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CASE REPORT

Ileo-Uterine Fistula Following Endometrial Aspiration with Imaging Investigations and Hysteroscopic Correlation: A Case Report

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INTRODUCTION

Ileo-uterine fistula is a very rare condition sporadically reported in the literature. Its occurrence following endometrial sampling, which is a relatively minimally invasive procedure, has not been reported. We present a case of ileo-uterine fistula following endometrial aspiration and describe its imaging features with hysteroscopic correlation.

CASE REPORT

A 73-year-old female presented with a 2-week history of post-menopausal brownish vaginal spotting. Physical examination was unremarkable except for an atrophic cervix. Transabdominal and transvaginal ultrasound revealed a small, retroverted uterus. Endometrial sampling with Pipelle identified chronic endometritis and pyometra. Ultrasound examination was repeated because of persistent foul-smelling vaginal discharge. There was echogenic fluid with gaseous bubbles causing ring-down artefacts within the endometrial cavity. It was drained by endometrial sampling and found to be pus (Figure 1).

Histology of the endometrial biopsy revealed neutrophilic infiltrate, bacterial clumps, food particles, intestinal epithelial fragments, and villi. There was no evidence of malignancy. Diagnosis of pyometra was made and perforation of uterus and/or intestinal-uterine fistula were suspected.

Urgent contrast-enhanced computed tomography (CT) of the pelvis revealed an atrophic uterus. Some normal-looking small bowel loops abutted the uterus. A tiny gas locule was noted within the endometrial cavity on pre-contrast study (Figure 2a) but was absent on post-contrast study (Figure 2b). No definite enterouterine fistula was found. There was no intra-abdominal collection, active contrast extravasation or pneumoperitoneum.

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Ethics Approval: The patient was treated in accordance with the Declaration of Helsinki and has provided informed consent for all procedures.

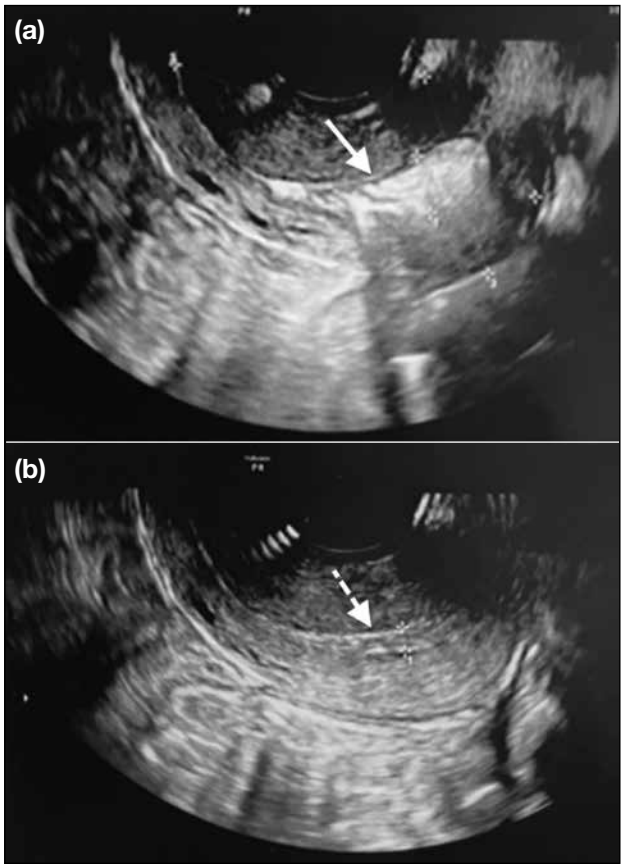

Figure 1. Pre-endometrial sampling (a) and post-endometrial sampling (b) transvaginal ultrasound. Echogenic fluid with ring-down artefacts probably due to presence of gas within the endometrial cavity (arrow in [a]) were almost completely drained (dashed arrow in [b]). The endometrium was not thickened (3.1 mm).

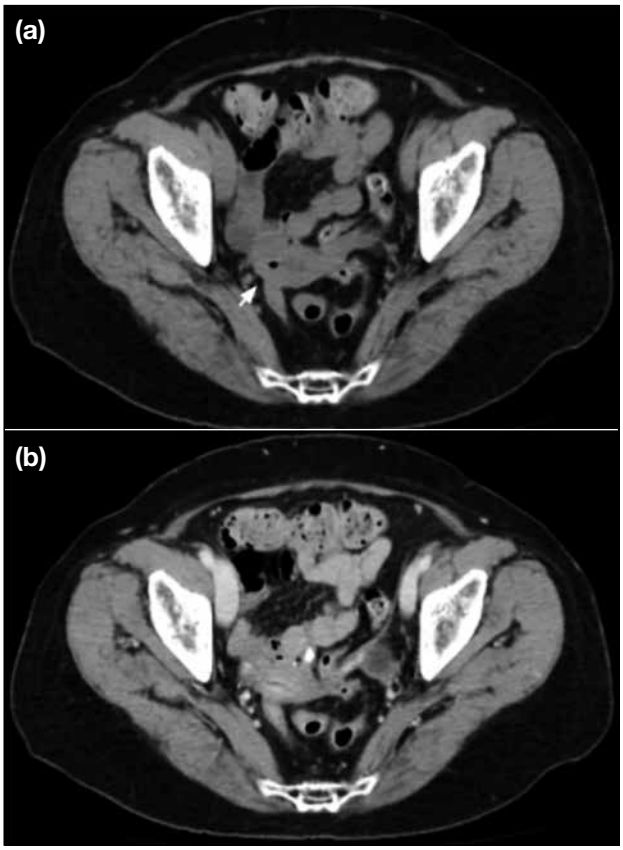

Figure 2. Pre-contrast (a) and post-contrast (b) axial computed tomography of the pelvis. A gas locule was seen within the endometrial cavity (arrow in [a]) in plain study but disappeared in post-contrast study. No abnormal collections could be seen.

Diagnostic hysteroscopy revealed irregular and oedematous endometrium with a 5-mm fistula opening at the uterine fundus (Figure 3a). The hysteroscope was able to pass through the fistula tract and enter the bowel with bowel wall peristalsis and some yellowish bowel content seen (Figure 3b). This confirmed the diagnosis of enterouterine fistula, likely connecting the uterus and the small bowel.

A small bowel follow-through was then arranged. The preliminary film showed no gross pneumoperitoneum (Figure 4a). Gastrografin reached the small bowel at the lower abdomen on spot images taken 1 hour after per-oral administration of gastrografin. The genital tract was likely obscured by the opacified small bowel on both frontal and lateral views (Figure 4b and c). The patient complained of clear vaginal discharge 15 minutes after the spot images, raising the clinical suspicion of contrast material entering the genital tract via the fistula.

A supplementary plain CT of the pelvis identified a contrast-opacified fistula tract between the terminal ileum and the uterine fundus (Figure 5a).

Magnetic resonance imaging (MRI) of the pelvis with axial, sagittal, and coronal pre- and post-contrast sequences including T1-weighted turbo spin echo and T2-weighted true fast imaging with steady-state free precession (trueFISP) imaging were performed. The ileo-uterine fistula tract was not seen in most of the sequences, except in the coronal T2-weighted trueFISP image. The uterine fundus was adherent to the adjacent ileum with loss of normal Indian ink artefact. The open fistula tract contained T2-weighted hyperintense fluid and a curvilinear hypointense signal, possibly due to flow void. Roundish signal voids in the endometrial cavity could be due to the gas locule inside the cavity (Figure 5b). There were no contrast-enhanced septic foci detected.

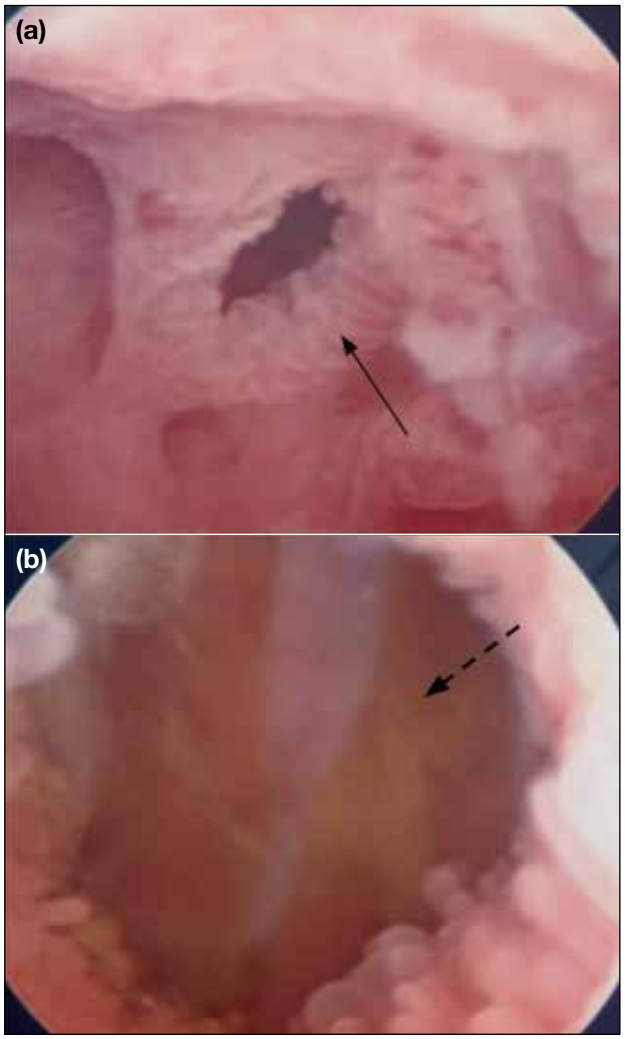

Figure 3. Snapshots of hysteroscopic examination. (a) Fistula opening was noted at the fundus of the endometrial cavity (arrow). (b) The fistula tract was connected to the bowel that demonstrated wall peristalsis and some yellowish bowel content when the hysteroscope was further advanced through the fistula (dashed arrow).

Total abdominal hysterectomy, bilateral salpingo-oophorectomy, and a partial small bowel resection of 5 cm of the distal ileum containing the fistula with end-to-end anastomosis were performed. The surgical specimen again clearly demonstrated the ileo-uterine fistula connecting the ileum and the uterine fundus (Figure 5c).

Microscopic examination of the surgical specimen showed herniation of small bowel mucosa into the myometrium at the fistula opening and evidence of endometritis. No endometrial hyperplasia or malignancy was evident. The patient made an uneventful post-operative recovery.

DISCUSSION

Ileo-uterine fistula usually presents with non-specific symptoms such as abdominal pain and vaginal discharge.[1-4] Endometrial biopsy yielding abnormal bowel tissue and food particles raises a suspicion of enterouterine fistula.[5] Transvaginal ultrasonography may reveal an intrauterine collection but rarely a fistula tract. Diagnostic hysteroscopy can directly visualise a uterine fistula opening.

Small enterouterine fistulas can be managed conservatively by antibiotics and endometrial aspiration but persistent symptoms warrant definitive surgery.[1,3] Further imaging investigations are important for pre-operative planning.[1,3,6]

CT enables rapid assessment to exclude pneumoperitoneum and gross pelvic abscess. It can detect gas within the endometrial cavity, an indication of enterouterine fistula.[7,8] In this case, the gas within the endometrial cavity was seen only transiently on pre-contrast study. We hypothesise that this was due to movement of gas to and from the fistula tract by bowel peristalsis. This is supported by the bowel peristalsis seen on hysteroscopy and the jet of flow void in coronal T2-weighted trueFISP images. Gas due to recent instrumentation would be expected to be consistently seen in both pre- and post-contrast studies.

Fluoroscopy is the traditional imaging modality for evaluating a pelvic fistula.[1,2,6,9] Opacification of an ileo-uterine fistula tract can be achieved by small bowel follow-through or hysterosalpingogram.[4] Hysterosalpingogram has a higher chance of fistula opacification due to direct manual injection of contrast into the uterine cavity but is more invasive than small bowel follow-through. Contrast opacification of the fistula tract in small bowel follow-through suggests that bowel peristalsis alone builds up sufficient pressure to open the fistula. This may predict a likely need for surgical management due to a low chance of spontaneous fistula closure. A complementary CT of the pelvis right after fluoroscopy can better delineate the three-dimensional anatomy of the contrast-opacified fistula tract.[9]

MRI has the highest soft tissue contrast to delineate a fistula tract. Rapid MRI sequences are essential to minimise image degradation by bowel peristalsis.[6,9] We recommend T2-weighted trueFISP sequence to look for hyperintense fluid and hypointense gas content within the fistula. In addition, we propose that loss of

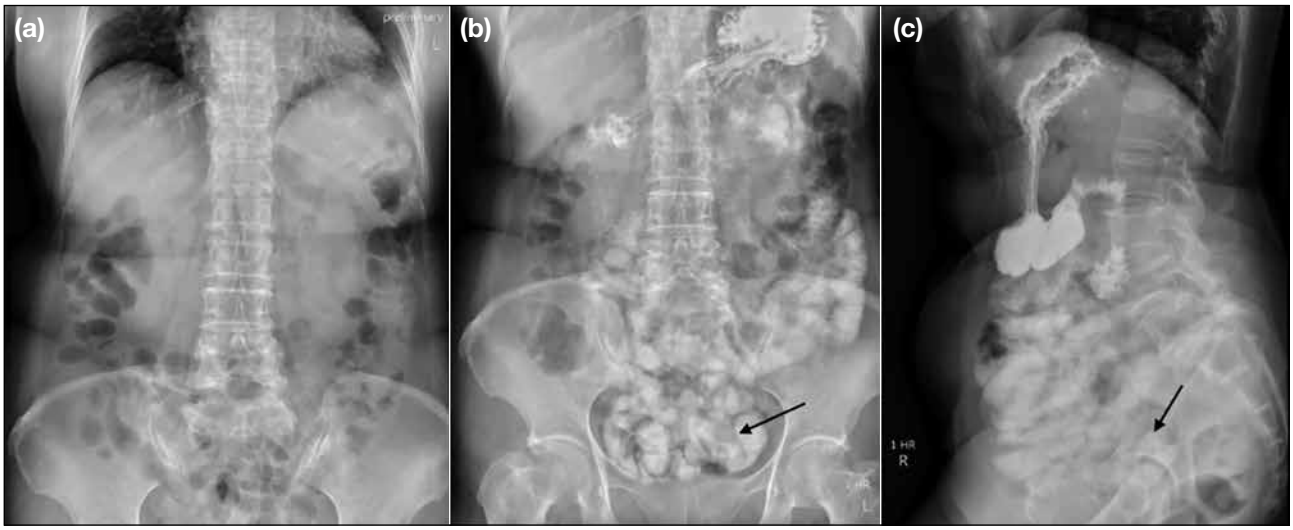

Figure 4. Small bowel follow-through. (a) Preliminary film shows no evidence of gross pneumoperitoneum. Frontal (b) and lateral (c) view 1 hour after per-oral administration of 60-mL gastrografin. Gastrografin has reached the small bowel loops down to the lower abdominal region (arrows). The genital tract was likely obscured by the opacified small bowel loops.

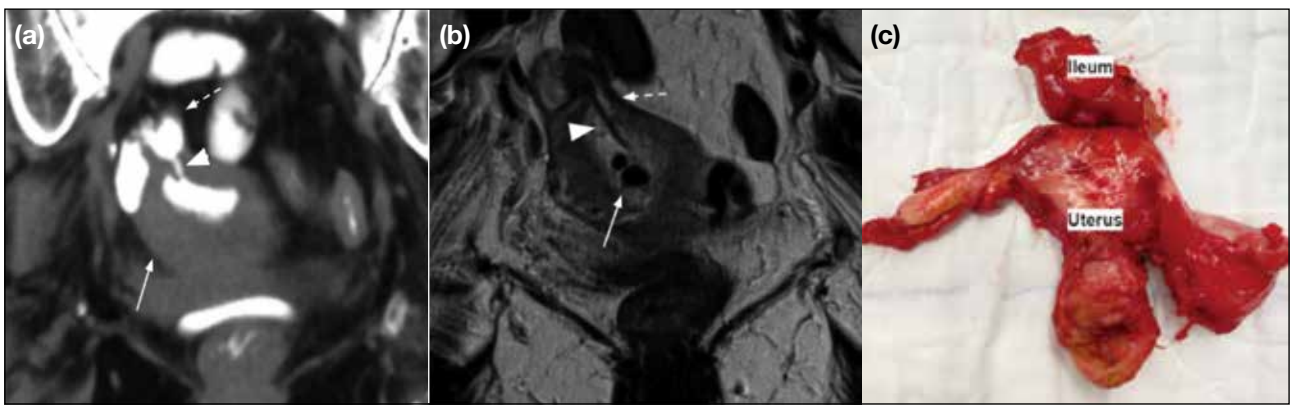

Figure 5. Images demonstrating the ileo-uterine fistula. (a) Coronal reconstruction of computed tomography of the pelvis 1.5 hours after per-oral administration of gastrografin for small bowel follow-through. The lumen of the fistula was opacified by gastrografin (arrowhead), connecting the terminal ileum (dashed arrow) and the uterus (arrow). (b) T2-weighted true fast imaging with steady-state free precession coronal turbo spin echo magnetic resonance imaging of the pelvis. The uterine fundus was adherent to the adjacent ileum with loss of normal Indian ink artefact (dashed arrow) and could suggest adhesion between the two structures due to serositis. Curvilinear and roundish signal voids (arrowhead and arrow) within the endometrial cavity could be due to flow void from peristalsis of small bowel loop and susceptibility artefact from gas inside the cavity. (c) Surgical specimen after partial small bowel resection, hysterectomy, and with bilateral salpingo-oophorectomy. The ileum was adherent to the uterine fundus with ileo-uterine fistula.

normal Indian ink artefact at the fat-fluid interface in this sequence can help detect the loss of fat plane between the uterus and the bowel. The fistula tract was seen only in one sequence since it opened only intermittently under bowel peristalsis. Therefore, MRI images can be obtained along the plane of the fistula with dynamic study for better detection.[4]

Uterine perforation is an uncommon but known risk of endometrial sampling with a reported incidence of 1 to 2 in 1,000 population.[10] Our patient had several risk factors for uterine perforation including a small retroverted uterus and chronic endometritis. The small bowel is a freely mobile intraperitoneal structure and rarely punctured during endometrial sampling. We hypothesise

that the small bowel was relatively fixed to the uterus due to serositis, evidenced by the loss of normal Indian ink artefact between these structures in the coronal T2-weighted trueFISP MRI. The inflammation caused by the presence of ileo-uterine fistula after endometrial aspiration further led to a secondary pyometra.

In summary, ileo-uterine fistula is an extremely rare complication following endometrial aspiration and can cause great morbidity. A high index of clinical suspicion should be maintained and appropriate investigations should be carried out to guide early management.

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