

Navigating a Tubo-ovarian Abscess: A Case Report

**Hala Al-khalidy¹, Ahila Abu-Nayla², Khalid W. Alkaissi³
and Umniyah Abu-Nayla⁴**

Abstract

Tubo-ovarian abscess (TOA) represents a severe complication of pelvic inflammatory disease (PID) and can lead to significant morbidity if not promptly diagnosed and managed. We reported a case of a 36-year-old Palestinian woman who presented with fever and severe lower abdominal pain, initially diagnosed as acute pyelonephritis, but later found to have bilateral tubo-ovarian abscesses complicated by extended-spectrum beta-lactamase (ESBL) infection. The case underscores the challenges in managing complex pelvic infections and highlights the importance of timely intervention and tailored antibiotic therapy.

Keywords: Pyosalpinx, tubo-ovarian abscess, peritonitis, pelvic inflammatory disease.

¹ Specialist Obstetric-Gynecologist F.A.C.S, D.G.O, Master's Degree of Obstetrics, Medcare Sharjah, UAE.

² Medical Intern, MBBS, Prime Hospital, UAE.

³ General Practitioner, MBBS, Sharjah, UAE.

⁴ Obstetrics and Gynecology Resident at DAHC, UAE.

1. Introduction

TOA is characterized by the formation of pus-filled masses involving the fallopian tubes and ovaries, often resulting from ascending genitourinary tract infections. While typically associated with sexually transmitted infections, non-sexually transmitted pathogens can also contribute to its development. ESBL-producing organisms pose a particular challenge due to their resistance to commonly used antibiotics. Here, we describe the clinical presentation, diagnostic workup, surgical intervention, and management outcomes of a patient with bilateral TOA complicated by ESBL infection.

2. Case Report

A 36-year-old Palestinian woman presented to the emergency department on December 18, 2023, complaining of fever and severe lower abdominal pain radiating to the loin. Physical examination revealed lower abdominal tenderness and rebound tenderness.

On December 18, 2023, laboratory investigations showed a Hemoglobin level of 13 g/dl, White Blood Count of 15/uL with elevated neutrophils, a C-reactive protein level of 270.5 mg/L, and Procalcitonin at 0.163 ng/ml. Urinalysis indicated high WBC, Leukocytes esterase +3, RBC 10-15, and a urine culture revealed *Enterobacter Aerogenes* susceptible to Amikacin and Meropenem. The initial diagnosis was Acute Pyelonephritis with Renal Colic, leading to admission for intravenous antibiotics.

A Computed Tomography scan performed on 19th December 2023 showed mesenteric fat stranding, normal kidneys, distended bladder and a large oval shaped enhancing thick-walled cystic mass lesion [7.95 x 6.4 cm] noted at site of the left ovary likely of ovarian cyst causing mass-effect displaced uterus. The uterus was grossly normal. Small free fluid was observed in bilateral iliac fossa but more on the right side. A consultation from the Obstetric-Gynecologist suggested a query of Pelvic Inflammatory Disease.

On December 20, 2023, the patient's Hemoglobin dropped to 10.55 g/dl, CRP raised to 450 mg/L, and Procalcitonin increased to 1.98 ng/ml. Despite a clear Urinalysis, the patient continued to be febrile and in pain. An erect abdominal X-ray Abdomen erect revealed Multiple gaseous bowel loops dilatation in the right side of the abdomen. And ultrasound of the abdomen revealed Bulky bilateral ovaries with bilateral adnexal cyst suggestive of ovarian cyst with free fluid in the iliac fossa bilaterally. Antibiotic therapy for four days yielded no improvement, leading to increased liver function test abnormalities.

A follow-up Computed Tomography on December 22 indicated bilateral adnexal multi-loculated peripherally enhancing collections seen extending into the cul-de-sac, surrounding and anteriorly displacing the uterus with a connection between the 2 collections noted anteriorly as well as features of pyosalpinx. Mild hepatosplenomegaly was also noted. The findings are suggestive of extensive

bilateral tubo-ovarian abscesses. The patient was then diagnosed with Tubo-Ovarian Abscess and subsequently shifted to surgery.

During laparoscopy, a large abscess with greenish pus in the left adnexa and adhesions of bowel loops to the abdominal wall were found, suggesting peritonitis. Abscess drainage revealed a thick greenish pus with a positive ESBL culture. The abscess was not completely removed due to adhesions. The patient received antibiotics according to sensitivity and gradually improved, leading to discharge.

Several days later, the patient returned to the outpatient department with a mild irregular fever (37.5°C) and mild pain. A repeat CT scan with contrast showed another collection in the right side and the pelvis. The patient opted for conservative management, refusing further exploration.

3. Discussion

Tubo-ovarian abscess (TOA) refers to an infectious and inflammatory mass involving the fallopian tubes and/or ovary, with the potential to extend to neighboring organs [1]. This condition is recognized as a serious complication of Pelvic Inflammatory Disease (PID) and has the capacity to lead to severe sepsis [2] Approximately one in three women who experience PID ultimately progresses to developing a tubo-ovarian abscess [2,3]. The risk factors associated with TOA align closely with those of PID. Women within the age range of 15 to 25, with a history of multiple partners, and a previous episode of PID, are at a heightened risk. Additionally, women with immunodeficiency, due to various factors, are more prone to experiencing severe PID, consequently elevating the risk of developing a tubo-ovarian abscess [4,5]. Moreover, insufficient or lacking contraceptive measures, the use of intrauterine devices, and a lower socio-economic status further contribute to the susceptibility of developing a TOA [6,7].

TOA is a clinical diagnosis based upon the history and examination of the patient along with radiologic evidence of a pelvic mass in a patient with symptoms aligned with PID. The predominant symptoms of TOA encompass abdominal and pelvic pain, fever, chills, vaginal discharge, and nausea [8]. Comprehensive blood analysis might unveil leukocytosis, elevated C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) levels but those laboratory findings are not always present [9, 10, 11]

In terms of diagnostic imaging, pelvic ultrasonography stands out as the primary modality ². Sonographic identification of TOA typically reveals complex multilocular cystic masses with thick irregular walls, mixed echogenicity, and disruption of normal anatomical features [12]. Distinctive findings on computed tomography (CT) aligning with TOA comprise thick-walled, rim-enhancing adnexal masses. Inflammatory masses often exhibit a multilocular nature, and their appearance may indicate increased fluid density, suggestive of purulent exudate ¹³. CT imaging may also reveal thickened fluid-filled tubes consistent with pyosalpinx, regional bowel thickening, and mesenteric stranding in some cases of TOA [13]. The optimal way for diagnosis of a patient with TIA is laparoscopy as it has the

additional benefit of simultaneous drainage or culture of the abscess. [14] Patients diagnosed with TOA necessitate hospitalization and a minimum 24-hour observation to rule out rupture or generalized sepsis. Medical management is usually tried first with the preferred intravenous antibiotic regimens being a cephalosporin plus doxycycline [15]. Once 24 hours afebrile [8], a 14-day oral course of doxycycline can be tried [16] along with Metronidazole for broader anaerobic coverage [17].

70% of TOA cases are managed medically but surgical treatment is required in the remaining cases [3]. Interventional radiological techniques like imaging-guided drainage of TOA can also be used. Abscesses over 8 cm are more likely to necessitate drainage or surgery [18,19]. Various surgical approaches, such as transabdominal unilateral salpingo-oophorectomy and total abdominal hysterectomy are proposed [14]. Laparoscopic approaches, including drainage and excision, when combined with antibiotic use have shown positive outcomes with a 100% cure rate in some studies [20,21]. Early laparoscopy exhibits shorter operation times and hospital stays compared to late laparoscopy [22]. Fertility preservation studies also reveal better outcomes with laparoscopic drainage and antibiotic treatment, with fewer adhesions and higher pregnancy rates compared to antibiotic-only treatment [23].

4. Conclusion

This case underscores the complexities in addressing tubo-ovarian abscesses, highlighting the crucial role of swift diagnosis, appropriate antibiotic treatment, and surgical intervention when necessary. While the occurrence of bilateral tubo-ovarian abscesses complicated by ESBL infection is uncommon, it represents a severe consequence of pelvic inflammatory disease. This case emphasizes the critical need for early identification, proactive surgical measures, and personalized antibiotic regimens for effectively managing intricate pelvic infections. The significance of ongoing monitoring and patient follow-up cannot be overstated, as it is crucial for evaluating the efficacy of the selected management approach.

ACKNOWLEDGEMENTS. We thank the patient and his family members for providing consent and for his participation in the case.

References

- [1] Granberg, S., Gjelland, K. and Ekerhovd, E. (2009). The management of pelvic abscess. *Best Pract Res Clin Obstet Gynaecol* 2009; 23: 667–678.
- [2] Taylor, K.J., Wasson, J.F., De Graaff, C., Rosenfield, A.T. and Andriole, V.T. (1978). Accuracy of grey-scale ultrasound diagnosis of abdominal and pelvic abscesses in 220 patients. *Lancet* 1978; 1: 83–84.
- [3] Landers, D.V. and Sweet, R.L. (1985). Current trends in the diagnosis and treatment of tuboovarian abscess. *Am J Obstet Gynecol* 1985; 151: 1098–1110.
- [4] Cohen, C.R., Sinei, S., Reilly, M., ... and Kreiss, J. (1998). Effect of human immunodeficiency virus type 1 infection upon acute salpingitis: a laparoscopic study. *J Infect Dis* 1998; 178: 1352–1358.
- [5] Kamenga, M.C., De Cock, K.M., St Louis, M.E., ... and Kreiss, J.K. (1995). The impact of human immunodeficiency virus infection on pelvic inflammatory disease: a case control study in Abidjan, Ivory Coast. *Am J Obstet Gynecol* 1995; 172: 919–925.
- [6] Westrom, L. (1980). Incidence, prevalence, and trends of acute pelvic inflammatory disease and its consequences in industrialized countries. *Am J Obstet Gynecol* 1980; 138: 880–892.
- [7] Soper, D.E. (1994). Pelvic inflammatory disease. *Infect Dis Clin N Am* 1994; 8: 821–840.
- [8] Landers, D.V. and Sweetm R.L. (1983). Tubo-ovarian abscess: contemporary approach to management. *Rev Infect Dis* 1983; 5: 876–884.
- [9] Cohen, C.R., Mugo, N.R., Astete, S.G., ... and Totten, P.A. (2005). Detection of *Mycoplasma genitalium* in women with laparoscopically diagnosed acute salpingitis. *Sex Transm Infect* 2005; 81: 463–466.
- [10] Wiesenfeld, H.C. and Sweet, R.L. (1993). Progress in the management of tuboovarian abscesses. *Clin Obstet Gynecol* 1993; 36: 433–444.
- [11] Eschenbach, D.A., Buchanan, T.M. ... and Holmes, K.K. (1975). Polymicrobial etiology of acute pelvic inflammatory disease. *New England Journal of Medicine* 293.4 (1975): 166-171.
- [12] McNeeley, S.G., Hendrix, S.L., Mazzoni, M.M., Kmak, D.C. and Ransom, S.B. (1998). Medically sound, cost-effective treatment for pelvic inflammatory disease and tuboovarian abscess. *Am J Obstet Gynaecol* 1998; 178: 1272–1278.
- [13] Hiller, N., Sella, T., Lev-Sagi, A., Fields, S. and Lieberman, S. (2005). Computed tomographic features of tuboovarian abscess. *J Reprod Med* 2005; 50:203.
- [14] Krivak, T.C., Cooksey and C., Propst, A.M. (2004). Tubo-ovarian abscess: diagnosis, medical and surgical manage.ent. *Compr Ther* 2004; 30(2): 93–100.
- [15] Workowski, K.A. and Berman, S. (2010). Sexually transmitted diseases treatment guidelines, 2010. *MMWR Recomm Rep* 2010; 59: 1–110.

- [16] Chappell, C.A. and Wiesenfeld, H.C. (2012). Pathogenesis, diagnosis and management of severe pelvic inflammatory disease and tuboovarian abscess. *Clin Obstet Gynecol* 2012; 55: 893–903.
- [17] Dodson, M.G. (1994). Antibiotic regimens for treating acute pelvic inflammatory disease. An evaluation. *J Reprod Med* 1994; 39: 285–296.
- [18] Reed, S.D., Landers, D.V. and Sweet, R.L. (1991). Antibiotic treatment of tuboovarian abscess: comparison of broad-spectrum beta-lactam agents versus clindamycin-containing regimens. *Am J Obstet Gynecol* 1991; 164: 1556–1561; discussion 61–62.
- [19] DeWitt, J., Reining, A., Allsworth, J.E. and Peipert, J.F. (2010). Tuboovarian abscesses: is size associated with duration of hospitalization & complications? *Obstet Gynecol Int* 2010; 2010: 847041.
- [20] Moir, C. and Robins, R.E. (1982). Role of ultrasound, gallium scanning and computed tomography in the diagnosis of intraabdominal abscess. *Am J Surg* 1982; 143: 582–585.
- [21] Henry-Suchet, J., Soler, A. and Loffredo, V. (1984). Laparoscopic treatment of tubo-ovarian abscess. *J Reprod Med* 1984; 29: 579–582.
- [22] Chu, L., Ma, H., Liang, J., ... and Tong, X. (2019). Effectiveness and adverse events of early laparoscopic therapy versus conservative treatment for tubo-ovarian or pelvic abscess: a single-center retrospective cohort study. *Gynecol Obstet Invest* 2019; 84(4): 334–342.
- [23] Rosen, M., Breitkopf, D. and Waud, K. (2009). Tubo-ovarian abscess management options for women who desire fertility. *Obstet Gynecol Surv* 2009; 64: 681–689.