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CASE REPORT

Spontaneous Uterine Perforation Presenting with Acute Abdominal Pain is a Rare Gynecologic Emergency Condition: Three cases report

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ABSTRACT

Uterine perforation is a rare but serious gynecologic condition, most commonly associated with induced procedures. However, spontaneous uterine perforation due to infection and pyometra has been reported, though data is limited. Severe complications, including purulent peritonitis and sepsis, can lead to high morbidity and mortality rates.

This case report presents three patients admitted to Lerdsin Hospital with generalized peritonitis, requiring emergency surgery, and diagnosed with spontaneous uterine perforation. The patients had distinct clinical courses and final diagnoses, including necrotizing endometritis, advanced cervical cancer, and endometrial carcinoma. Despite varying clinical courses, all patients had favorable outcomes with timely intervention.

Spontaneous uterine perforation is a life-threatening condition with high morbidity and mortality, requiring consideration in acute peritonitis diagnosis. In order to avoid lethal consequences, optimal management is essential, which includes early detection and timely surgery.

Keywords: pyometra, spontaneous uterine perforation, acute abdominal pain, generalized peritonitis, septic shock.

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อาการปวดท้องฉุกเฉินจากมดลูกทะลุ ภาวะที่พบได้น้อยในทางนรีเวช

นิธิสา ตะพานวงศ์

บทคัดย่อ

ภาวะมดลูกทะลุเป็นภาวะฉุกเฉินทางนรีเวชที่พบการรายงานได้น้อย โดยปกติมดลูกทะลุมักเกิดจากการทำหัตถการทางการแพทย์ เช่น การขูดมดลูก การส่องกล้องโพรงมดลูก การใส่ห่วงอนามัย หรือการฝังแร่ในช่องคลอดเพื่อรักษามะเร็ง เป็นต้น ภาวะมดลูกทะลุจากปัจจัยอื่น มักมีสาเหตุนำจากการตีบตันของปากมดลูก เกิดมดลูกอักเสบติดเชื้อและเกิดของเหลวร่วมกับหนองสะสมขึ้นภายในโพรงมดลูก จนกระทั่งมีการทะลุของชั้นกล้ามเนื้อมดลูกตามมา

จากการทบทวนวรรณกรรมที่มีการรายงานภาษาอังกฤษ ย้อนหลังพบการรายงานผู้ป่วยมดลูกทะลุจากมดลูกติดเชื้อเพียงส่วนน้อย เพื่อที่จะเพิ่มความระมัดระวังในการวินิจฉัยและรักษา ทางผู้วิจัยจึงนำเสนอรายงานผู้ป่วย 3 ราย ที่เข้ารับการรักษาในโรงพยาบาลเลิดสิน และได้รับการวินิจฉัยมดลูกทะลุ ผู้ป่วยทั้ง 3 รายนำมาด้วยอาการปวดท้องเฉียบพลัน โดยรายงานผู้ป่วย นำเสนออาการแสดง ภาวะแทรกซ้อน การรักษา และผลพยาธิวิทยา ที่แตกต่างกันในผู้ป่วยแต่ละราย ได้แก่ เยื่อบุโพรงมดลูกอักเสบอย่างรุนแรง มะเร็งปากมดลูก และมะเร็งเยื่อบุโพรงมดลูก โดยผู้ป่วยทั้งสามรายได้รับการรักษาอย่างเร่งด่วนและผู้ป่วยสามารถรอดชีวิตจากภาวะวิกฤต

โดยสรุป ภาวะมดลูกทะลุ เป็นภาวะฉุกเฉินที่เกิดภาวะแทรกซ้อนอื่นๆตามมาสูง ไปจนถึงมีอัตราการเสียชีวิตสูง อาการแสดงอาจคล้ายอาการทะลุของระบบทางเดินอาหาร ดังนั้นการวินิจฉัยแยกโรคก่อนผ่าตัดควรพึงระลึกถึงภาวะนี้ในสตรีที่มาด้วยอาการปวดท้องเฉียบพลัน

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Introduction

Uterine perforation is a rare gynecologic condition, most frequently associated with obstetrical and gynecological procedures, including uterine curettage, hysteroscopy, intrauterine device insertion, and brachytherapy for cervical cancer treatment. However, spontaneous uterine perforation has been reported in association with uterine infection, followed by pyometra. Pyometra is the persistent collection of purulent material within the uterine cavity resulting from impaired natural drainage due to cervical stenosis[1]. The reported incidence of pyometra ranges from 0.13-0.4% among gynecological patients, with a notably higher prevalence of 13.6% in older women. This condition may arise secondary to malignancy and their associated treatment or as a consequence of benign pathologies such as cervical polyp and age-related cervical stenosis[2, 3]. The classical clinical manifestations of pyometra include uterine bleeding, especially in the postmenopausal age group, vaginal discharge, uterine enlargement, and cramping pain. However, asymptomatic cases have been reported in approximately 50% of patients[4]. Rare but serious complications include purulent peritonitis and sepsis, both of which are associated with significantly high morbidity and mortality[2, 5].

To date, fewer than 50 cases of spontaneous uterine perforation of pyometra have been reported in the English literature, and a limited number of cases have been documented in Thailand[6, 7]. Here, presenting a case series of three patients diagnosed with spontaneous uterine perforation complicated by generalized peritonitis who were admitted to Lerdsin Hospital.

Case 1

A 52-year-old nulliparous woman presented with acute abdominal pain and fever persisting for three days, and her pain worsened in the preceding two hours. She reported no abnormal uterine bleeding, abnormal vaginal discharge, or history of prior pelvic examinations. Upon arrival at the emergency department, she exhibited signs of septic shock, including fever (38°C), hypotension (76/48 mmHg), and pulse rate of 64 beats/min. Immediate fluid resuscitation and broad-spectrum antibiotics were initiated. Physical examination revealed generalized abdominal tenderness with peritonitis, while pelvic examination identified a cervical mass with minimal bleeding and thickening parametrium bilaterally.

Transvaginal ultrasonography demonstrated a normal-sized uterus without intrauterine fluid collection or an adnexal mass, but the free fluid was detected in the pelvic cavity. Acute abdomen series imaging showed no evidence of pneumoperitoneum or hollow viscus organ perforation. A computed tomography (CT) scan was performed, but an official report was pending. The initial gynecologic assessment raised suspicion of primary peritonitis due to hollow viscus organ perforation, with the exophytic cervical mass deemed unrelated to the acute presentation. A general surgeon consultation was obtained, and an emergency diagnostic laparoscopy was performed after informed consent.

The intraoperative findings revealed an intact bowel loop, uterine fundal perforation with purulent discharge, and foul-smelling pus in the cul de sac. The peritoneal cavity was irrigated, and a closed-suction drain was placed in the cul de sac. Postoperative CT imaging officially confirmed a 3-cm cervical mass causing uterine obstruction, secondary pyometra, and rupture of the uterine fundus with intraperitoneal free air. (Fig. 1)

The patient underwent pus drainage and received a 14-day course of intravenous ceftriaxone and metronidazole. Hemoculture and pus cultures were negative for pathogens. She demonstrated clinical improvement and was discharged on postoperative day 15.

Fig. 1. Computed tomography in the sagittal view presented a ruptured fundal wall of the uterus (arrow).

Management was guided by the cervical punch biopsy, which revealed metastatic low-grade serous carcinoma favoring a tubo-ovarian origin, with imaging confirmed bone metastases at T11-12. The patient underwent neoadjuvant platinum-based chemotherapy (four cycles), followed by cytoreductive surgery, including abdominal hysterectomy with bilateral salpingo-oophorectomy. The primary goal of surgery was optimal tumor debulking, aiming for no residual disease, as in the management of advanced ovarian cancer. Pelvic lymphadenectomy was omitted due to its lack of survival benefit and associated surgical risks. Intraoperatively, cervical malignancy was suspected due to left parametrium involvement. However, radical hysterectomy was contraindicated due to the high risk of left ureteric injury. Final pathology confirmed adenocarcinoma of the cervix (p16 positive), leading to a revised diagnosis of advanced cervical malignancy with bone metastases. After completing six cycles of chemotherapy, the patient was referred for adjuvant radiotherapy.

The patient remained in good clinical condition, with stable bone disease and no evidence of local recurrence or new metastases on follow-up imaging. The progression-free interval was 11 months post-treatment.

Case 2

A 47-year-old nulliparous Thai woman presented with a palpable abdominal mass persisting for one month and sought emergency care due to acute severe abdominal pain. Her vital signs were stable, and she was afebrile on her first hospital visit. Abdominal examination revealed generalized tenderness with peritonitis and a palpable pelvic mass. Bedside transabdominal and transvaginal ultrasonography identified a heterogeneous echogenic mass within the myometrium, measuring 13 × 10 cm, with no identifiable endometrial lining. Additionally, free fluid and a collapsed inferior vena cava were detected in the hepatorenal space, raising concerns about hemodynamic instability. Initial management included fluid resuscitation and further investigation through CT. The patient was admitted under the care of a general gynecologist.

During observation in the gynecologic unit, the patient developed respiratory failure, necessitating intubation and transfer to the intensive care unit. A computer tomography pulmonary angiography (CTPA) ruled out pulmonary embolism but revealed significant

free intraperitoneal fluid and pneumoperitoneum. While awaiting the official CT report, she developed a high-grade fever (39-40°C) and exhibited clinical signs of septic shock with respiratory and hepatorenal failure. An urgent consultation with the gynecologic oncology team was obtained, and emergency exploration surgery was performed.

Intraoperative findings revealed purulent fluid in the abdominal cavity. The uterus was markedly enlarged, measuring 18 x12 x 8 cm, with an infected necrotic tumor (7 x 8 cm) at the fundus (Fig. 2). The uterine cavity contained friable tissue and foul-smelling pus. The tumor was adhered to bowel loops, and the omentum densely covered the pelvic organs. Additional friable tissue was identified at the mesentery and bowel loops. The procedure involved a total abdominal hysterectomy with bilateral salpingo-oophorectomy, omentectomy, small bowel resection with end-to-end anastomosis, adhesiolysis, abdominal lavage, and delayed primary suture performed in collaboration with the gynecologic oncologists and general surgeon team. The procedure lasted 3 hours and 35 minutes, with an estimated blood loss of 1,000 mL. Intraoperative disseminated intravascular coagulation (DIC) was detected, necessitating blood component transfusion.

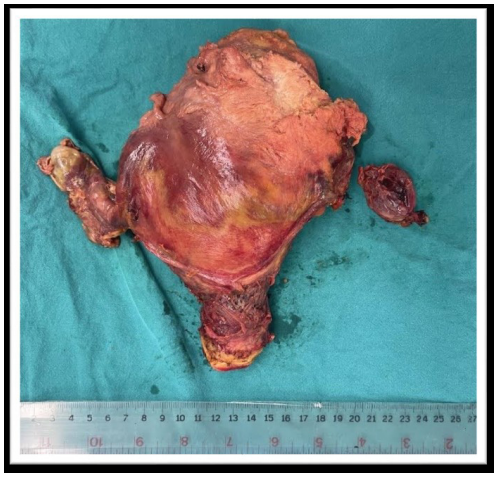

Fig. 2. Gross specimen of the uterus with infected tumor size 7x8 cm at the fundus.

Postoperatively, the patient remained in the intensive care unit for one week to manage sepsis and multi-organ dysfunction. Blood cultures identified Clostridium perfringens. Histopathology reported grade 3 endometrioid carcinoma of the endometrium with metastatic involvement of the omentum and small bowel, free of tumor at surgical margins. She received intensive intravenous meropenem and later switched to piperacillin/tazobactam following consultation with the infectious disease team.

On postoperative day 14, the patient developed wound infection and wound evisceration, necessitating vacuum-assisted closure therapy. These complications prolonged hospitalization and delayed the initiation of adjuvant chemotherapy. The total hospital stay was 79 days. The final diagnosis was endometrial carcinoma, FIGO stage IVB, with omental and small bowel metastases. Once the infection resolved, she received platinum-based chemotherapy, achieving a favorable response. Following the completion of chemotherapy, she was referred for adjuvant radiotherapy.

The patient completed adjuvant chemotherapy and radiotherapy. She regained full functional status without activity restrictions. Follow-up CT imaging of the chest and abdomen confirmed a complete

response, with no evidence of recurrence or distant metastases. As of the latest follow-up, the disease-free interval is eight months.

Case 3

A 63-year-old postmenopausal Thai woman presented to the emergency department with acute abdominal pain, persisting for eight hours. Her medical history included diabetes mellitus and hypertension. She had three previous vaginal deliveries and underwent natural menopause at age 50 without hormonal treatment. She had a known diagnosis of pelvic organ prolapse treated with a pessary and was scheduled for routine follow-up at another hospital. She denied any history of sexually transmitted disease, history of postmenopausal bleeding, or abnormal vaginal discharge.

On physical examination, her vital signs were stable, with a body temperature of 37.6°C, pulse rate of 70 beats/min, and blood pressure of 130/80 mmHg. Abdominal examination revealed generalized tenderness with muscular guarding and rebound tenderness, suggesting peritonitis.

Laboratory investigations demonstrated leukocytosis with a white blood cell count of 18,700/mL (78% neutrophil, 17% lymphocyte), while other parameters were within normal limits. CT with intravenous contrast revealed intra-abdominal free air, leading to a presumptive diagnosis of diffuse peritonitis secondary to a hollow viscus organ perforation. A general surgeon was consulted, and an emergency laparotomy was performed after obtaining informed consent.

The laparotomy revealed 600 mL of pus and ascitic fluid. No abnormalities were detected in the alimentary tract, liver, or gallbladder. A 1 cm perforation with necrosis was identified in the anterior uterine wall. (Fig. 3). Intraoperative consultation with a gynecologist led to a multidisciplinary surgical approach. The general surgery team performed an appendectomy, omental biopsy, and adhesiolysis of bowel loops, and the gynecologic oncologist performed a total hysterectomy with bilateral salpingo-oophorectomy, bilateral pelvic lymph node sampling, and peritoneal lavage. The total estimated blood loss was 700 mL.

Fig. 3. Gross specimen of the uterus with necrosis of myometrium.

Intraoperatively, the patient developed oliguria and hypotension, leading to the diagnosis of septic shock. Inotropic agents were administered, and she was transferred to the intensive care unit (ICU) postoperatively with intubation and ongoing vasopressor support. Intensive broad-spectrum

antibiotics and strict respiratory and circulatory management were maintained for the first three postoperative days.

After clinical improvement, the patient was transferred to the gynecologic department for further care. The initial antibiotic regimen of ceftriaxone and metronidazole was escalated to meropenem postoperatively. After an infectious disease consultation, the regimen was further adjusted to piperacillin/tazobactam for a total antibiotic course of 14 days. However, an extended septic workup was performed due to persistent low-grade fever, leading to an additional seven days of meropenem, resulting in a total antibiotic duration of 21 days.

Pus and blood cultures yielded negative results. Histopathological examination confirmed active and chronic endometritis with diffuse necrosis, transmural myometrial necrosis, and perforation of the myometrium, along with acute peri-appendicitis. No malignancy was identified. The final diagnosis was necrotizing endometritis.

On postoperative day 14, the patient developed acute pulmonary embolism, necessitating prolonged hospitalization for anticoagulant therapy. Upon complete recovery, she was discharged on the postoperative day 21.

At the two-month follow-up, the patient fully recovered. Her pulmonary embolism remained well controlled with oral warfarin. However, she was noted to have grade 1–2 vaginal vault prolapse.

Discussion

The correlation between pyometra and spontaneous uterine perforation emphasizes how crucial it is, making caution when handling gynecologic problems, particularly in elderly females. The preoperative diagnosis was challenged by timely recognition and intervention. Life-threatening complications can result from a delayed or missing diagnosis; as illustrated in case 2 of this study, the patient experienced multiple organ failure and septic shock.

The preoperative diagnosis of uterine perforation in pyometra cases is seldom established due to its nonspecific presentation, often mimicking acute complications of gastrointestinal tract disease. Retrospective studies have reported that preoperative diagnoses in such cases were gastrointestinal tract perforation in 50% of cases and generalized peritonitis in 18.4%, with only 21% having an accurate preoperative diagnosis[8, 9]. Furthermore, classic gynecologic symptoms such as abnormal vaginal bleeding or discharge are frequently absent. Ruptured pyometra has a median onset age of 73.8 years, with a high mortality rate of up to 25-40%[10]. The studies also indicate that 22% of cases are associated with malignancy, 4% with genital tract abnormalities, and 74% are idiopathic[3]. Notably, in most case reports, uterine perforation in gynecologic malignancy is linked to radiotherapy treatment[11].

The high proportion of asymptomatic pyometra cases reported in up to 50% of patients emphasizes the necessity for routine screenings and thorough examinations, especially in elderly females or those with risk factors such as cervical stenosis.

Cervical stenosis was a common underlying risk factor in all three cases presented in this report. The first case involved cervical obstruction due to cervical malignancy, the second case was advanced endometrial carcinoma without vaginal bleeding due to nulliparous cervix, and the third case involved cervical stenosis in a postmenopausal woman using a pessary. Notably, two cases were associated with advanced gynecologic malignancy: endometrial carcinoma and cervical malignancy. As illustrated by cases 1 and 3, it suggests that spontaneous uterine perforation could be a rare but severe manifestation of advanced gynecologic malignancies and complicated treatment.

The high mortality rate of uterine rupture highlights the urgency for prompt surgical intervention. The cornerstones of management are hysterectomy, bilateral salpingo-oophorectomy, abdominal lavage, and broad-spectrum antibiotics[12, 13]. The decision to perform surgical staging in cases suspicious of malignancy must be carefully weighed in the context

of the emergency setting, patient condition, stage of malignancy, and the surgeon's experience.

This report is valuable because it is a resource for healthcare professionals on the rare conditions of spontaneous uterine perforation with different benign and malignancy conditions. It offers detailed management and treatment protocols for better patient outcomes.

Conclusion

Spontaneous uterine perforation is a life-threatening gynecologic condition. It is essential to differentiate this condition from gastrointestinal tract perforation in women with clinical abdominal peritonitis. Identifying key risk factors, particularly cervical stenosis, and utilizing preoperative imaging are crucial for accurate diagnosis.

A comprehensive approach involving a multidisciplinary team, emergency laparotomy with peritoneal drainage, and broad-spectrum antibiotics therapy are essential for optimizing patient outcomes. Early recognition and prompt surgical intervention remain the mainstay of management in preventing fatal complications.

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Potential conflicts of interest

The author declares no conflicts of interest.

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