Edematous Rim Sign in Acute Salpingitis

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In this report, we present the case of a 23-year-old woman who was admitted for lower abdominal pain. Left lower abdominal tenderness and left adnexal tenderness were noted on physical examination. Ultrasonography revealed a tubular heteroechogenic mass with a rim of hypoechoogenicity in the left adnexal region adjacent to the ovary and attached to the body of the uterus. The mass was thought to be the acutely inflamed left fallopian tube with edema all over on the serosal surface. A diagnosis of acute pelvic inflammatory disease was made and antibiotic therapy was prescribed. This ultrasonographic sign of an edematous rim may be useful as an indication for early empirical antibiotic therapy for acute salpingitis.

KEY WORDS — acute salpingitis, edematous rim, ultrasonographic sign

Introduction

At present, the incidence of acute pelvic inflammatory disease (PID) is on the rise. Delayed treatment often leads to complications, including chronic pelvic pain, infertility and ectopic pregnancy. Therefore, empirical antibiotics are usually prescribed upon clinical diagnosis, but they have a low sensitivity. Ultrasonographic signs have been determined by various researchers for the early diagnosis of PID. Here, we present a case where the diagnosis of PID was made with the help of an “edematous rim” sign seen around an inflamed fallopian tube on ultrasonography.

Case Report

A 23-year-old sexually active nulliparous woman was admitted for a few days for left lower quadrant abdominal pain. The pain was described as sharp and exacerbating with movement. An increased amount of vaginal discharge was also present. However, she did not have any gastrointestinal or urinary symptoms. She had seven sexual partners and had not used any contraception. Her last menstrual period was 5 months ago, and she had undergone surgical termination of pregnancy 2 months previously. Prior to this, her menstrual cycles had been regular, she enjoyed good health and did not have a history of sexually transmitted diseases.

Physical examination showed that she was afebrile. Abdominal examination revealed tenderness in the left lower quadrant. Left adnexal tenderness was also noted during pelvic examination. Pregnancy test was negative. There was leukocytosis and neutrophilia. Transvaginal ultrasonography (TVS) was performed, which showed a 12-mm wide tubular heteroechogenic mass with a rim of hypoechoogenicity in the left adnexal region adjacent to the...
ovary and attached to the body of the uterus (Figs. 1 and 2). The pelvic organs were otherwise normal and there was no fluid in the pelvis. The mass was thought to be the acutely inflamed left fallopian tube with edema all over on the serosal surface.

A diagnosis of acute PID was made and antibiotics, including cefuroxime, metronidazole and doxycycline, were initiated. Screening tests for sexually transmitted diseases were negative except for *Chlamydia trachomatis*. The vaginal swab grew *Gardnerella vaginalis*. After 6 days, the patient was discharged; she was re-examined 3 months later when she was found to be in normal health. TVS was repeated and showed a 3.9-mm wide left adnexal elongated tubular hypoechogenic cystic structure connected to the body of the uterus (Fig. 3). The structure was compatible with a hydrosalpinx.

**Discussion**

Despite many attempts to standardize the clinical diagnosis of acute PID, sensitivity remains low. The required diagnostic criteria appear to remain as: (1) a history of lower abdominal pain and the presence of lower abdominal tenderness with or without rebound; (2) cervical motion tenderness; (3) adnexal tenderness. However, patients with PID, for instance, due to *Chlamydia trachomatis*, are usually not seriously ill and the symptoms are often mild and transient [1]. Thus, antibiotics may not be prescribed in the absence of other evidence suggestive of PID.

Ultrasonography is used in the diagnosis of PID. A normal fallopian tube is usually not visible even on high-resolution TVS, unless it is surrounded by fluid. According to Timor-Tritsch et al, the best marker of tubal inflammatory disease, either acute or chronic, was the presence of an incomplete septum of the tubal wall — seen in 92% of patients. While a thick wall and the “cogwheel” sign were sensitive markers of acute disease, a thin wall and the “beads-on-a-string” sign were indicators of chronic disease [2,3]. The multifollicular structure of ovaries seems

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**Fig. 1.** Transvaginal ultrasonography shows the edematous rim sign: the 12-mm wide tubular heteroechogenic structure with a rim of hypoechogenicity (marked by crosses) attached to the body of the uterus is the inflamed left fallopian tube with serosal edema.

**Fig. 2.** The cross-sectional view of the inflamed left fallopian tube with the hypoechogenic rim of serosal edema is shown on transvaginal ultrasonography.

**Fig. 3.** Hydrosalpinx is shown on transvaginal ultrasonography: the 3.9-mm wide hydrosalpinx (arrowhead) is attached to the body of the uterus (arrow).
to be a common finding in acute PID [4]. The cause of the multifollicular ovarian structure is not known, but it is thought that the thick edematous ovarian capsule in oophoritis might prevent normal follicular growth, leading to multifollicular degeneration or disturbed maturation of the dominant follicle [5,6]. Fluid in the cul-de-sac is also a common finding in acute PID, and is thought to represent inflammatory exudate or pus. Power Doppler TVS has also been used to increase the accuracy of PID diagnosis by visualizing the increased vascularity associated with inflammation. It was 100% sensitive and 80% specific, with an overall accuracy of 93% [7].

There is no absolute sonographic sign for acute PID. It is important to reach the correct diagnosis as early as possible in order to decrease the risk of long-term sequelae [8,9]. The edematous rim sign described in the current case is the serosal edema on an inflamed fallopian tube, and may serve as one of the early signs of acute salpingitis before the stage where intraluminal fluid is present to give rise to the signs of cogwheel or incomplete septa with thick tubal wall. The edematous rim sign may be useful as an indication for early empirical antibiotic treatment.

Moreover, Taipale et al. found that about 50% of the patients in whom a thick-walled adnexal mass was detected by TVS during admission developed hydrosalpinx later in the following 3 months. Even if there is no adnexal mass during hospitalization, hydrosalpinx may develop later. Therefore, a 3-month follow-up is recommended after the onset of PID, especially for patients with adnexal masses [4]. The patient described here had a scan suggestive of hydrosalpinx 3 months after the acute PID, despite early initiation of treatment.

References