Video article - Case report Laparoscopic management of bilateral hydropyosalpinges in an adolescent with delayed diagnosis

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Supplementary material
Video S1: Laparoscopic Management of Bilateral Hydropyosalpinges in an Adolescent with Delayed Diagnosis.
https://youtu.be/vACQ1G3tF4M

ABSTRACT

Purpose: To present the case of an 18-year-old woman with prolonged pelvic pain and elevated inflammatory markers who was successfully managed with combined antibiotic therapy and laparoscopic intervention. This report aims to highlight the importance of timely, expert management and the key role of laparoscopy in both diagnosis and treatment.
Method: Patient presented with a one-month history of intermittent pelvic pain and febrile episodes (up to 38 °C), without a definitive diagnosis or treatment during this period. Laboratory evaluation revealed a markedly elevated serum CA-125 level (850 U/mL). Imaging with ultrasonography and magnetic resonance imaging identified bilateral hydropyosalpinges. Initial management consisted of intravenous cefoxitin and metronidazole combined with oral doxycycline for four days. Diagnostic and therapeutic laparoscopy was subsequently performed, beginning with thorough pelvic visualization. Dense adhesions involving the fallopian tubes and uterus were identified, along with bilateral distended tubes consistent with hydropyosalpinges. Extensive adhesiolysis was performed, followed by drainage of bilateral tubo-ovarian abscesses.
Results: Serum CA-125 levels decreased from 850 to 450 U/mL following antibiotic therapy. Postoperatively, levels declined further to 350 U/mL and normalized to 50 U/mL within one week. The procedure was completed without complications. The patient recovered rapidly, with complete resolution of symptoms and normalization of inflammatory markers.
Conclusion: This case underscores the importance of early, expert intervention in pelvic inflammatory disease, particularly in young patients for whom fertility preservation is paramount. Despite a one-month delay in diagnosis and management, the coordinated use of targeted antibiotic therapy followed by timely laparoscopic surgery by an experienced team resulted in an excellent clinical outcome. Laparoscopy proved invaluable for accurate assessment, effective adhesiolysis, and definitive abscess drainage, highlighting its essential role in modern gynecologic care.

KEYWORDS

Pelvic inflammatory disease, tubo-ovarian abscess, laparoscopy, minimal invasive surgery, PID, TOA, surgery, fertility preservation, hydropyosalpinges.

Introduction

Pelvic inflammatory disease (PID) represents a spectrum of inflammatory disorders of the upper female genital tract, including endometritis, salpingitis, oophoritis, and, in more severe cases, the formation of tubo-ovarian abscesses (TOAs) and advanced tubal collections [1]. The condition most frequently affects women of reproductive age but remains underdiagnosed in adolescents, in whom clinical suspicion is often low and symptoms may be atypical or nonspecific [2]. Hydrosalpinx refers to the chronic accumulation of fluid within an obstructed and inflamed fallopian tube and represents a late sequela of PID, indicating substantial tubal damage. When secondary infection develops within this closed space, the condition progresses to pyosalpinx, which may further evolve into abscess formation and a systemic inflammatory response [3].

The clinical presentation of PID in adolescents can vary widely, ranging from subtle lower abdominal discomfort to a frank acute abdomen. In addition, social stigma or incomplete disclosure of sexual history may further delay diagnosis. In many cases, prolonged or untreated infection leads to irreversible sequelae, including tubal occlusion, extensive pelvic adhesions, chronic pelvic pain, infertility, and an increased risk of ectopic pregnancy [4,5]. Although elevated inflammatory markers and imaging studies support the diagnosis, definitive assessment often requires surgical exploration [5].

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An elevated serum CA-125 level, although classically associated with epithelial ovarian malignancies, may also function as a non-specific marker of peritoneal inflammation and infection, including PID and TOAs [6]. In young women, such elevations may initially mislead clinicians toward oncologic etiologies, thereby delaying appropriate antimicrobial and surgical management. CA-125 values should therefore be interpreted within the appropriate clinical context and supported by imaging findings and overall clinical correlation [7].

Laparoscopy plays a dual diagnostic and therapeutic role in suspected hydropyosalpinges and TOAs [8]. It provides direct access to the pelvic cavity, allows meticulous dissection and abscess drainage, facilitates tubal preservation when feasible, and enables the collection of specimens for microbiological culture and histological examination [9]. Compared with laparotomy, laparoscopy is associated with reduced morbidity, shorter hospital stays, faster recovery, and improved cosmetic outcomes—considerations of particular importance in adolescent patients [10].

This report describes a case of bilateral hydropyosalpinges in an 18-year-old female whose clinical course was complicated by delayed diagnosis and treatment. The case highlights the diagnostic challenges in this age group, the role of CA-125 as an adjunctive marker, the use of empirical antibiotic therapy, and the importance of laparoscopy in achieving definitive management while preserving future fertility potential.

Case presentation

An 18-year-old nulliparous female presented to the gynecology outpatient clinic with a four-week history of intermittent lower abdominal pain and febrile episodes reaching up to 38 °C. The pain was predominantly localized to the bilateral iliac fossae, cramping in nature, and occasionally radiated to the lower back. She denied gastrointestinal symptoms such as diarrhea or vomiting and reported no urinary complaints. Her menstrual cycles were regular, with no dysmenorrhea or intermenstrual bleeding. The patient reported no sexual activity in the preceding months and had no known history of sexually transmitted infections or prior pelvic surgery.

On clinical examination, the patient appeared mildly ill but was hemodynamically stable. Abdominal palpation revealed bilateral lower-quadrant tenderness without signs of peritonitis. Pelvic examination was deferred because of patient discomfort and lack of prior sexual activity. Transabdominal ultrasonography demonstrated bilateral adnexal cystic masses with internal septations and echogenic debris, consistent with complex fluid-filled structures. Further evaluation with magnetic resonance imaging (MRI) confirmed the presence of bilateral hydropyosalpinges, characterized by elongated, thick-walled tubular structures with restricted diffusion and heterogeneous signal intensity. No solid adnexal masses were identified.

Laboratory investigations revealed leukocytosis (13,200/μL), elevated C-reactive protein (CRP; 78 mg/L), and a markedly elevated serum CA-125 level of 850 U/mL. Serologic and microbiological testing for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* were negative. Blood and urine cultures also yielded no growth. Based on the combined imaging and laboratory findings, a diagnosis of bilateral tubo-ovarian abscesses secondary to subacute pelvic inflammatory disease was established.

The patient was admitted and initiated on intravenous cefoxitin (2 g every 6 hours), intravenous metronidazole (500 mg every 8 hours), and oral doxycycline (100 mg twice daily). After four days of antimicrobial therapy, the patient became afebrile, abdominal pain improved, and serum CA-125 levels decreased to 450 U/mL. Despite clinical improvement, repeat imaging demonstrated persistent adnexal collections without significant reduction in size. A decision was therefore made to proceed with diagnostic and therapeutic laparoscopy.

Intraoperatively, the pelvis was markedly inflamed, with extensive adhesions involving the uterus, fallopian tubes, and surrounding peritoneum. Both fallopian tubes were severely distended, tortuous, and adherent to adjacent structures. Careful adhesiolysis was performed to restore normal pelvic anatomy. Each hydropyosalpinx was incised longitudinally, and approximately 50 mL of purulent fluid was aspirated from each side. Samples were obtained for microbiological culture. The pelvic cavity was irrigated with warm saline, and a drain was placed in the posterior cul-de-sac.

The patient tolerated the procedure well and was discharged on postoperative day two after continuation of antibiotic therapy. At follow-up visits at 10 days and one month, she remained asymptomatic, with normalization of inflammatory markers and a serum CA-125 level of 50 U/mL. Pelvic ultrasonography at one month demonstrated no residual fluid collections. The patient received counseling regarding future fertility, risk of recurrence, and strategies for contraception and prevention of sexually transmitted infections.

Discussion

This case underscores the clinical challenges inherent in managing PID in adolescents, particularly when diagnosis and treatment are delayed. The progression to bilateral hydropyosalpinges with subsequent development of tubo-ovarian abscesses represents a severe manifestation of PID, carrying substantial implications for future reproductive capacity. PID remains a common cause of gynecologic morbidity, with well-recognized long-term sequelae including infertility, ectopic pregnancy, and chronic pelvic pain [11]. In adolescents, a lower index of clinical suspicion and atypical or nonspecific presentations frequently contribute to delayed diagnosis and treatment, thereby amplifying the risk of these adverse outcomes [12].

Hydropyosalpinx reflects an advanced stage in the natural history of PID and is characterized by complete tubal occlusion with accumulation of serous or purulent fluid. When diagnosis is postponed, ongoing inflammation promotes tissue necrosis,

fibrosis, and adhesion formation, further compromising tubal function. In the present case, the markedly elevated CA-125 level initially raised concern for an underlying neoplastic process. However, elevated CA-125 levels in premenopausal patients are nonspecific and, in the context of infection and inflammation, may be observed in conditions such as tubo-ovarian abscesses, endometriosis, and peritonitis [13]. Although antibiotic therapy remains the cornerstone of PID management, medical treatment alone may be insufficient in selected cases, particularly in the presence of bilateral disease, large abscesses, or an incomplete clinical response.

Laparoscopy is not routinely indicated for the diagnosis of PID, as current guidelines emphasize a primarily clinical diagnosis supported by laboratory and imaging findings. Nevertheless, in selected patients with atypical presentations, inadequate response to medical therapy, or when fertility preservation is a major consideration, laparoscopy offers significant additional benefit. It enables direct visualization of pelvic pathology and allows timely therapeutic intervention, including adhesiolysis and abscess drainage, while maximizing the potential for preservation of reproductive structures [14].

The present case illustrates the clinical value of a timely transition from conservative to surgical management. Prolonged conservative therapy or delayed surgical referral may result in irreversible tubal damage, extensive adhesions, or serious complications such as rupture and sepsis [3]. By contrast, early laparoscopic intervention following a brief course of antimicrobial therapy in this adolescent patient not only achieved infection control but also optimized the likelihood of future fertility preservation. The laparoscopic approach affords superior visualization, targeted drainage, and careful tissue handling, thereby minimizing iatrogenic injury and facilitating postoperative recovery. These considerations highlight the importance of individualized management strategies and maintaining a low threshold for surgical intervention in adolescents with persistent or severe PID-related complications.

Accordingly, the originality of this report lies not in the presentation of a novel technique, but in emphasizing the critical role of timely laparoscopy in carefully selected young patients, where the timing of surgical intervention may determine the difference between preserved fertility and irreversible reproductive damage. This message is particularly relevant to routine clinical practice, reinforcing the need to tailor PID management to both disease progression and the patient's reproductive potential.

Conclusions

This case highlights the complexity and severity of untreated pelvic inflammatory disease in adolescents, culminating in bilateral hydropyosalpinges and tubo-ovarian abscesses. Diagnostic ambiguity, often compounded by elevated tumor markers and atypical clinical presentations, necessitates a high index of suspicion. Although imaging studies are valuable, they may be insufficient in advanced disease, and reliance on noninvasive approaches alone can delay definitive care. In this context, laparoscopy serves as a crucial tool, providing both diagnostic confirmation and precise therapeutic intervention, including adhesiolysis, abscess drainage, and preservation of reproductive structures.

In the present case, coordinated treatment with broad-spectrum antibiotics followed by laparoscopic surgery resulted in rapid clinical and biochemical resolution despite a significant diagnostic delay. These findings emphasize the importance of early multidisciplinary involvement in similar presentations and reaffirm the role of laparoscopy in the management of complex pelvic infections, particularly in young patients for whom fertility preservation is a primary concern. Structured postoperative follow-up, fertility counseling, and preventive strategies aimed at reducing recurrence remain essential components of comprehensive care.

Abbreviations

The following abbreviations are used in this manuscript:

PID: Pelvic inflammatory disease
TOAs: Tubo-ovarian abscesses
MRI: Magnetic Resonance Imaging
STIs: Sexually transmitted infections

References

1. Wiesenfeld HC, Sweet RL. Progress in the Management of Tuboovarian Abscesses. Clin Obstet Gynecol. 1993;36(2):433-444.
2. Haggerty CL, Ness RB. Diagnosis and Treatment of Pelvic Inflammatory Disease. Women's Health. 2008;4(4):383-397.
3. Granberg S, Gjelland K, Ekerhovd E. The management of pelvic abscess. Best Pract Res Clin Obstet Gynaecol. 2009;23(5):667-678.
4. Peipert JF. Genital Chlamydial Infections. NEJM. 2003;349(25):2424-2430.
5. Trent M, Haggerty CL, Jennings JM, Lee S, Bass DC, Ness R. Adverse Adolescent Reproductive Health Outcomes After Pelvic Inflammatory Disease. Arch Pediatr Adolesc Med. 2011;165(1):49-54.
6. Meden H, Fattahi-Meibodi A. CA 125 in Benign Gynecological Conditions. Int J Biol Markers. 1998;13(4):231-237.
7. Moss EL, Hollingworth J, Holland M, Murphy DJ, Fernando I, Reynolds TM. The use and understanding of CA125 as a tumor marker for ovarian cancer: a questionnaire-based survey. Int J Gynecol Cancer. 2008;18(3):439-445.
8. Lamvu G, Tu F, As-Sanie S, Zolnoun D, Steege JF. The role of laparoscopy in the diagnosis and treatment of conditions associated with chronic pelvic pain. Obstet Gynecol Clin North Am. 2004;31(3):619-630.
9. Buchweitz O, Malik E, Kressin P, Meyhoefer-Malik A, Diedrich K. Laparoscopic management of tubo-ovarian abscesses. Surg Endosc. 2000;14(10):948-950.
10. Adamyan LV. Minimally invasive surgery in gynecologic practice. Int J Gynaecol Obstet. 2003;82(3):347-355.
11. Haggerty CL, Taylor BD. Mycoplasma genitalium: An Emerging Cause of Pelvic Inflammatory Disease. Infect Dis Obstet Gynecol. 2011;2011:959816.

12. Trent M, Bass D, Ness RB, Haggerty C. Recurrent PID, Subsequent STI, and Reproductive Health Outcomes: Findings From the PID Evaluation and Clinical Health (PEACH) Study. Sex Transm Dis. 2011;38(9):879-881.
13. Charkhchi P, Cybulski C, Gronwald J, Wong FO, Narod SA, Akbari MR. CA125 and Ovarian Cancer: A Comprehensive Review. Cancers (Basel). 2020;12(12):3730.
14. Charvériat A, Fritel X. [Diagnosis of pelvic inflammatory disease: Clinical, paraclinical, imaging and laparoscopy criteria. CNGOF and SPILF Pelvic Inflammatory Diseases Guidelines]. Gynecol Obstet Fertil Senol. 2019;47(5):404-408.

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