levels also normalize postoperatively.[15]

In our case, the patient underwent an open laparotomy via a midline infraumbilical incision due to the large size of the tumor. Intraoperative findings revealed normal peritoneal and visceral organs, with the tumor showing no invasion into adjacent structures. Intraoperative frozen section confirmed the diagnosis of an ovarian fibroma. Given the patient's young age and nulliparous status, fertility preservation was prioritized. The surgical approach consisted of tumor excision along with unilateral salpingo-oophorectomy. The patient's pleural effusion resolved completely postoperatively without recurrence.

Our study contributes additional data to the limited literature on younger patients and provides insights into early diagnosis and treatment strategies that prioritize fertility preservation. However, as this is a single-case report, comparisons between different treatment approaches are not possible, and the follow-up period is limited, precluding assessment of long-term outcomes, particularly regarding reproductive function.

Meigs' syndrome is a benign condition with an excellent prognosis when diagnosed and treated early. Postoperative life expectancy in patients with Meigs' syndrome is comparable to that of the general population.[17] Surgical cure rates are high, and recurrence is rare.

IV. CONCLUSIONS

Meigs' syndrome is a rare condition, and clinicians should consider it in all female patients presenting with a pelvic mass, pleural effusion, ascites, and elevated CA-125 levels, in order to ensure timely and accurate diagnosis and appropriate treatment decisions. Prompt recognition can alleviate symptoms and significantly improve patient quality of life. Surgical intervention remains the preferred and definitive treatment approach. Further multicenter studies and pooled case analyses are needed to optimize diagnostic strategies and establish evidence-based management guidelines for this rare condition in young patients.

CONFLICTS OF INTEREST

There are no conflicts of interest to declare.

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REFERENCES

1. Meigs JV, Cass JW. Fibroma of the Ovary with Ascites and Hydrothorax: With a Report of Seven Cases. *American Journal of Obstetrics & Gynecology.* 1937; 33(2): 249-267.

2. Peparini N, Chirletti P. Ovarian malignancies with cytologically negative pleural and peritoneal effusions: demons' or meigs' pseudo-syndromes? *Int J Surg Pathol.* 2009; 17(5): 396-397.

3. Birbas E, Kanavos T, Gkrozou F, Skentou C, Daniilidis A, Vatopoulou A. Ovarian Masses in Children and Adolescents: A Review of the Literature with Emphasis on the Diagnostic Approach. *Children (Basel).* 2023; 10(7).

4. Shiau CS, Chang MY, Hsieh CC, Hsieh TT, Chiang CH. Meigs' syndrome in a young woman with a normal serum CA-125 level. *Chang Gung Med J.* 2005; 28(8): 587-591.

5. Sharayu M, Ava D, Bijal P, Shilpa P, Priti R. A Rare Case of Meigs Syndrome in Pregnancy. *Indian J Gynecol Oncolog.* 2019; 17(37).

6. Krenke R, Maskey-Warzechowska M, Korczynski P, et al. Pleural Effusion in Meigs' Syndrome-Transudate or Exudate?: Systematic Review of the Literature. *Medicine (Baltimore).* 2015; 94(49): e2114.

7. Sohrabi C, Mathew G, Maria N, et al. The SCARE 2023 guideline: updating consensus Surgical CAse REport (SCARE) guidelines. *Int J Surg.* 2023; 109(5): 1136-1140.

8. Andreotti RF, Timmerman D, Strachowski LM, et al. O-RADS US Risk Stratification and Management System: A Consensus Guideline from the ACR Ovarian-Adnexal Reporting and Data System Committee. *Radiology.* 2020; 294(1): 168-185.

9. O'Flanagan SJ, Tighe BF, Egan TJ, Delaney PV. Meigs' syndrome and pseudo-Meigs' syndrome. *J R Soc Med.* 1987; 80(4): 252-253.

10. Okuda K, Noguchi S, Narumoto O, et al. A case of Meigs' syndrome with preceding pericardial effusion in advance of pleural effusion. *BMC Pulm Med.* 2016; 16(1): 71.

11. Nguyen P, Yazdanpanah O, Schumaker B. Meigs' Versus Pseudo-Meigs' Syndrome: A Case of Pleural Effusion, Ascites, and Ovarian Mass. *Cureus.* 2020; 12(8): e9704.

12. Latta RJ, Lee PD. Meigs' syndrome in a young woman. *J Adolesc Health Care.* 1981; 1(4): 313-315.

13. Scalia AC, Farulla A, Fiocchi F, Alboni C, Torricelli P. Imaging features of uterine and ovarian fibromatosis in Nevoid Basal Cell Carcinoma Syndrome. *J Radiol Case Rep.* 2018; 12(9): 21-30.

14. Torres Jimenez AR, Solis-Vallejo E, Cespedes-Cruz AI, Zeferino Cruz M, Rojas-Curiel EZ, Sanchez-Jara B. Tjalma syndrome (pseudo-pseudo Meigs') as initial manifestation of juvenile-onset systemic lupus erythematosus. *Reumatol Clin (Engl Ed).* 2019; 15(5): e41-e43.

15. Lessnau K-D, Anariba DEI, Lanza J, Ali MO, Kanaparthi LK, Chavda R. Meigs Syndrome Treatment & Management. Medscape. https://emedicine.medscape.com/article/255450-treatment#d9. Updated Sep 26, 2024. Accessed Octorber 7, 2024.

16. Brun JL. Demons syndrome revisited: a review of the literature. *Gynecol Oncol.* 2007; 105(3): 796-800.

17. Saha S, Robertson M. Meigs' and Pseudo-Meigs' syndrome. *Australas J Ultrasound Med.* 2012; 15(1): 29-31.