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CASE REPORT

Unusual case of intra-abdominal candidiasis following laparoscopic hysterectomy

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SUMMARY

A 41-year-old woman with menorrhagia secondary to adenomyosis underwent an elective uncomplicated total laparoscopic hysterectomy after failed medical therapy. She developed fever, epigastric pain, nausea and diarrhoea on postoperative day (POD) 2. CT of abdomen and pelvis performed on POD 3 revealed an 8×3×3 cm fluid collection superior to the bladder. She did not respond to conservative treatment with intravenous antibiotics and therefore underwent an ultrasound-guided drainage on POD 7. The green-debris-laden fluid that was drained grew *Candida*. Investigations to screen for an immunocompromised state were negative. Her symptoms resolved after commencement of fluconazole and she was discharged home on POD 12. Repeat scans in 4 weeks' time showed a marked reduction in collection. In a well patient, the presence of green intra-abdominal fluid should raise a suspicion for intra-abdominal candidiasis after ruling out bowel injury.

BACKGROUND

Candida is a normal commensal of the gastrointestinal, oral and vaginal tracts. Risk factors for intra-abdominal candidiasis (IAC) include peritoneal dialysis, surgical/traumatic injury to bowel and immunocompromised state. It is difficult to estimate the incidence of post-surgical IAC; however, it has been reported that just over half of the fungal peritonitis is due to *Candida* species.^{1–3}

We present an unusual case of IAC following total laparoscopic hysterectomy (TLH) in a healthy, low-risk woman with no previous medical history. There are no other similar published cases of a young healthy woman who was undergone an uncomplicated routine hysterectomy and developed IAC.

CASE PRESENTATION

This was a 41-year-old woman who was being followed up in the outpatient clinic for menorrhagia.

She had no significant medical, surgical, social or family history of note. Her obstetric history includes a missed miscarriage at 17 weeks of gestational age, two normal vaginal deliveries, a spontaneous first trimester miscarriage and two first trimester termination of pregnancies. She was noted to have a drug allergy to amoxicillin.

She presented to the outpatient clinic for menorrhagia and dysmenorrhea in 2009. She was initially managed with conservative medical treatment

including tranexamic acid, mefenamic acid and iron supplements. Regular ultrasound pelvis done every 6 months revealed normal endometrial thickness with normal ovaries, and a stable adenomyoma (4.5 cm). She was on regular follow-up in the clinic, but her symptom of heavy menstrual flow worsened since 2014, resulting in her requiring multiple hospital admissions for blood transfusions and intravenous iron infusion. The levonorgestrel-releasing intra uterine device (IUD) (Mirena) inserted on three occasions were expelled soon after insertion and a trial of norethisterone was not suitable as she developed palpitations after commencing on the oral hormonal therapy. She was offered definite surgical treatment with a total hysterectomy bilateral salpingectomy, but only decided to proceed with the operation on 20 April 2016.

The documented intraoperative findings at the total laparoscopic hysterectomy bilateral salpingectomy (TLHBS) were consistent with the ultrasound and physical examination findings of an adenomyotic, 12-week size uterus with normal tubes and ovaries (figure 1). A routine TLHBS was done and the specimen was retrieved vaginally with an estimated blood loss of 200 mL (figure 2).

It must be noted that the TLHBS was completed uneventfully; however, the retrieval of the specimen was difficult due to the bulky and globular uterus. The adenomyotic uterus was 'cored' with tissue scissors to reduce the size to enable the specimen to be removed vaginally. During the process of 'coring', the uterus was manipulated forward and backward into the abdominal cavity and vagina. The histology was reported that there was mild chronic endocervicitis in the cervix but otherwise benign findings (leiomyoma and adenomyosis) in the specimen (uterus, cervix and tubes).

She was recovering well, ambulating independently and was on soft diet on post operative day (POD) 1. On POD 2, she developed fever, epigastric discomfort, nausea and diarrhoea. A CT of abdomen and pelvis performed on POD 3 revealed an 8×3×3 cm fluid collection superior to the bladder (figure 3). Her symptoms were not improving despite escalating the antibiotic regimen from intravenous clindamycin to meropenem on POD 5. Her symptoms worsened and she progressively became unwell with high-grade temperatures, abdominal bloating, epigastric pain, vomiting and watery green stools. An intra-abdominal drain was inserted under ultrasound guidance to drain the fluid collection superior to the bladder on POD 7. The green-debris-laden fluid drained was similar

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Figure 1 Specimen.

in colour and consistency with the watery green stools that the patient was experiencing at the same time (figures 4 and 5). The fluid that was drained grew *Candida* on cultures.

Investigations to screen for an immunocompromised state and bowel injury were negative. Her symptoms resolved after completing 3 days of intravenous fluconazole and her drain was removed on POD 10. She was discharged home on POD 12 with oral antibiotics (ciprofloxacin and metronidazole) and fluconazole to complete for 2 weeks. Repeat scans in 4 weeks showed a marked reduction in collection (figure 6).

INVESTIGATIONS

CT abdomen and pelvis revealing the collection (predrainage) (figure 3).

CT abdomen and pelvis image at 4-week follow-up (figure 6).

HIV screen—non-reactive.

Diabetes mellitus (DM) screen—haemoglobin A1c (HbA1c) 4.9%.

Blood and urine culture—no bacterial growth.

Stool culture—no *Salmonella*, *Shigella*, *Campylobacter* or *Vibrio* species isolated; no *Clostridium difficile* isolated.

Stool microscopy—no ova, cysts, trophozoites or parasites seen.

Fluid culture—*Candida albicans* (moderate growth).

Gram stain smear—blastoconidia with pseudohyphae seen.

Figure 2 Dry vaginal vault at closure.

Figure 3 CT scan image of collection predrainage.

DIFFERENTIAL DIAGNOSIS

In this woman who had undergone abdominal surgery presenting with fever, abdominal distension, nausea, vomiting and diarrhoea, the first-line investigation we did was a computed Tomography of abdomen and pelvis (CTAP) to rule out the following differential diagnoses:

1. Bowel obstruction.
2. Paralytic ileus.
3. Bowel injury.
4. Gallbladder rupture/injury.

TREATMENT

As discussed in the Case presentation section.

OUTCOME AND FOLLOW-UP

On confirmation of IAC, intravenous fluconazole was commenced and the woman had very good response and there

Figure 4 Green-debris-laden fluid in abdominal drain.

Figure 5 Green-debris-laden fluid in abdominal drain.

was marked improvement in her clinical state after just 3 days of the treatment. Her symptoms resolved on POD 10 and the drain was removed. She was discharged home on POD 12 and remained asymptomatic at the 4-week follow-up. A repeat CT abdomen and pelvis done in the outpatient clinic showed a marked reduction in collection (figure 6).

DISCUSSION

This is an unusual case of IAC following TLH in a healthy, low-risk woman with no previous medical history.

It is difficult to estimate the incidence of postsurgical IAC; however, a large multicentre study in 101 French intensive care units (ICU), reported an approximate ratio of one patient with hospital-acquired (almost all postoperative) *Candida* peritonitis for every two patients with candidaemia, in ICU.¹ The most common cause of fungal peritonitis is *Candida*, predominately *C. albicans*, which is found in ~55% of cases of IAC.¹⁻³ IAC is the most common type of deep-seated candidiasis, but remains poorly understood compared with candidemia.² There are no

other similar published cases of a young healthy woman who had undergone an uncomplicated routine hysterectomy and developed IAC.

IAC is more common in patients on multiple antibiotics, diabetes mellitus, patients on peritoneal dialysis and an immunocompromised state, but extremely rare in healthy adults.^{1,4} The incidence of fungal peritonitis in patients receiving peritoneal dialysis ranges from 3% to 6%.³ The woman did not have any of the above stated risk factors, and an initial screen for an immunocompromised state was negative.

One of the causes of IAC include peritoneal contamination from injury of the gastrointestinal tract, of which small bowel injury is the most common.¹⁵ However, this was excluded in this woman on a CTAP done on POD 3.

Cases of *Candida* peritonitis post caesarean section and *Candida* chorioamnionitis due to ascending infection from the vagina have been reported in the literature.^{4,6,7} A vaginal swab performed on POD 8 in our woman, in view of a positive fluid culture for *Candida*, was negative. However, a review of past investigations showed recurrent inflammatory smears and vaginal candidiasis on papanicolaou test (PAP) smears and lower genital swabs, respectively, despite adequate treatment. Considering the fact that this was not a culture but a DNA probe test for *Candida* which has a sensitivity of 80% and specificity 98%,⁸ this woman's IAC could still be attributed to the ascending infection from the vagina.

Symptoms such as fever, chills, abdominal discomfort and investigations including raised inflammatory markers and white cell count are often milder in IAC than bacterial peritonitis.^{1,2} In this woman, her white cell count ($5.15-8.7 \times 10^9/L$; normal range 4.50–11.00) was not elevated throughout the ordeal. The C reactive protein was elevated but remained stable (244.9–365.5 mg/L; normal range 0.0–5.0 mg/L), which could be attributed to her recovery from recent surgery.

A diagnosis is made by observing yeast microscopically or having a positive culture for *Candida* from the peritoneal fluid aspirated under image guidance or intraoperatively.¹ In this woman, blastoconidia with pseudohyphae seen on the Gram stain smear of the green fluid drained from the collection, and the presence of *C. albicans* from the fluid culture confirmed the diagnosis.

All patients should undergo source control interventions and receive antifungal treatment promptly.² An early diagnosis with initiation of antifungal therapy and a carefully coordinated multi-disciplinary team management have shown to improve survival in these patients.² Treatment of IAC entails both drainage (surgically or percutaneously) and antifungal therapy (with

Figure 6 CT scan image at 4-week follow-up.

Learning points

- ▶ Avoid movement of specimen from the vagina to the abdominal cavity to minimise ascending infection during transvaginal retrieval of specimen.
- ▶ Presence of green intra-abdominal fluid postoperatively in an otherwise well patient must raise a high clinical suspicion for intra-abdominal candidiasis (IAC) after ruling out gastrointestinal tract injuries.
- ▶ IAC can occur in a patient who is not immunocompromised.
- ▶ Preoperatively, if there is a history of recurrent vaginal infections or evidence of vaginal discharge, a screening test should be done to exclude lower genital tract infection prior to surgery.

echinocandin or fluconazole for minimum 2 weeks) until the abscess and all signs and symptoms of peritonitis are resolved. This will avoid complications such as bloodstream invasion with sepsis and abscess formation.^{1 9} There is evidence that percutaneous catheter drainage is more effective in eradicating an abscess, with a clinical improvement seen within 24–72 hours.¹⁰ Vergidis *et al* estimated the overall mortality ranged from 13% to 88%,² and a recent French study also concluded that the overall mortality is ~40%.¹

Despite unexpected IAC, a prompt diagnosis with early involvement of a multidisciplinary team management involving the infectious disease team, microbiologist and the interventional radiologist was crucial in the effective management of this healthy woman who had undergone an uncomplicated routine hysterectomy. This led to an uneventful recovery in her.

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REFERENCES

- 1 Peritonitis C. Leading International Fungal Education. <http://www.life-worldwide.org/fungal-diseases/candida-peritonitis/>
- 2 Vergidis P, Clancy CJ, Shields RK, *et al*. Intra-Abdominal Candidiasis: The Importance of Early Source Control and Antifungal Treatment. *PLoS One* 2016;11:e0153247.
- 3 Chen KH, Chang CT, Yu CC, *et al*. Candida parapsilosis peritonitis has more complications than other Candida peritonitis in peritoneal dialysis patients. *Ren Fail* 2006;28:241–6.
- 4 Rottenstreich M, Khatib F, Rotem R, *et al*. Post cesarean candida peritonitis. *Eur J Obstet Gynecol Reprod Biol* 2018;229:203–8.
- 5 Epstein MG, Silva DL, Elias NC, *et al*. Isolated rupture of the gallbladder following blunt abdominal trauma: case report. *Einstein* 2013;11:227–8.
- 6 Hasibeder W, Halabi M. Candida peritonitis. *Minerva Anesthesiol* 2014;80:470–81.
- 7 Garcia-Flores J, Cruceyra M, Cañameres M, *et al*. Candida chorioamnionitis: Report of two cases and review of literature. *J Obstet Gynaecol* 2016;36:843–4.
- 8 Vaginitis D. Clinical policy bulletins/medical clinical policy bulletins number 0643. (Last review 09/18/2018).
- 9 Solomkin JS, Mazuski JE, Bradley JS, *et al*. Diagnosis and management of complicated intra-abdominal infection in adults and children: guidelines by the Surgical Infection Society and the Infectious Diseases Society of America. *Clin Infect Dis* 2010;50:133–64.
- 10 Schein M. Management of intra-abdominal abscesses. In: Holzheimer RG, Mannick JA, eds. *Surgical Treatment: Evidence-Based and Problem-Oriented*. Munich: Zuckschwerdt, 2001.

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