

A Challenging Case of TLH in a Frozen Pelvis with Bilateral Tubo-Ovarian Abscess and Multiple Site Hernia

¹Dr. Rumi Bhattacharjee; ²Dr. Riddhi Bhorania; ³Dr. Dipal Shah;

⁴Dr. Sheetal Shahu; ⁵Dr. Bhoomika; ⁶Dr. Rashmita Pal

¹MD. Professor, ²MS. 2nd year resident, ³MD. Assistant Professor, ⁴MS. Senior Resident, ⁵DNB. Senior Resident

^{1,2,3,4,5,6} Obstetrics and Gynaecology, Pramukhswami medical college, Bhaikaka university, Karamsad, Anand, Gujarat, India

Corresponding Author: **Dr. Rumi Bhattacharjee**

Abstract

Widely adopted for its efficacy, total laparoscopic hysterectomy (TLH) is notable for minimizing discomfort and promoting a quicker return to normal activities than conventional open surgical techniques. Nonetheless, the presence of a frozen pelvis—marked by extensive adhesions and scar tissue, often resulting from prior pelvic surgeries, endometriosis, or chronic inflammation—poses considerable challenges. Performing a TLH in such a setting necessitates meticulous preoperative evaluation and highly skilled surgical expertise. Surgeons must anticipate prolonged operative times and potential complications, given the complexity of tissue dissection and the obscured anatomical planes. We present the case of a 42-year-old woman, gravida 2, para 2, with a history of two previous cesarean sections, who presented with acute abdominal pain and sepsis, compounded by poorly controlled diabetes and hypertension. Exploratory laparoscopy revealed a frozen pelvis complicated by a tubo-ovarian abscess and multiple hernias at various sites. The pelvic structures were obscured, enveloped by omentum and bowel, with severe adhesions to the sigmoid colon. In light of these findings, the patient underwent definitive treatment with a total laparoscopic hysterectomy (TLH) accompanied by bilateral salpingo-oophorectomy and excision of the abscess.

Keywords: Laparoscopic hysterectomy, adhesiolysis, tubo-ovarian mass, umbilical hernia, frozen pelvis, pelvic inflammatory disease, abscess

Synopsis: This case highlights the benefits of minimally invasive surgery in treating frozen pelvis with co-morbidities, avoiding the drawbacks of open surgery, and ensuring better recovery.

Total number of photographs: 6

Presentation at a meeting: None

Ethical Considerations: To address ethical issues, we ensured absolute confidentiality of patient records. The study commenced following approval from the institutional ethics committee. No: IEC/BU/2024/Cr.60/325/2024. A consent form was obtained from the patient for the same.

- The authors declare that there is no conflict of interest and no funding was obtained.
- The manuscript has been read and approved by all the authors, and all authors meet the authorship criteria. This is an original and honest work.
- The study conforms to the latest Helsinki Declaration norms.

Introduction

The advent and progress of laparoscopy over the last two decades have revolutionized the art of surgery. Complex operations can be accomplished by accessing a couple of holes, offering minimal discomfort and maximum benefit to the patient.

Performing a hysterectomy in the presence of a frozen pelvis is a formidable surgical challenge, whether approached through laparotomy or laparoscopy. A frozen pelvis denotes a surgical scenario in which the reproductive organs and surrounding structures are severely distorted due to extensive adhesions and fibrosis.¹ This distortion renders critical anatomical landmarks and surgical planes indefinable, significantly complicating dissection and increasing the risk of damage to vital organs. The most common causes of a frozen pelvis include infections, endometriosis, and multiple previous surgeries, though other factors such as ovarian carcinoma and prior radiotherapy may also play a role. Surgical intervention in this context carries a heightened risk of serious complications, including injury to the bowel and urinary tract.²

The approach to hysterectomy in a frozen pelvis involves two sequential steps: conducting thorough adhesiolysis initially and then removing the uterus. Our approach included clearing the operative field to enable visualization of the uterus, commencing the steps of hysterectomy, and dealing with the posterior bowel adhesions at a later stage. The following case underscores the pivotal role of minimally invasive surgery in a challenging case with several medical co-morbidities, wherein the disadvantages of open surgery could be avoided while offering better post-operative recovery and recuperation.

Case report

A 44-year Para 2 Living 2 with long-standing PID with previous 2 LSCS in a known case of Diabetes Mellitus (DM) type 2, hypertension, and hypothyroidism presented to our center with complaints of severe lower abdominal pain associated with lower backache, respiratory distress, and anorexia since past 10 days. She also complained of menorrhagia, passage of clots, and fullness of the stomach. On evaluation, she reported a past history of wound gap and poor wound healing in her last cesarean, attributable to her co-morbidities.

On examination, the patient looked ill, had a fever and tachycardia, and her abdomen had generalized obesity and tenderness. On p/v examination, the cervix was high up with forniceal tenderness.

Laboratory investigations revealed elevated inflammatory markers like leucocytosis, a high CRP of 87, HbA1C – 10.7, and CEA – 0.88. and a deranged lipid profile.

A pelvic sonoscan displayed a right adnexal mass of 9.8x4.9x4.7 cm suggestive of changes of right tubo-ovarian infective collection with the largest collection measuring 3x3x3 cm (approx. vol 15-20 cc). A collection of infective origin was conveyed in the POD along with bilateral hydrosalpinxes. A CT of the abdomen was ordered, which concluded a right-sided abscess with infarction or necrosis of ovarian parenchyma along with severe inflammatory changes in the lower abdomen and pelvis. There were also changes of chronic cystitis along with pelvic and retroperitoneal lymphadenopathy. Umbilical, incisional, and inguinal hernia were also noted. Broad-spectrum antibiotics were initiated, and a laparoscopic procedure was decided.

Laparoscopic findings: Primary port entry was acquired through Parmar's point in anticipation of intraperitoneal adhesions. Three accessory ports were acquired. Severe adhesions were encountered between the anterior abdominal wall omentum and bowel. A completely frozen pelvis was visualized along with all three inguinal, umbilical, and incisional hernia. A thick curtain of bowel and omental adhesions precluded visualization of the uterus (Fig:1). A huge tubo-ovarian mass with purulent exudate was noted on the right side (Fig:2). Both fallopian tubes appeared oedematous with evidence of acute salpingitis. Dense adhesions were present between the fallopian tubes and ovaries on both sides. The rectum was adherent on the posterior wall of the uterus and right adnexa (Fig:3), (Fig:4). Compounding the complexity were the multiple hernias in the patient. These hernias involved the inguinal region, abdominal wall, and incisional sites and significantly limited access to the surgical field. Each hernia was assessed to determine the optimal approach for repair, which could necessitate concurrent hernia surgery.

Adhesiolysis was commenced to free the anterior abdominal wall from the bowel and omentum. The entire pelvis, along with the uterus, appeared inflamed and congested (Fig:5). A decision was taken for total clearance of the abscess and all necrotic tissue. A bipolar shearer was used to release the uterus from surrounding adhesions and initiate

a hysterectomy. Meticulous dissection was carried out to separate the densely adhered bladder from the cervix. The ureter on the right side was traced along its course to ensure its preservation. A total laparoscopic hysterectomy was accomplished with left salpingo-oophorectomy. Posteriorly, the rectum was mobilized and freed from the right adnexa. The right TO mass was densely adherent and amalgamated with caecum, and separation was achieved carefully and with great difficulty. Thick pus drained from the TO mass during dissection, which was suctioned out (Fig:6). In collaboration with surgeons, a 2*2 cm umbilical defect was identified, having an omentum and bowel adherent to it. Adhesiolysis was achieved, and the contents were released from the umbilical and previous incisional hernias. The surgery concluded with a thorough pelvic lavage and confirmation of hemostasis.

Histopathological analysis indicated the presence of an intramural leiomyoma accompanied by signs of chronic cervicitis, as well as a hemorrhagic corpus luteal cyst in the right ovary. Pus culture revealed growth of E coli.

Treatment Course: Postoperatively, the patient was placed on a regimen of high-dose antibiotics and maintained under strict glycaemic control. Despite several comorbidities, the recovery process was uneventful, and by the time of discharge, the patient was in excellent health, radiating happiness and motivation.

Discussion

TOA (Tubo-ovarian abscess) encompasses the collection of pus in the adnexal structures, namely tubes, and ovaries, which can lead to peritonitis and septicemia if left untreated, ultimately culminating in multiorgan failure and mortality.³ Pelvic inflammatory disease (PID) and tubal ovarian abscess (TOA), while not particularly rare, can infrequently manifest as surgical emergencies. This case report underscores the critical signs, symptoms, and risk factors to consider when a patient presents with indications of sepsis and an acute abdominal condition. PID is characterized by a bacterial infection of the upper genital tract, with *Neisseria gonorrhoeae* and *Chlamydia trachomatis* being the most prevalent causative agents. Less commonly, *Mycoplasma genitalium* and enteric pathogens such as *Escherichia coli* may also be implicated.⁴

There is limited definitive guidance on managing tubo-ovarian abscesses; however, it is suggested that intravenous antibiotics, coupled with interventional radiological drainage, may be appropriate for abscesses measuring less than 5 cm.^{3,5} Conversely, laparoscopic drainage is recommended for abscesses larger than 5 cm.⁶

Most hysterectomies can be effectively performed laparoscopically, including those complicated by large myomas and severe endometriosis.⁷ While various techniques have been developed to address challenging hysterectomies, the expertise required often restricts their widespread application.^{8,9} Laparoscopic hysterectomy is particularly advantageous in cases of frozen pelvis, as it allows for more effective removal of the adnexa. In contrast, during vaginal hysterectomies, the adnexa may be

adherent to surrounding structures, making access exceedingly difficult through the transvaginal approach.⁸

Adnan Orhan et al. observed a significant increase in the ratio of total laparoscopic hysterectomies (TLHs) among all hysterectomies, rising from 2.4% in 1995 to 44.7% in 2018—an impressive 33-fold increase over 24 years. Furthermore, the proportion of obese patients undergoing TLH rose from 1% to 37%. The rate of patients with three or more prior laparotomies increased from 0% to 32.2%. In contrast, the percentage of patients with uterine specimens weighing over 500 grams in laparoscopic hysterectomy cases surged from 0% to 32.8%.¹⁰ Laparoscopy was found to offer the benefits of better wound healing and mobility in patients with morbid obesity and concurrent comorbidities such as uncontrolled diabetes.

The laparotomy conversion rate for laparoscopic hysterectomy in severe endometriosis and large fibroids, as described in the literature, is 4.3 and 7.9 %^{7,11}

According to Mahmaud et al., surgical outcomes reveal significant differences between total laparoscopic hysterectomy (TLH) and abdominal hysterectomy (AH). TLH demonstrated a shorter mean operative time, less intraoperative blood loss, and a reduced need for postoperative analgesics. Additionally, patients who underwent TLH experienced a shorter hospital stay, with minimal wound complications compared to the severe complications observed in AH cases.¹²

Notably, the patient in our case, requiring emergency surgery, presented with fever, sepsis, and poor glycaemic control, highlighting the potential risks that could be associated with abdominal hysterectomy. Initial efforts were focused on careful adhesiolysis and identification of the bilateral tubo-ovarian abscesses, followed by their drainage. The frozen pelvic anatomy necessitates extensive manipulation of the surrounding organs and tissues. Simultaneously, an assessment of the hernia sites is necessary to ensure their management and eventual repair during the procedure. A high level of vigilance is required to mitigate complications such as bleeding, bowel or urinary tract injury, and sepsis. In a similar case report, Yavuz Simsek et al described a successful laparoscopic excision of a large tubo-ovarian abscess in a young female.¹³ Overall, laparoscopic approaches like TLH are favored for their minimal postoperative complications, improved wound healing, and faster recovery times, making them a more advantageous option for patients.

Chu et al. reported a remarkable response rate of 90-100% for laparoscopic treatment in cases of tubo-ovarian abscess, with no severe complications observed.¹⁴

Despite the added challenges and risks, TLH remains a viable and effective surgical approach for patients with a frozen pelvis. Satisfactory outcomes can be attained by employing advanced techniques and exercising meticulous surgical management. Ongoing research and technological innovations are crucial for further improving the safety and efficacy of TLH in this complex setting.

Conclusion

Although a frozen pelvis is not a common surgical condition, it is not infrequently encountered in clinical practice. Our approach, beginning with partial adhesiolysis, followed by hysterectomy, retrograde separation of posterior bowel adhesions, and subsequent adnexal removal, provides an alternative technique for managing these complex cases. A deep understanding of pelvic anatomy and the ability to navigate unexpected complications is indispensable in these complex surgeries. The minimally invasive approach offers significant advantages over traditional open surgery, including a faster recovery time and reduced postoperative pain.

References

1. Donald PG, Michael JC (2007) Surgical strategies to untangle a frozen pelvis. *OBG Management* 19(3)
2. Hudson CN. Victor Bonney Lecture, 1980. Ovarian cancer--a gynaecological disorder. *Annals of The Royal College of Surgeons of England*. 1981 Mar;63(2):118.
3. Curry A, Williams T, Penny ML. Pelvic Inflammatory Disease: Diagnosis, Management, and Prevention. *Am Fam Physician*. 2019 Sep 15;100(6):357-364. PMID: 31524362.
4. Brunham RC, Gottlieb SL, Paavonen J. Pelvic inflammatory disease. *New England Journal of Medicine*. 2015 May 21;372(21):2039-48.
5. Savaris RF, Fuhrich DG, Maissiat J, Duarte RV, Ross J. Antibiotic therapy for pelvic inflammatory disease. *Cochrane Database of Systematic Reviews* Rev. 8 (80 (2020) p. Cd10285
6. Kairys N.R.C. StatPearls; 2022. Tubo-Ovarian Abscess. Available from: Available from
7. Chalermchockchareonkit A, Tekasakul P, Chaisilwattana P, Sirimai K, Wahab N. Laparoscopic hysterectomy versus abdominal hysterectomy for severe pelvic endometriosis. *International Journal of Gynecology & Obstetrics*. 2012 Feb;116(2):109-11.
8. Pelosi MA III, Pelosi MA. Vaginal hysterectomy for benign uterine disease in the laparoscopically confirmed frozen pelvis. *Journal of Laparoendoscopic & Advanced Surgical Techniques*. 1997 Dec;7(6):345-51.
9. Cho FN. A technique to deal with severe adhesions between the uterus and bladder or rectum in laparoscopic-assisted vaginal hysterectomy. *Journal of Minimally Invasive Gynecology*. 2007 Nov 1;14(6):750-1.
10. Orhan A, Ozerkan K, Kasapoglu I, Ocakoglu G, Cetinkaya Demir B, Gunaydin T, Uncu G. Laparoscopic hysterectomy trends in challenging cases (1995-2018). *J Gynecol Obstet Hum Reprod*. 2019 Dec;48(10):791-798.
11. Moon JM, No JH, Jeon YT, Jee BC, Kim YB. Clinical outcomes of 1,041 total laparoscopic hysterectomies: Six years of experience in a single center. *Korean Journal of Obstetrics & Gynecology*. 2011 Oct 1;54(10):618-22.

12. Mahmaud-Aboufotouh, M.E., Chaalan, F. & Mohammed, A.F. Laparoscopic hysterectomy versus total abdominal hysterectomy: a retrospective study at a tertiary hospital. *Gynecol Surg* 17, 1 (2020).
13. Simsek Y. Definitive laparoscopic treatment of huge tubo-ovarian abscess: Report of a difficult case. *Ahi Evran Med J.* 2020;4(2):56-59.
14. Chu L, Ma H, Liang J, Li L, Shen A, Wang J, Li H, Tong X. 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.

Fig:1 Laparoscopic picture on entry

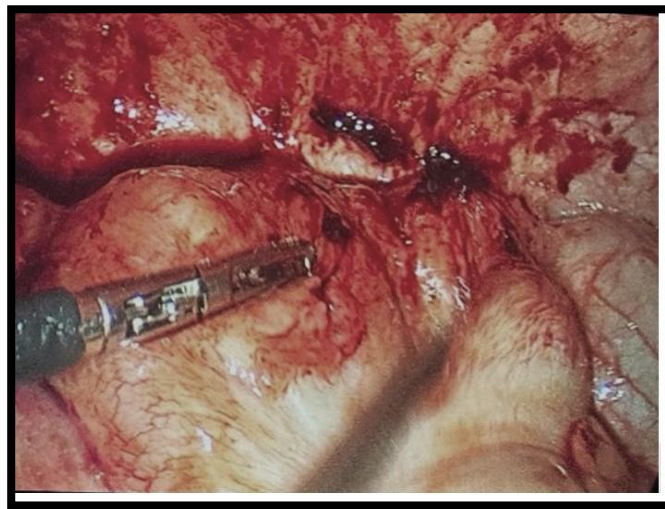


Fig: 2 Tubo-ovarian mass

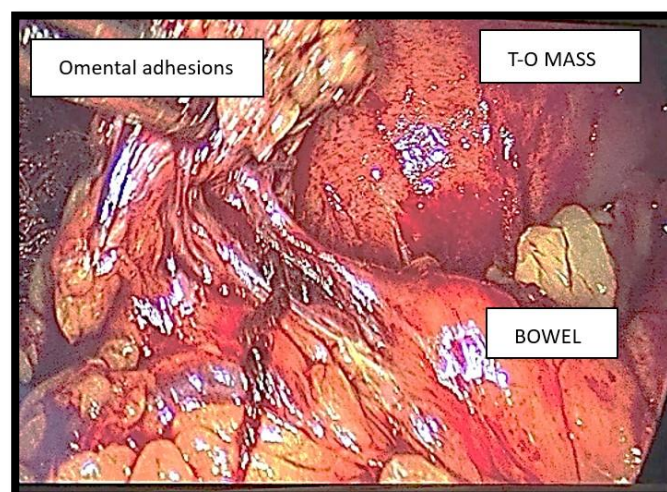


Fig: 3 Dense pelvic adhesions

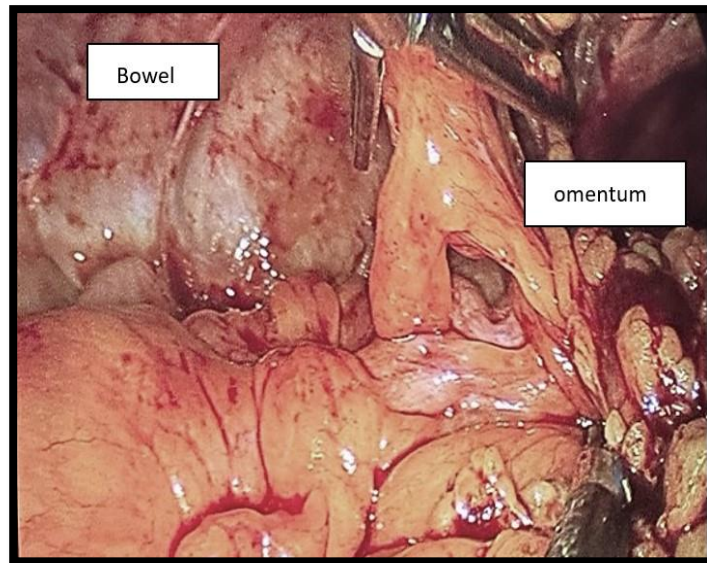


Fig: 4 Dense bowel adhesions

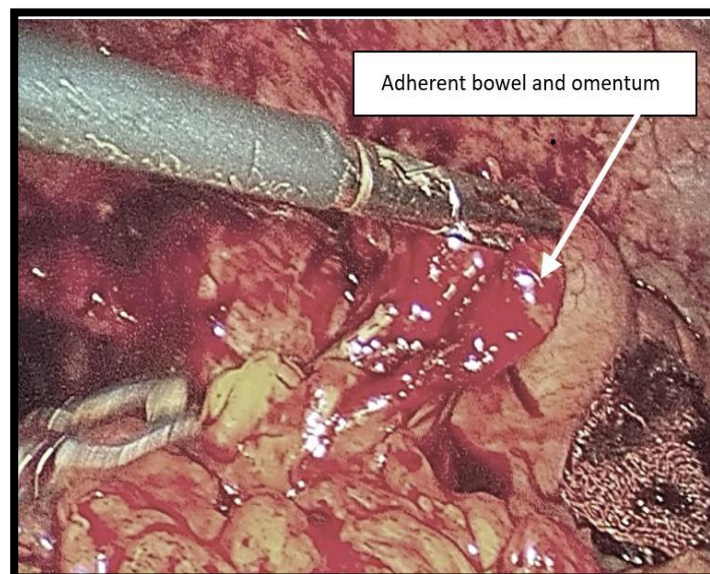


Fig: 5 Inflamed pelvic structures

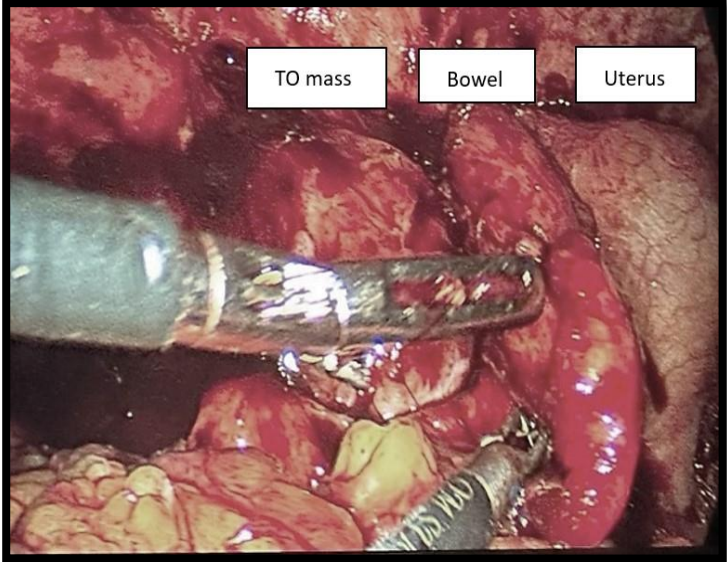


Fig: 6 Ruptured TO Mass with pus

