Serous cystadenoma with massive ovarian edema. A case report and review of the literature.

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Summary

Background: Massive ovarian edema is an usual tumour-like condition. It may be confused with an ovarian neoplasm. *Case*: A 13-year-old female in premenarchy was referred as emergency case to a local hospital due to acute, severe and persistent hypogastric pain. She had noticed a gradual abdominal enlargement, mainly on the right abdomen during the last months. Ultrasound revealed a mass of a non-echogenic cystic compartment of 13 cm maximum diameter, and an area of mixed echogenicity of 11 cm maximum diameter at the anatomic site of the right ovary. The CA- 125 levels were increased. An unilateral salpingo-oophorectomy was performed. The pathology examination revealed serous cystadenoma with massive ovarian edema. *Conclusions*: Conservative treatment and ovarian suspension may be more appropriate, when histology on frozen section suggests a benign lesion.

Key words: Massive ovarian edema; Serous cystadenoma; Ovarian neoplasm.

Introduction

Massive ovarian edema (MOE) is a rare, benign entity. It affects one or, rarely, both ovaries and is characterised by accumulation of edema fluid in the stroma. Although the exact mechanism of this condition is not known, at least two well-justified hypotheses have been set forth. It is supposed that MOE is usually a result of partial torsion due to a predisposing factor causing the underlying pathology. Few cases of ovarian lesions, benign or malignant, associated with MOE have been reported. In this article, we present the case of MOE with serous cystadenoma in a 13-year-old female, along with the pathologic, radiologic and laboratory findings and a review of the literature.

Case Report

The patient was a 13-year-old premenarcheal female. She was admitted to the local hospital due to acute, severe and persistent hypogastric pain. She had noticed a gradual asymmetric abdominal enlargement for a few months and described it as a firm and well outlined mass. She had no other symptoms up to that time. Her past medical and surgical history was unremarkable. There was no significant family history, except for a trait of thalassemia. Physical examination revealed a large, firm, abdominal mass tender on palpation, extending from the pubis to 2-3 cm above the umbilicus. The patient's abdomen was peripherally soft and painless in palpation. There was no rebound sign or guarding on the right lower hypogastrium. The liver and spleen were not palpable. Her secondary sex characteristics were well developed. Clinical diagnosis was that of a large adnexal mass. Abdominal ultrasound (US) revealed pelvic masses, probably arising from both ovaries. The patient was referred to "Attikon" University Hospital for further evaluation and treatment, while her symptoms were in remission.

The following examinations were performed:

Complete blood count and blood analysis, blood coagulation tests, serum electrolytes, urine analysis and liver, thyroid and kidney function tests, electrocardiogram and chest X-ray. As the possibility of malignant neoplasia could not be excluded, tumor markers and hormone examinations were performed, according to the protocols of our department. Transabdominal sonography and magnetic resonance imaging (MRI) of the upper and lower abdomen were performed to clarify the texture, structure and location of the masses.

The blood count, biochemical examinations and thyroid hormones were within normal values. Sex hormone profile and tumour markers were also within normal values except for a slightly raised CA-125. Chest X-ray was normal. Extrarenal pelvis was diagnosed by US in the left kidney.

US of the lower abdomen revealed a mass with a cystic area 13 cm in diameter and a mixed area of 11 cm in the maximum diameter at the anatomic site of the right ovary. This particular mass dislocated the uterus to the left. The uterus appeared normal in shape and size.

MRI examination revealed a mass 13 x 9 x 10.5 cm in size, located in the pouch of Douglas, arising from the right ovary. It displaced the uterus to the front-right and the rectum backwards. The mass had a thin wall, intermediate signal intensity on T1-weighted MRI and slightly high signal intensity on T2-weighted MRI, with many internal diaphragms, without amplification. It was presumed that it was full of protein and possibly mucous content. Near the lesion, the space towards the right hypochondrium was occupied by a second cystic mass, 13 x 9 x 10.5 cm in size, pressing the vena cava. This lesion was full of aqueous content. The uterus appeared normal in shape and size. Multiple ovarian follicles were noted at the cortex of both ovaries. The left ovary was enlarged (almost 5 cm in maximum diameter) compared to normal size, according to the patient's age. There was a small quantity of free fluid in the pouch of Douglas. No

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Fig. 1

Fig. 2

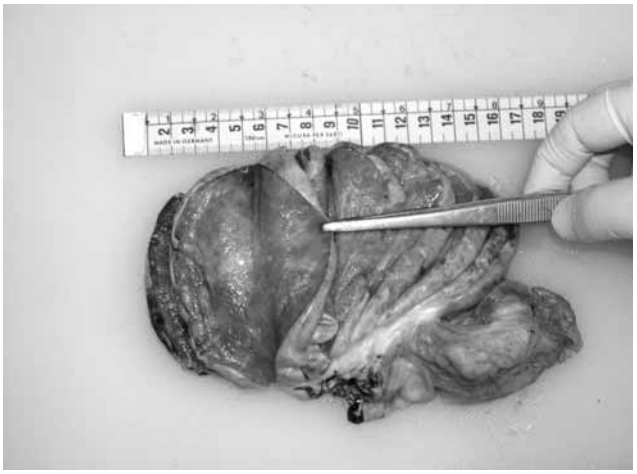

Fig. 3

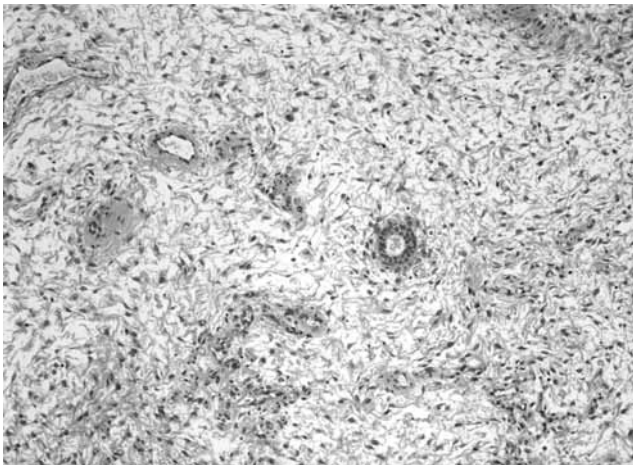

Figure 1. — Serous cystadenoma with massive ovarian edema.
Figure 2. — Gross sections of the tumor.
Figure 3. — Stromal edema separating the vessels. A follicle can be seen at the centre (H&E x10).

nodal infiltration was noted. The abdominal organs were normal.

Exploratory laparotomy was decided on. The incision was middle vertical hypo-hyper umbilical. After entering the peritoneal cavity and before any further procedure, 60 cc of peritoneal fluid were aspirated and the cavity was washed with 120 cc of serum which was also aspirated for cytological examination. A large two-lobed mass occupying the pelvis, resembling an ovarian tumour in torsion was found. The cystic and solid lobes were well outlined (Figure 1).

Right salpingo-oophorectomy was performed. Frozen section histology was negative for malignancy and consistent with MOE. The left ovary was found enlarged (almost 5 cm) and was preserved.

The patient was re-examined three months postoperatively. By that time, menarche had been established. After the first menstrual cycle, she had no menses for two months and progesterone was prescribed. She responded well to this treatment. Six months later she had regular menses and was in good health.

Pathologic findings

A 15 cm large, encapsulated, partly sectioned tumour was received at the Department of Pathology. Upon further sections, it had a yellowish colour and a soft "humid" consistency with fluid oozing from the sectioned surfaces. It was connected to a 4.8 cm long fallopian tube and a 13.5 cm large unilocular cyst, with smooth outer and inner surfaces containing clear serous fluid (Figure 2).

The frozen section report was that of MOE; the diagnosis was confirmed with tissue fixed in buffered formalin solution. The cyst was diagnosed as a serous cystadenoma (Figure 3).

Discussion

MOE is a rare but distinct clinicopathological entity. Serov *et al.* [1] defined it as "marked enlargement of one or both ovaries by an accumulation of edema fluid in the stroma, separating normal follicular structure". The World Health Organization's Histological Classification [1] defines this tumor-like condition as "an accumulation of edema fluid within the ovarian stroma separating normal follicular structures. In some cases the stroma contains lutein cells and the patient is virilised". This entity was first noted by Gustafson *et al.* (2) but it was not characterised until Kalstone *et al.* [3] described it in 1969.

About 90 cases have been reported worldwide [4]. Usually MOE concerns adolescents and young women aged 5-33 years [5] with a mean age of 21 years. Similar cases have also been reported in menopausal and pregnant women [6, 7]. In almost half of the cases, there is

evidence during surgery indicating ovarian torsion [7]. Usually, 85% of the cases are unilateral, 75% affecting the right ovary and only 15% are bilateral [7]. The predisposition for the right ovary is supposed to be due to elevated right ovarian vein pressure, caused by the anatomic drainage from the right ovary directly to the inferior vena cava [8]. Alternatively it may be because of the sigmoid colon decreasing the left adnexal mobility [9].

MOE is typically present with acute abdominal pain when there is concomitant torsion and a pelvic mass. Cases of MOE also present as an incidental finding at laparotomy. Menstrual irregularity is a quite common sign, affecting post-pubertal women, but it subsides after treatment. Acute virilisation occurs in 25% of the cases [10]. Precocious puberty or early puberty and infertility have also been reported [11, 12]. It has also been associated with polycystic ovary syndrome (POS), ovarian fibrothecoma, twin pregnancy, ovarian capillary hemagioma, mucinous cystadenoma, leiomyomatous nodule, diffuse intraabdominal fibromatosis, Meig's Syndrome and metastatic carcinomas [13-16]. Our case is the second report of MOE associated with ovarian serous cystademona in a young patient [13].

The exact a aetiology is still controversial. Two theories have been suggested to explain the pathogenesis of MOE. It is supposed that MOE is either a primary or a secondary result of partial torsion of the mesovarium, depending on the underlying pathology that led to torsion as a predisposing factor [17]. Torsion is the result of venous and lymphatic obstruction but not arterial occlusion, so there is no hemorrhage or infarction [10]. The resulting lymphedema leads to proliferation of the stromal cells and in some cases to conversion to lutein cells. This luteinisation and stromal hyperplasia result in an increase in ovarian androgen and estrogen production, causing virilisation and pubertal abnormalities [18]. The second hypothesis suggests that stromal proliferation or stromal hyperthecosis can occur, with resultant ovarian enlargement and subsequent torsion and edema [10]. This hypothesis is supported by the fact that there are cases of MOE in patients with a previous surgically fixed ovary [19]. There are also cases of relapse.

Most authors agree that the definitive diagnosis of MOE cannot be established preoperatively [15], because the diagnosis is usually intraoperative [14]. Recommended investigation includes the evaluation of the pituitary-ovarian axis, ovarian tumor markers, US and MRI of the ovaries [20, 21]. Sonographic findings indicating MOE can also be detected in cases of PCOS as multiple ovarian follicles are located at the peripheral cortex of an enlarged ovary [22]. Unlike typical fibroma and fibrothecoma, MRI may reveal a mass with unhomogeneous content and predominantly high signal intensity on T2-weighted MRI, indicating an abundant fluid component [23]. It is commonly accepted that frozen section can confirm the final diagnosis.

The differential diagnosis in cases of MOE is very significant, since benign or malignant ovarian tumours should be taken under consideration preoperatively. The most important entity to exclude is ovarian cancer. In prepubertal girls, ovarian tumours account for approximately 1% of childhood malignancies. They are rare in early childhood with the median age for most ovarian tumours being greater than eight years [21, 24]. Metastatic disease of another malignancy may be a cause of MOE if the ovarian lymphatic vessel is obstructed by carcinoma cells [25, 26]. MOE must be distinguished from fibroma and stromal hyperplasia. Unlike the edematous fibroma, which displaces ovarian structures such as follicles, corpora lutea, and corpora albicantia, the edematous tissue in cases of MOE surrounds these structures [27].

Our patient was a 13-year-old premenarcheal girl, who underwent right salpingo-oophorectomy due to MOE. The cystic compartment had the appearance of serous cystadenoma when examined at the Pathology Department. The patient presented with established menarche three months after surgery. After the first menstrual cycle she missed the two next cycles and was treated with progesterone. Six months later, on regular follow-up, she reported regular menses and was in good health.

The most conservative management should always be considered in younger patients. Ovarian suspension may be more appropriate, when histology on frozen section suggests a benign lesion. Our patient had no possibility of preserving the affected ovary since this large tumour coexisted with serous cystadenoma.

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