

## ORIGINAL RESEARCH

### Spontaneous perforation of uterus presenting with pneumoperitoneum

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#### ABSTRACT

**Background:** Spontaneous rupture of gangrenous uterus with generalized peritonitis in postmenopausal women is a very rare entity usually caused by pyometra and is associated with high morbidity and mortality. The clinical findings of perforated pyometra are similar to perforation of the gastrointestinal tract which makes preoperative diagnosis difficult. A correct and definite diagnosis can be made with laparotomy or laparoscopy. We report a case of a 55-year-old lady who presented with generalized peritonitis with pneumoperitoneum. This report aims to alert surgeons to the possibility that perforation of uterus due to gangrene with anaerobic infection also shows air under diaphragm apart from hollow viscus perforation.

**Key words:** Gangrenous uterus, perforated uterus, pyometra, pneumoperitoneum.

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#### INTRODUCTION

Gangrenous uterus with perforation is an uncommon condition due to the rich vascular supply of uterus. Uterine perforation causes severe morbidity and mortality, prompt management can improve outcome. Uterine perforation is usually seen at the fundus (77%), but may occur anteriorly (4%).[1]

Pyometra is defined as the accumulation of purulent material in the uterine cavity resulting from interference of its natural drainage.[2,3] It is an uncommon condition with a reported incidence ranging from 0.1% to 0.5% and an incidence approaching 13.6% in postmenopausal women.[2,3,4] It is associated with benign or malignant gynecological tumors, colorectal tumors, radiation cervicitis, congenital anomalies, puerperal infections and intrauterine devices.[2,5]

Pyometra with accompanying necrosis of the uterine wall can lead to spontaneous uterine perforation with diffuse peritonitis, a rare complication with a reported incidence of 0.01–0.05%. [2]

Pneumoperitoneum is seen in hollow viscus perforation, penetrating trauma, after laparotomy and laparoscopy. However, pneumoperitoneum in a case of uterine perforation is a very rare presentation.[2,3]

We report a case of 55-year-old lady with pyometra resulting in gangrenous uterus and perforation presenting with pneumoperitoneum.

### CASE DETAILS

55-year post-menopausal multiparous women presented with leucorrhoea since 10 days. Abdominal pain, Constipation and low-grade fever since 3 days.

Abdominal pain was sudden in onset, generalized more in lower abdomen, increasing in intensity associated with 2 episodes of non-bilious vomiting.

History of tubectomy 20 years back, attained Menopause 8 years back.

Previous menstrual history was normal. No history of previous IUD and vaginal pessaries. She had not undergone endometrial biopsy or dilatation curettage operations before.

The above history was narrated by the patient herself and her daughter.

### CLINICAL EXAMINATION

Patient presented in grade 3 hypovolemic shock but was responding to commands, was able to give history. Patient was resuscitated with IV fluids and investigated further for the cause of hypovolemic shock. Per abdomen examination revealed generalized guarding and rigidity suggestive of peritonitis. Per rectal and per vaginal examination failed to reveal any abnormality or reason for leucorrhoea.

### INVESTIGATIONS

X-ray erect abdomen revealed pneumoperitoneum.[fig-1]

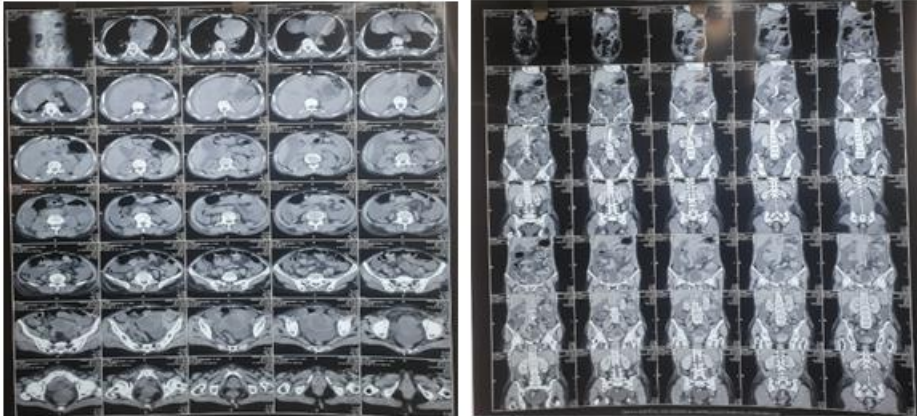


**Figure 1: Xray erect abdomen showing air under right dome of diaphragm suggestive of pneumoperitoneum.**

Ultrasound abdomen was suggestive of free fluid with multiple internal echoes noted in peritoneum.

Uterus was measuring 8.3\*5.6\*7.4cms with thickened myometrium and evidence of collection in the endometrial cavity with internal echoes, debris and air foci.

Cect abdomen was reported as hollow viscus perforation likely due to peptic ulcer. [Fig-2]



**Figure 2: Axial and coronal pictures of cect abdomen showing free fluid in peri-hepatic, peri-splenic and pelvic region.**

Patient was taken up for laparotomy with a preop diagnosis of hollow viscus perforation after correction of hypovolemia.

- Intra-op findings:
1. Gangrenous uterus with perforation measuring 2\*1 cm at fundus and gangrenous segment 6\*7 cms involving fundus and left side of uterus.[fig-3]
  2. 1.2 litres of foul-smelling pus in peritoneal cavity.
  3. Omental vascular thrombosis seen
  4. No bowel perforation found
  5. No intra uterine foreign bodies found.



**Figure 3: Intra-op pictures showing perforation over the fundus of uterus with gangrenous changes.**

**SURGICAL PROCEDURE:** Under general endo-tracheal anesthesia, Exploratory laparotomy was done with drainage of peritoneal collection and then total abdominal hysterectomy with bilateral salpingo-oophorectomy was performed, thorough wash given with normal saline and closure was done after placing bilateral flank drains.

Intra-op and immediate post op period was uneventful.

Post op period: Patient went into multi organ dysfunction, couldn't recover from septic shock and unfortunately died on the 1<sup>st</sup> post operative day.

Histopathological examination reveals hyperplasia of endocervical glands, squamous metaplasia of endocervical lining. Stroma has lymphomononuclear infiltration. Sections of uterus revealed focally preserved myometrial fibres. Features were consistent with ischemic necrosis (gangrene) uterus, ovaries and tubes.

## DISCUSSION

Pneumoperitoneum is a diagnostic finding of hollow viscus perforation. It is also seen in penetrating abdominal trauma, after laparotomy and laparoscopy. However, uterine perforation presenting with pneumoperitoneum is extremely rare. Pyometra, although rare in the general population, is found more frequently in postmenopausal women as a result of occlusion of the cervical canal by malignant or benign tumors, surgery, radiotherapy, and senile cervicitis.[6][7] The classical triad of symptoms includes postmenopausal vaginal bleeding, purulent vaginal discharge, and suprapubic pain.[6][8] However, more than 50% of all cases are asymptomatic.[6][9][10]

Although atrophic endometrium is a common cause, perforation is usually seen in the presence of serious causes such as cervical or endometrial carcinoma or a forgotten intrauterine device. Malignant disease is present in 35% of cases. [6]

In our patient there was no evidence of malignancy during surgery, she had no intrauterine device, and had not undergone endometrial biopsy or dilatation curettage operations before. Therefore, the most probable cause of pyometra was postmenopausal changes and stenosis of the cervix causing stagnation of discharge resulting in anaerobic infection causing perforation at fundus.

The microbiological flora of the lower female genital tract provides a dynamic, complex example of microbial colonization, the regulation of which is not fully understood.[11] Anaerobic bacteria constitutes a substantial component of the normal vaginal flora and of the outer cervical canal.[12] The vaginal mucosa as a caretaker protects the lower genital tract from harmful pathogens including HIV[13]

The vaginal flora is composed predominantly of aerobic and anaerobic lactobacilli, coryneform, staphylococcus epidermidis, group B streptococci, candida albicans, bacteroides spp., bifidobacterial, and anaerobic Gram-positive cocci.[14,15] These can cause changes in discharge if they are not controlled and become overgrown.[15] Infectious causes of abnormal discharge usually include sexually transmitted infections including *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Trichomonas vaginalis*, *Ureaplasma*, and less commonly HSV-2 and endogenous infections (i.e. dysbiotic out- growths of common commensal bacterial such as in AV and BV).[15]

A healthy vaginal microbiota is considered to be significant for maintaining vaginal health and preventing infections. However, certain vaginal bacterial commensal species serve an important first line of defense of the body. Furthermore, these microbes maintain a low vaginal pH, prevent the acquisition of pathogens, stimulate or moderate the local innate immune system, and further protect against complications during pregnancies.[15]

Vaginal infections may contribute to the progression of cervical dysplasia, increased risk of post-delivery infections, HIV, and herpes simplex virus-2 (HSV-2) acquisition and transmission.[15] Several bacterial species colonize the reproductive tracts of women, in addition, the rectum has been suggested to provide an essential source of organisms that commonly colonize the vagina.[15,16] This is of significance since bacteria are repeatedly shed from the body in vaginal secretions, and bacterial regrowth must happen to replenish their number.[15,17]

Continued research on acute pelvic inflammatory disease (PID) has demonstrated that PID has a rather remarkably varied etiology, the pathogens responsible including *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, aerobic and anaerobic gram-positive and gram-negative organisms, and possibly mycoplasmas.[18]

*Clostridium perfringens* is a Gram-positive, obligate anaerobe that is the most common cause of gas gangrene. *Clostridium perfringens* is part of the normal vaginal flora in 1% to 10% of healthy women. It is thought most uterine *Clostridium perfringens* infections are secondary to ascension of bacteria from the vagina or from the transfer of bacteria with uterine

instrumentation.[19] *Clostridium perfringens* colonize damaged tissues that have a compromised vascular supply leading to low oxygen tension. In this hypoxic environment, anaerobic bacteria proliferate and by doing so, release exotoxins. If left untreated, the effects of these exotoxins can be fatal. The mortality rate of gas gangrene with sepsis is reportedly as high as 30%.[19] The cornerstones of treatment remain early recognition and aggressive treatment with broad-spectrum antibiotics and surgical debridement. [19,20]

## CONCLUSION

Surgeon or treating physician has to be cautious before labelling pneumoperitoneum as only due to hollow viscus perforation in a patient with peritonitis. Proper detailed history goes a long way in helping diagnose the condition even with the availability of modern diagnostic radiological investigations which may mislead the clinician as evident in our case. Early recognition of the condition holds the key even more so in anaerobic bacterial infection where early surgical debridement is of immense value as compared to antibiotic therapy.

## REFERENCES

1. Harika, Doni Navya Sessa & Rao, T. & Sireesha, P. & Jithendra, D. & Pandu, Satya. (2019). A rare case of gas under diaphragm due to spontaneous perforation of uterus due to gas gangrene of uterus with clostridium perfringens infection presenting as intestinal perforation. *International Surgery Journal*. 6. 3009. 10.18203/2349-2902.isj20193362.
2. Ikennah L Browne, Spontaneous perforation of pyometra—is hysterectomy required in the emergent setting? A case report and literature review, *Journal of Surgical Case Reports*, Volume 2022, Issue 8, August 2022, rjac388, <https://doi.org/10.1093/jscr/rjac388>
3. Yildizhan B, Uyar E, Si, smanoglu A, Güllüo ~ glu G, Kavak ZN. ~ Spontaneous perforation of pyometra. *Infect Dis Obstet Gynecol* 2006;2006:26786.
4. Emergui Zrihen Y, Obreros Zegarra LP, García Hernández JA. Spontaneous uterine rupture due to pyometra, a case report. *Eur J Obstet Gynecol Reprod Biol* 2017;217:182–3
5. Ou YC, Lan KC, Lin H, Tsai CC, ChangChien CC. Clinical characteristics of perforated pyometra and impending perforation: specific issues in gynecological emergency. *J Obstet Gynaecol Res* 2010;36:661–6
6. İşlek Seçen E, Ağış H, Altunkaya C, Avşar AF. Postmenopausal spontaneous uterine perforation: Case report. *Turkish Journal of Obstetrics and Gynecology*. 2015 Jun;12(2):122-124. DOI: 10.4274/tjod.70370. PMID: 28913055; PMCID: PMC5558376.
7. Li CH, Chang WC. Spontaneous perforated Pyometra with an intrauterine device in menopause: a case report. *Jpn J Infect Dis*. 2008;61:477–8.
8. Hansen PT, Lindholt J. Spontaneously perforated pyometra. A differential diagnosis in acute abdomen. *Ann Chir Gynaecol*. 1985;74:294–5.
9. Nuamah NM, Hamaloglu E, Konan A. Spontaneous uterine perforation due to pyometra Presenting as acute abdomen. *Int J Gynecol Obstet*. 2006;92:145.
10. Kitai T, Okuno K, Ugaki H, Komoto Y, Fujimi S, Takemura M. Spontaneous uterine perforation of pyometra presenting as acute abdomen. *Case Rep Obstet Gynecol*. 2014;2014:738568.
11. Bryan Larsen, Gilles R. G. Monif, Understanding the Bacterial Flora of the Female Genital Tract, *Clinical Infectious Diseases*, Volume 32, Issue 4, 15 February 2001, Pages e69–e77, <https://doi.org/10.1086/318710>
12. Bergan T. Anaerobic bacteria as cause of infections in female genital organs. *Scand J Gastroenterol Suppl*. 1983;85:37-47. PMID: 6353553.

13. Kalia, N., Singh, J. & Kaur, M. Microbiota in vaginal health and pathogenesis of recurrent vulvovaginal infections: a critical review. *Ann Clin Microbiol Antimicrob* 19, 5 (2020). <https://doi.org/10.1186/s12941-020-0347-4>
14. Wilks, M., Tabaqchali, S. (1987). The Anaerobic Bacterial Flora of the Vagina in Health and Disease. In: Borriello, S.P., Hardie, J.M., Drasar, B.S., Duerden, B.I., Hudson, M.J., Lysons, R.J. (eds) *Recent Advances in Anaerobic Bacteriology. New Perspectives in Clinical Microbiology*, vol 12. Springer, Dordrecht. [https://doi.org/10.1007/978-94-009-3293-7\\_17](https://doi.org/10.1007/978-94-009-3293-7_17)
15. Kaambo E, Africa C, Chambuso R and Passmore J-AS (2018) Vaginal Microbiomes Associated With Aerobic Vaginitis and Bacterial Vaginosis. *Front. Public Health* 6:78. doi: 10.3389/fpubh.2018.00078
16. El Aila NA, Tency I, Claeys G, Saerens B, De Backer E, Temmerman M, et al. Genotyping of *Streptococcus agalactiae* (group B streptococci) isolated from vaginal and rectal swabs of women at 35–37 weeks of pregnancy. *BMC Infect Dis* (2009) 9(1):153. doi:10.1186/1471-2334-9-153
17. Ma B, Forney LJ, Ravel J. Vaginal microbiome: rethinking health and disease. *Annu Rev Microbiol* (2012) 66:371–89. doi:10.1146/annurev-micro-092611-150157
18. Dodson MG, Faro S. The polymicrobial etiology of acute pelvic inflammatory disease and treatment regimens. *Rev Infect Dis.* 1985 Nov-Dec;7 Suppl 4:S696-702. doi:10.1093/clinids/7. supplement4.s696. PMID: 3909326.
19. Kremer KM, McDonald ME, Goodheart MJ. Uterine *Clostridium perfringens* infection related to gynecologic malignancy. *Gynecol Oncol Rep.* 2017 Sep 21;22:55-57. doi: 10.1016/j.gore.2017.09.006. PMID: 29034307; PMCID: PMC5635240.
20. Halpin T.F., Molinari J.A. Diagnosis and management of clostridium perfringens sepsis and uterine gas gangrene. *Obstet. Gynecol. Surv.* 2002 Jan;57(1):53–57. [PubMed] [Google Scholar]