

## Case Report

# Individual Fallopian Tube Torsion: A Rare and Randomly Diagnosed Finding during Cesarean Section

Euthymia Thanasa<sup>1\*</sup>, Ioannis K. Thanasas<sup>2</sup>, Nikoleta Koutalia<sup>2</sup>, Athanasios Chasiotis<sup>3</sup>,  
Maria Mousia<sup>4</sup>

### Abstract

<sup>1</sup>Medical School, Aristotle University of Thessaloniki, Thessaloniki, Greece

<sup>2</sup>Department of Obstetrics and Gynecology, General Hospital of Trikala, Trikala, Greece

<sup>3</sup>Department of Obstetrics and Gynecology, General Hospital of Limassol, Limassol, Cyprus

<sup>4</sup>Department of Pathology, General Hospital of Trikala, Trikala, Greece

\*Corresponding Author's Email:  
[thanasasg@hotmail.com](mailto:thanasasg@hotmail.com)  
Tel.: 2431029103 / 6944766469

The presentation of this case concerns a pregnant woman who during the 39th week, was admitted to our clinic in order to undergo a scheduled caesarean section. The presence of a serous cyst in the anatomical position of the left iliac fossa was known from the beginning of the pregnancy, which otherwise progressed uncomplicated. Upon admission to the clinic, the pregnant woman reported a mild, diffuse abdominal pain for about three days ago, without signs of labor onset. The preoperative laboratory examination was without any pathological findings. Intraoperatively, the presence of a sub-round formation with a brownish-red tinge and a smooth outer surface, along with the corresponding fallopian tube, was found in the left parametrium, without the involvement of the ovary. The histological examination of the surgical specimen established the diagnosis of individual fallopian tube torsion, accompanied by a paratubal cyst. After an uncomplicated postoperative course, the patient was discharged on the 4<sup>th</sup> postoperative day.

**Keywords:** Diagnosis, Paratubal cyst, Pregnancy, Torsion, Treatment

## INTRODUCTION

Adnexal tumors among pregnant women are not common. In most cases they are discovered randomly and are related to ovarian neoplasms. They are usually discovered in the first or second trimester of pregnancy and in 65% - 80% of cases are asymptomatic (Hakoun et al., 2017). The incidence of adnexal masses before the 14th week of pregnancy ranges from 6% - 25%. These are usually reversible functional ovarian cysts. Only 0.7% - 1.7% of those cases persist throughout the pregnancy (Yazbek et al., 2007). Extremely rare cystic benign tubular tumors are thought to be of embryological origin. The preoperative diagnosis is very difficult to impossible and is usually established intraoperatively, or by the pathological examination of the surgical specimen (Runnebaum and Stickeler, 2001). Generally, the impact of adnexal masses on pregnant women is difficult to be

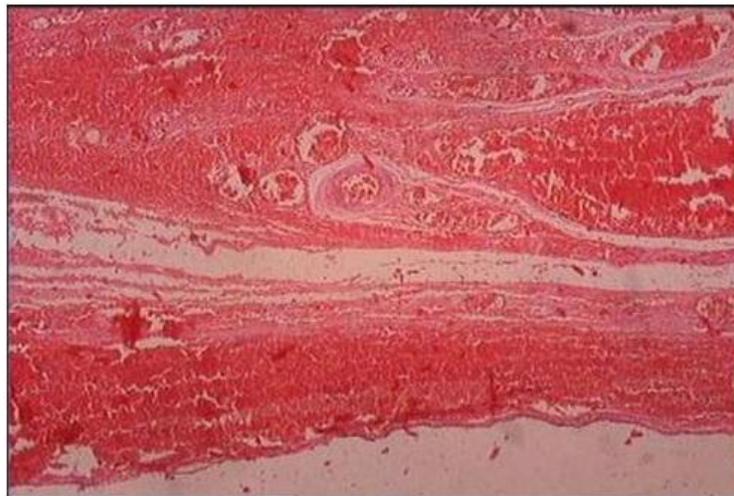
estimated accurately (Yacobozzi et al., 2012). Nowadays, with the widespread application of ultrasound in pregnancy monitoring, the rates of detection of adnexal masses among pregnant women have increased significantly and are estimated to be 1 in 76 to 1 in 2328 births (Hoover and Jenkins, 2011; Aggarwal and Kehoe, 2011).

## CASE DESCRIPTION

The case concerns a pregnant woman, para 1, with a history of a previous cesarean section who was admitted to the Obstetric - Gynecologic clinic of General Hospital of Trikala, for a planned cesarean section. Concerning the antenatal visits of the patient, the presence of a



**Figure 1.** The randomly diagnosed finding of a twisted paratubal cyst during a planned caesarean section with secondary individual torsion of the corresponding fallopian tube (our case). Hemorrhagic infiltration and ischemic necrosis of the fallopian tube is evident, as well as the non-involvement of the corresponding ovary (red arrows) and the characteristic appearance of the corresponding fallopian tube along the outer surface of the cystic wall (white arrows).



**Figure 2.** Histological image of a paratubal cyst torsion (our case).

serous cyst with a maximum diameter of about 80 mm in the anatomical position of the left adnexa was diagnosed by ultrasound, from the beginning of pregnancy. Her hereditary history was of no pathological significance. The pregnancy progressed normally and uncomplicated. Upon admission to the clinic, the patient reported a mild and deep pain in the abdomen, that had been diffuse for about three days, with no signs of onset of labor. No uterine contractions were detected during the cardiotocographic examination. The preoperative laboratory test was normal. Inflammation indices were negative (WBC  $7.96 \times 10^3$ , NEUT 74.8%), no anemia was detected (Hb 14.1 gr / dl) and blood clotting test was

within normal limits. The biochemical control and urine examination were without pathological findings.

During the caesarean section, after the delivery of the fetus and the suturing of the uterine wall, a sub-round formation with a maximum diameter of about 70 mm, brownish-red in color with a smooth outer surface was found in the left adnexa. The fallopian tube ran along the surface of the lesion, without the involvement of the corresponding ovary (figure 1). The hemorrhagic necrotic wall of the cyst with a coating of cuboidal, squamous or columnar epithelium and the hemorrhagic necrotic tubule, as were revealed by the microscopic examination of the surgical specimen (figure 2), confirmed the diagnosis of a

paratubal cyst's torsion with only the individual involvement of the corresponding tube. The postoperative course was uncomplicated. The patient was discharged on the fourth postoperative day, with the instruction for re-examination at the end of puerperium.

## DISCUSSION

The paratubal or paraovarian cysts are generally uncommon. It is estimated that they account for about 5% - 20% of all adnexal tumors, while they usually appear in the reproductive age, during the third to fourth decade of life (Gupta et al., 2016). The paratubal cysts, mimicking the ovarian ones, may undergo torsion. When they affect pediatric patients, it is difficult to be distinguished from acute appendicitis (Chauhan and Blacker, 2005). In adults, the paraovarian cyst torsion, accompanied by a secondary individual torsion of the corresponding fallopian tube is rare. By extend, the occurrence of a paratubal cyst torsion during pregnancy is extremely rare as well, but it should be considered in the differential diagnosis in cases of acute abdomen among pregnant women (Phupong and Intharasakda, 2001). The paratubal cysts, although not sufficiently studied and understood concerning their etiology and pathophysiology, are likely to be of embryological origin and represent remnants of the paramesonephric or mesonephric duct (Bohîtea et al., 2016). The paraovarian cysts, which are estimated to originate from Wolff's pore, are located in the broad ligament, between the ovaries and the fallopian tube (Asare et al., 2015) and were first described as a separate entity in 1973 by Kariminejad and Scully (Kariminejad and Scully, 1973). The individual torsion of the fallopian tube without the corresponding ovarian involvement, both among pregnant or non-pregnant women, is usually associated with hydrosalpinx, hematosalpinx, pelvic congestion syndrome and pelvic inflammatory disease, previous fallopian tube surgery, paratubal cyst (our case), Morgani cyst and other adnexal entities, or may even occur in an otherwise normal fallopian tube (Yalcin et al., 1997; Antoniou et al., 2004; Toyoshima et al., 2015).

The preoperative diagnosis of paratubal cysts is difficult, especially when they complicate pregnancy. The changes that occur during a normally developing pregnancy and the, often reported, symptom of abdominal discomfort, make it difficult to diagnose a paratubal cyst especially in those cases where the symptoms are mild (our case). In most circumstances, paratubal cysts are asymptomatic. A mild, deep abdominal pain, or/and the sudden onset of an acute abdominal one, are usually associated with large lesions, or complications such as bleeding, rupture, or torsion of the fallopian tube (Bohîtea et al., 2016). In addition, nausea, vomiting, and signs of peritoneal irritation on palpation of the abdominal wall, support the diagnosis of

an isolated torsion of the fallopian tube, which is accompanied by a paratubal cyst (Toyoshima et al., 2015).

In contrast to clinical findings, imaging is often useful in diagnosing paratubal cysts. The abdominal or transvaginal ultrasounds are currently in the first line for the diagnosis of those lesions (Coccia et al., 2014). Simple paratubal cysts are usually depicted as single-chambered, thin-walled cysts with smooth borders, located between the ovary and the uterus. The absence of ovarian structures (such as follicles), the mobility of the mass and its separation from the ovary during the manipulation with the transvaginal probe, are consistent and characteristic ultrasound findings that support the diagnosis of a paratubal cyst. The presence of single- or multi – chambered cysts, with papillary invasions from the cystic wall usually indicate a borderline malignant tumor (Savelli et al., 2006).

The differential diagnosis between ovarian and paratubal cysts remains difficult, as well as the malignant potential of those. Nevertheless, it is possible nowadays with a thorough ultrasound examination to distinguish between benign and malignant adnexal tumors. Recently, Sokalska and colleagues analyzing the results of their study indicated that the ultrasonographically diagnosed dermoid cysts, hydrosalpinxes, functional cysts, paratubal cysts, peritoneal pseudocysts, fibroids and thecomas, were never perceived as malignant ones (Sokalska et al., 2009). The use of Power Doppler ultrasound in distinguishing the benign from malignant adnexal tumors, did not offer what was expected (Jokubkiene et al., 2007). The use of magnetic resonance imaging in paratubal cysts has not been reported to date. The ability to image a normal corresponding ovary is expected to be perhaps an important diagnostic finding (Kishimoto et al., 2002).

The diagnosis of paraovarian cysts is easily made in the operating room. Intraoperatively, the non – involvement of the corresponding ovary is evident, as well as the characteristic presence of the fallopian tube on the outer surface of the cystic wall (our case, figure 1). Furthermore, surgical intervention (laparoscopy, laparotomy) not only ensures the diagnosis, but allows the radical treatment of the lesion as well. Laparoscopy seems to be the most common surgical approach in the treatment of patients with paratubal cysts nowadays (Darwish et al., 2003). The laparotomy and the removal of the twisted part is also suggested (Ogburn et al., 2005). Finally, other researchers claim that the ultrasound-guided suction of the contents of simple cysts during pregnancy is safe, prevents the surgical intervention with all the possible complications that may arise for the mother and the fetus and in addition, in some cases it may be the definitive cure (Caspi et al., 2000). The prognosis is usually good. Although cases of borderline malignancies or invasive adenocarcinomas within the paratubal cyst wall have been reported in the

literature, generally those cysts are usually rare and asymptomatic tubal neoplasms with a low potential of malignancy. The complications of paratubal cysts, as they are described in the literature, include torsion, which accounts for 2% - 16% of cases, bleeding, rupture, secondary infection, and malignancy in approximately 2.9% of cases. The torsion of paraovarian cysts is three times more common in pregnant women, probably due to the large and rapid growth of the uterine body, during a normally developing pregnancy (Gedam et al., 2014).

## CONCLUSION

The individual torsion of the fallopian tube accompanied by a paratubal cyst is a rare nosological entity, which however should be taken seriously into account in the differential diagnosis of an acute or mild, deep, diffuse abdominal pain during pregnancy, especially in the last trimester. Preoperative diagnosis is not easy, while furthermore serious dilemmas and controversies may arise concerning their treatment. The early recognition of the symptoms associated with the disease and the correct application of modern and advanced technology, are likely to facilitate the early diagnosis and immediate application of the most appropriate and modern treatment options, in order to ensure the most accurate treatment of the disease and the best possible prognostic result.

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