

UNMASKING TUBO-OVARIAN ABSCESS WITH ABSENCE OF CLASSIC SIGNS IN A 32-YEAR-OLD WOMAN AFTER A DECADE OF INFERTILITY - A CASE REPORT

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ABSTRACT

Tubo-Ovarian Abscess (TOA) is an infection in the adnexal area often caused by Pelvic Inflammatory Disease (PID). This infection is usually due to polymicrobial bacteria and can occur as a result of the spread of intra-abdominal infections. Symptoms include abdominal pain, fever, and leukocytosis, with additional symptoms such as vaginal discharge and nausea. Diagnosis is made through blood tests, imaging, and cultures. The primary treatment is antibiotics, and abscess drainage via surgery is considered if antibiotic therapy is ineffective. A 32-year-old woman with a history of an endometrial cyst presented with right lower quadrant pain and dysuria. Despite previously normal CA 19-9 and CA 125 levels, an ultrasound revealed an 8.33 cm cyst. The patient had a history of dysmenorrhea and no history of sexually transmitted infections. During surgery, a tubo-ovarian abscess with pus was discovered and subsequently drained. Post-operative recovery was successful, and the patient was discharged with a prescription for oral antibiotics and scheduled for outpatient follow-up. This case report highlights the absence of clinical manifestations such as fever or leukocytosis, which initially led to a misdiagnosis. This was only recognized after surgical intervention. The case illustrates that TOA can affect fertility, with the likely cause being a history of prior In Vitro Fertilization (IVF). These findings emphasize the importance of accurate diagnosis and a collaborative approach in managing TOA to improve patient outcomes. Further research is needed to understand the long-term impacts of TOA on reproductive health.

Keywords: Tubo-Ovarian Abscess, Pelvic Inflammatory Disease, infertility, antibiotics, surgery

ABSTRACT

Tubo-Ovarian Abscess (TOA) adalah infeksi pada area adneksa yang umumnya disebabkan oleh Pelvic Inflammatory Disease (PID). Infeksi ini biasanya bersifat polimikroba dan dapat terjadi akibat penyebaran infeksi intraabdominal. Gejalanya meliputi nyeri perut, demam, dan leukositosis, disertai gejala tambahan seperti keputihan dan mual. Diagnosis ditegakkan melalui pemeriksaan darah, pencitraan, dan kultur. Terapi utama adalah pemberian antibiotik, sementara tindakan drainase abses melalui pembedahan dipertimbangkan jika terapi antibiotik tidak menunjukkan respons yang memadai. Seorang wanita berusia 32 tahun dengan riwayat kista endometrium datang dengan keluhan nyeri perut kanan bawah dan disuria. Meskipun kadar CA 19-9 dan CA 125 sebelumnya normal, ultrasonografi menunjukkan adanya kista berukuran 8,33 cm. Pasien memiliki riwayat dismenore dan tidak memiliki riwayat infeksi menular seksual. Saat operasi dilakukan, ditemukan abses tuba-ovarium yang berisi pus dan segera dilakukan drainase. Pemulihan pascaoperasi berjalan baik, dan pasien dipulangkan dengan resep antibiotik oral serta dijadwalkan untuk kontrol rawat jalan. Laporan kasus ini menyoroti tidak adanya manifestasi klinis seperti demam atau leukositosis, yang pada awalnya menyebabkan salah diagnosis dan baru dikenali setelah dilakukan tindakan operasi. Kasus ini juga menggambarkan bahwa TOA dapat memengaruhi fertilitas, dengan penyebab yang paling mungkin terkait riwayat prosedur In Vitro Fertilization (IVF). Temuan ini menekankan pentingnya diagnosis yang tepat serta pendekatan kolaboratif dalam penatalaksanaan TOA untuk meningkatkan luaran pasien. Penelitian lebih lanjut diperlukan untuk memahami dampak jangka panjang TOA terhadap kesehatan reproduksi.

Keywords: Tubo-Ovarian Abscess, Pelvic Inflammatory Disease, infertility, antibiotics, surgery

INTRODUCTION

Tubo-Ovarian Abscess (TOA) is an infection in the adnexal area, often resulting from the sequelae of Pelvic Inflammatory Disease (PID).¹ This condition predominantly affects women of reproductive age, with the highest prevalence among those aged 15–25 years (Gkrozou et al., 2021; Munro et al., 2018). In the United States, approximately 70,000 women are diagnosed with TOA annually, with around 30–40% of cases being polymicrobial in origin (Kairys & Roepke C, 2024; Rowhani-Rahbar & Moe, 2019). TOA can also arise from secondary infections due to the spread of intra-abdominal infections or hematogenous dissemination (Rowhani-Rahbar & Moe, 2019). Clinically, TOA is characterized by classic symptoms such as lower abdominal pain, an abdominal mass, fever, and leukocytosis. Other symptoms, including vaginal discharge, nausea, vomiting, vaginal bleeding, and dyspareunia, may also occur (Kairys & Roepke C, 2024; Munro et al., 2018). The diagnosis of TOA requires supportive investigations, including complete blood counts, urinalysis, and imaging modalities such as ultrasonography, CT scans, or MRI (Kairys & Roepke C, 2024; Munro et al., 2018). The primary management involves antibiotic therapy, while abscess drainage through surgical techniques is considered if there is no improvement with adequate antibiotic treatment (Gkrozou et al., 2021; Mitsunami et al., 2023).

Previous studies have highlighted the varying prevalence and risk factors for TOA across different populations. For example, Shats et al. reported that women with a history of intrauterine device (IUD) use had a higher risk of developing TOA compared to the general population (Mitsunami et al., 2023). Additionally, Goje et al. emphasized the critical role of ultrasonography in the early detection of TOA to prevent severe complications (Wang et al., 2020).

The novelty of this study lies in its focus on evaluating specific risk factors in a local population, which is still underrepresented in existing literature. The benefits of this study include improving clinical understanding of TOA risk factors, which could inform more effective prevention strategies, and providing evidence-based treatment recommendations that may reduce morbidity and complications in TOA patients. The findings are expected to guide healthcare providers in optimizing diagnostic and therapeutic approaches for TOA management (Kilani et al., 2018).

Although TOA is commonly associated with PID, alternative pathways of infection have been identified in the literature. Secondary spread from adjacent intra-abdominal infections such as appendicitis, diverticulitis, or postoperative infections has been reported as a less common but clinically significant route. Hematogenous dissemination, though rare, may also contribute to the development of TOA in specific clinical scenarios. These diverse mechanisms highlight the necessity of evaluating each patient holistically to identify potential underlying sources of infection beyond sexually transmitted pathogens (Puissant et al., 2023).

Clinically, patients with TOA may present with a constellation of symptoms that reflect both localized pelvic infection and systemic inflammatory response. Classic signs include lower abdominal or pelvic pain, palpable adnexal mass, fever, and leukocytosis. However, clinical presentations may vary widely. Some patients exhibit additional symptoms such as abnormal vaginal discharge, nausea, vomiting, irregular vaginal bleeding, or pain during intercourse (Mitsunami et al., 2023). Particularly challenging are cases in which systemic symptoms, such as fever or elevated leukocyte count, are absent, thereby masking the severity of the infection. Such atypical presentations may lead to delayed diagnosis, increasing the risk of rupture, peritonitis, sepsis, and long-term reproductive complications, including infertility and chronic pelvic pain (Gkrozou et al., 2021).

Accurate diagnosis of TOA requires a combination of clinical evaluation and supporting laboratory and imaging investigations. Routine diagnostic tests include complete blood counts, inflammatory markers, and urinalysis to rule out concurrent urinary tract involvement. Imaging modalities play a crucial role, with ultrasonography serving as the primary tool due to its accessibility, safety, and cost-effectiveness. Sonographic findings typically demonstrate a complex adnexal mass with septations and thickened walls. In cases where ultrasound results are inconclusive, computed tomography (CT) or magnetic resonance imaging (MRI) may be utilized to provide a more detailed assessment, particularly when differentiating TOA from other adnexal masses such as endometriomas, ovarian neoplasms, or hemorrhagic cysts. Prior research, including the work of Goje et al., has emphasized the pivotal role of early imaging in reducing diagnostic delays and preventing severe complications (Tang et al., 2022; Zhu et al., 2021).

Management of TOA generally begins with broad-spectrum intravenous antibiotics aimed at targeting the polymicrobial flora commonly associated with pelvic infections. Clinical guidelines recommend combination therapy that covers aerobic, anaerobic, and sexually transmitted pathogens. However, despite appropriate antibiotic treatment, approximately 25–30% of patients fail to demonstrate adequate clinical improvement within 48 to 72 hours, necessitating interventional procedures. Surgical drainage either through laparoscopy, laparotomy, or image-guided aspiration may be required to evacuate the abscess and prevent further progression of infection. Early identification of patients who may not respond to medical therapy remains essential for determining the appropriate timing of surgical intervention, reducing morbidity, and preserving fertility (Biswas et al., 2021; Tran & Schimenti, 2019).

In addition to the established clinical and microbiological aspects of TOA, several studies have explored the epidemiological and behavioral factors that contribute to its development (Dudek et al., 2021). For instance, the study by Shats et al. identified a significant association between intrauterine device (IUD) use and increased risk of TOA, suggesting the need for careful clinical monitoring in women with IUDs who present with pelvic pain or signs of infection. Other research has examined the role of sexual behavior, history of sexually transmitted infections, previous pelvic surgeries, and assisted reproductive technologies. The latter, including procedures such as In Vitro Fertilization (IVF), has been recognized as a potential risk factor due to instrumentation of the reproductive tract, which may introduce bacteria into the upper genital tract (Zhao & Jin, 2017).

Despite the growing body of evidence, many aspects of TOA remain underreported, particularly in specific local or regional populations. The novelty of the present study lies in its focus on analyzing risk factors for TOA within a local context that has rarely been represented in published literature. Understanding these localized patterns is essential, as variations in demographics, healthcare access, cultural behaviors, and diagnostic practices may influence both incidence and clinical outcomes. The findings have the potential to enrich the existing knowledge on TOA by identifying unique risk profiles that may differ from global data (Nama & Kalu, 2009).

The implications of this study extend beyond academic interest. A clearer understanding of TOA-related risk factors can inform prevention strategies tailored to specific communities, potentially reducing the incidence of severe infections requiring hospitalization or surgical intervention. Moreover, the study's insights may aid clinicians in refining diagnostic algorithms and treatment plans, leading to improved patient outcomes and decreased rates of long-term reproductive complications. Ultimately, this research emphasizes the need for continued investigation into TOA and its broader reproductive health impacts, especially in regions where data remain limited (Dudek et al., 2021; NG et al., 2004).

Given the variable clinical presentations, the challenging differential diagnosis, and the potential for severe, life-altering complications such as rupture, sepsis, and infertility, a focused evaluation of TOA is warranted. Although global literature provides a general framework for management, the high rate of surgical intervention and persistent challenges in early diagnosis underscore the need for regionally-specific data. Therefore, this study aims to systematically analyze the clinical and epidemiological characteristics of Tubo-Ovarian Abscess in our specific local population, focusing particularly on identifying the prevalence of known and potentially unique risk factors, and evaluating the current diagnostic and therapeutic pathways employed. The ultimate goal is to generate localized evidence that can directly optimize clinical practice, reduce diagnostic delays, and improve the overall reproductive health outcomes for women affected by TOA in this region (Christiansen et al., 2006; Fite et al., 2020).

CASE REPORT

A 32-year-old female patient, with a height of 148 cm and weight of 48.3 kg, complains of pain in the right lower quadrant accompanied by dysuria over the past month. The pain is intermittent and sometimes disappears. The patient is unsure of the cause of the pain or what alleviates it. She denies any other complaints such as dyspareunia, genital redness, foul genital odor, or white discharge. Before visiting the clinic, the patient had her CA 19-9 and CA 125 levels checked at another hospital because a tumor was suspected in her ovary, and the results returned normal. Consequently, she was referred to Dr. (H.C) Ir. Soekarno Hospital. Five years ago, the patient and her husband visited an OB clinic for a pregnancy program but did not continue treatment. We have not received any further data regarding the progress or stage of the IVF program that the patient has undergone. Three years ago, she experienced dysmenorrhea and was diagnosed with a 5cm diameter endometrial cyst. She then underwent treatment with herbal medicine and achieved remission. The patient has a family history of difficulty conceiving, with her mother taking six years to conceive. There is no history of smoking, alcohol consumption, drug use, or the use of birth control devices or pills. Additionally, the patient denies any history of urinary tract infections or sexually transmitted diseases. She regularly uses betel leaf for vaginal washes at the end of each menstrual period. The patient and her husband have only had one sexual partner and engage in sexual intercourse at least three times per week, avoiding intercourse during menstruation.

A physical examination was conducted, revealing tenderness upon palpation in the right lower quadrant. The patient did not have a fever, and no other abnormalities were detected during internal examination. Blood tests showed no significant abnormalities, with normal leukocyte counts. An ultrasonographic study was performed, revealing a cyst measuring 8.33cm in diameter (Figure 1).



Figure 1. Ultrasonographic Findings; Cyst measuring 8.33cm in diameter.

Cystectomy as a surgical intervention was immediately scheduled (Figure 2), and intraoperative findings revealed that the cyst contained pus, confirming the diagnosis of tubo-ovarian abscess. The remaining abscess tissue was cleaned, and pathological examination revealed the presence of chronic suppurative. Post-operative outcomes were favorable, and the patient was advised to continue taking the prescribed antibiotics orally (Cefixime, Metronidazole and Clindamycin). Two days after the surgery, the patient was discharged for outpatient care.

**Figure 2. Open Surgical Procedure for Abscess Drainage****DISCUSSION**

TOA develops as an infection in the adnexal area, stemming from complications arising from Pelvic Inflammatory Disease (PID) (Kairys & Roepke C, 2024). The primary risk factors for this condition include a history of Pelvic Inflammatory Disease (PID) and Sexually Transmitted Diseases (STDs). The main etiology of this disease is divided into two categories: sexually transmitted microorganisms and non-sexually transmitted microorganisms. *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Trichomonas vaginalis* are the primary etiologies in sexually transmitted spread, whereas *Mycoplasma hominis*, *Escherichia coli*, and *Haemophilus influenzae* are the etiologies of TOA that can be spread without sexual contact (Mitsunami et al., 2023).

In the United States, an estimated 70,000 cases of TOA are diagnosed annually. This number has been declining due to updated guidelines issued by the CDC for the evaluation and treatment of STDs, resulting in a reduced incidence of TOA to approximately 2.3%. Women in the younger age bracket of 15 to 25, particularly those with multiple sexual partners, face the highest risk of developing TOA. Moreover, individuals with compromised immune systems are at significantly greater risk of experiencing severe cases of TOA (Gkrozou et al., 2021; Kairys & Roepke C, 2024).

While the pathophysiology of TOA remains uncertain, certain mechanisms have been proposed, including direct extension of infection, hematogenous spread, and local inflammation leading to abscess formation. Unlike other pelvic infections, TOA often involves polymicrobial agents, complicating its management and prognosis (Kairys & Roepke C, 2024; Munro et al., 2018).

Studies by Puissant et al. emphasize the role of imaging modalities in diagnosing TOA, noting that ultrasonography remains the first-line imaging tool due to its cost-effectiveness and accessibility (Puissant et al., 2023). However, MRI provides superior soft-tissue contrast and

detailed anatomical assessment, especially in ambiguous cases (TOA or ovarian tumors) (Puissant et al., 2023). Additionally, a retrospective study by Zografou et al identified that elevated inflammatory markers such as CRP and ESR could provide early diagnostic clues for TOA in patients without overt symptoms (Kilani et al., 2018).

The variability in clinical presentation adds to the diagnostic challenge of TOA. Studies by Landers and Sweet noted that up to 35% of TOA patients lack fever, while 23% have normal leukocyte counts, aligning with the atypical findings in this case (Zografou Themeli et al., 2022). This highlights the need for high clinical suspicion and the use of advanced diagnostic modalities such as ultrasonography and MRI to confirm TOA in patients without typical symptoms.

Management primarily involves broad-spectrum antibiotic therapy. Research shows that combinations such as Clindamycin with Gentamicin can reduce abscess size by up to 68%, while triple therapy with Ampicillin, Gentamicin, and Clindamycin increases this to 87.5%^{2,6}. However, cases unresponsive to medical therapy may require surgical intervention, which introduces unique challenges, such as tissue fragility and potential for significant bleeding (Guan et al., 2019). Research by Tang et al. compared the effectiveness of different antibiotic regimens, concluding that triple therapy with Ampicillin, Gentamicin, and Clindamycin was more effective in abscess resolution compared to dual therapy (Menezes et al., 2021). For patients unresponsive to antibiotics, minimally invasive surgical interventions, such as laparoscopic drainage, have been shown to reduce complications and hospital stay compared to traditional laparotomy (Tang et al., 2022).

This case of a 32-year-old woman with TOA is unique due to her atypical presentation and significant reproductive implications. While TOA is a known cause of tubal damage and pelvic adhesions leading to infertility, genetic predispositions, as highlighted in studies by Yatsenko and Rajkovic, may also play a significant role. Furthermore, Biswas et al. emphasized the impact of genetic factors on meiotic disruptions, potentially resulting in reproductive challenges (Patil et al., 2024).

Additionally, the patient's prior history of ovarian cysts and possible participation in assisted reproductive technologies, such as IVF, are documented risk factors for TOA. Gao et al. found that spontaneous rupture of ovarian endometriosis cysts and IVF procedures significantly increased TOA risk, with p-values of 0.016 and 0.049, respectively (Tang et al., 2022).

Infertility can be a consequence of TOA. However, inflammation in TOA also plays a crucial role in inducing pregnancy. As highlighted in studies by Chavan, et al. and Gnainsky, et al., inflammation, when regulated, can facilitate pregnancy by enhancing vascular permeability and matrix reorganization (Patil et al., 2024; Zhu et al., 2021). Additionally, this inflammation can aid in facilitating endometrial preparation for the implantation process.¹⁸ In TOA, inflammation levels are notably elevated due to pathogen-induced infections, potentially hindering pregnancy success. Research suggests that infection processes may diminish the implantation rate (Tran & Schimenti, 2019). Furthermore, findings by Gnainsky, et al. underscore the association between heightened inflammation and increased risk of pregnancy complications (Fite et al., 2020).

In this case, TOA not only causes inflammation but can also lead to anatomical distortion.²⁰ Severe anatomical distortion has been shown to cause infertility, as demonstrated in studies by Christiansen, et al and Fite, et al. (Christiansen et al., 2006; Fite et al., 2020) This anatomical distortion can contribute to ovulatory disorders, endometriosis, pelvic adhesions and fibrosis, tubal blockage, Müllerian anomalies, and abnormalities affecting the uterine cavity. Currently, we do not know whether the patient has had TOA for the past 10 years, and we have not found recent studies proving that TOA can remain a silent abscess for such a prolonged period (Zografou Themeli et al., 2022).

Study Limitation

This study is subject to several limitations that warrant consideration. Firstly, the absence of various supporting examinations, such as urinalysis, B-HCG, and CRP, represents a notable gap in the diagnostic approach. The inclusion of these tests could have provided additional valuable insights into the patient's condition and potentially strengthened the diagnostic accuracy. Secondly, the presence of recall bias is a concern. As with any retrospective study relying on patient recall, there exists the possibility of memory distortion or selective recollection, which may have influenced the comprehensiveness and accuracy of the data obtained. Lastly, publication bias is a potential limitation. The study may be susceptible to the tendency for positive or significant findings to be more readily published, while negative or non-significant results may be overlooked or underreported. Recognizing these limitations is critical for interpreting the study findings accurately and for informing future research endeavors.

CONCLUSION

Tubo-Ovarian Abscess (TOA) is a multifaceted condition with significant implications for reproductive health, including infertility caused by inflammation-induced anatomical distortion and abscess formation. Accurate diagnosis requires integrating clinical evaluation with advanced imaging and laboratory testing, while tailored treatment should prioritize effective antibiotic regimens and minimally invasive surgical interventions for unresponsive cases. Preventive strategies, such as STI screening, patient education, and postpartum care, are crucial in reducing TOA incidence. Additionally, early fertility preservation efforts and anti-inflammatory therapies may optimize reproductive outcomes. Multidisciplinary collaboration and adherence to evidence-based protocols are essential for improving diagnostic accuracy, enhancing treatment effectiveness, and minimizing complications in TOA management.

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