A Case of Sigmoidouterine Fistula Detected by Transvaginal Ultrasonography

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Abstract
An 80-year-old woman, 2 G 2 P, with macrohematuria came to this institution for treatment. On pelvic examination, the uterus was palpated slightly large for her age, slight tenderness and resistance were noted at the uterine corpus, and the adnexa and parametrium were soft. The entire abdomen, including the Douglas pouch and pelvic bottom, were also soft. Examination a the speculum revealed swelling of the vulva and vagina and blood oozing from the entire vaginal wall. There was also a small amount of purulent discharge at the cervical canal. Transvaginal ultrasonography (TVUS) showed the uterine corpus to be small and found no adnexal or pelvic mass. However, the entire uterine cavity was hyperechoic, and these signals were passing through the myometrium near the fundus and ended in a cup-shaped configuration. These features were consistently confirmed on later repeated TVUS examinations. On further interview, the patient disclosed that she had had continual diarrhea and fecal discharges from the vagina for close to one month. The cytology of the smears from both the uterine cervix and cavity were negative, but purulent content was found in the endometrial biopsy specimen. Computed tomography and magnetic resonance imaging revealed no pathologic findings, but a colonic mass lesion adjacent to the uterus was observed although the fistula could not be identified. Innumerable diverticula in the colon and the outlines of barium spillage from the colon were demonstrated on barium enema examination. Colonic fiberscopic examination confirmed the intact colonic mucosa. Of the tumor markers, CA 19-9 and SCC values were normal, while CEA level was elevated (9.8 ng/ml). Surgery revealed a fistula that was perforated from the bottom of the sigmoid diverticulum through the uterine myometrium, and into the uterine cavity. The features of fistulas delineated by the continuous high-echoic signals on TVUS were identical with these pathological findings. The microbubbles of bowel gas in fecal discharges were deemed to be the cause of high echogenicity. These TVUS findings were repeatedly confirmed on later evaluations. A diagnosis of a sigmoidouterine fistula on TVUS should, therefore, be considered when there is fecal discharge. TVUS thus provided crucial and reliable findings of uterine fistula and should warrant use in managing colonic-uterine fistula. The postoperative course was uneventful. CEA concentration decreased to 3.4 ng/ml; cut-off value was 5 ng/ml.

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Keywords
colon diverticulitis, intrauterine hyperechoic signals, sigmoidouterine fistula, transvaginal ultrasonography, Ultrasound diagnosis.

1. Introduction
Sigmoidouterine fistula is a rarely encountered complication that may result from malignancies, diverticulitis, pelvic inflammatory disease, or operative injury. The diagnosis is commonly based on identification of a fistula on contrast roentgenograms like barium enema or hysterosalpingography, and detection of uterine fistula on ultrasonography is infrequently reported. A case of uterine fistula detected on transvaginal ultrasonography (TVUS) in the initial checkup for vaginal bleeding is discussed here.

2. Case Report
An 80-year-old woman, 2 G 2 P, came to this institution for treatment of macrohematuria on 29
Aug 1998. A physician attended her, and her urine was sampled by catheter for urinalysis. No hematuria or bloody discharge from the anus was found, however, although there was a brownish streak on her underclothing, and the vulva was reddish and swollen. The patient was alert, and her vital signs were as follows: body temperature, 36.8°C; blood pressure, 154/88 mm/Hg; and pulse rate, 104/min. The patient was then transferred to the department of gynecology and examined by the author. On pelvic examination, the uterus was palpated slightly large for her age, and mild tenderness and resistance were noted at the uterine corpus, while the adnexa and parametrium were soft. The entire abdomen, including the Douglas pouch and pelvic bottom, were also soft. The speculum revealed grossly swollen vulva and vagina, blood oozing from the entire vaginal wall, and a slight purulent discharge at the cervical canal. Routine TVUS examination using a Sonovista CS (Mochida, Tokyo, Japan) ultrasound system equipped with a 7.5 MHz transducer conducted to assess the pelvis showed the uterine corpus to be small, but no adnexal or pelvic mass was found. However, intrauterine hyperechoic signals delineated the uterine cavity, and, moreover, passed through the myometrium near the fundus at the local posterior wall and ended in a cup-shaped configuration (Fig. 1). In a further interview based on these findings, the patient disclosed that she had had continual diarrhea and fecal discharge from the vagina for close to one month and had had a fever of up to 39°C a few days earlier. The fever had been selfresolved. At this stage, a colonic-uterine fistula was strongly suspected. Blood analyses showed normal hemoglobin level (14.8 g/dl), high white blood cell count (12800/µl), and elevated C-reactive protein level (3.05 mg/dl). Because of her fairly good general condition, the patient was given a prescription for antibiotic levofloxacin and allowed to go home. On 1 September 1998, another blood sampling showed platelet count, total protein concentration, blood urea nitrogen, electrolytes, liver enzymes, and prothrombin time to be normal. Tumor marker CA 19–9 and SCC levels were normal, while CEA concentration was elevated (9.8 ng/ml). The cytology of the smears from both the uterine cervix and cavity were negative, but purulent content was found in the endometrial biopsy specimen. Computed tomography and magnetic resonance imaging revealed a colonic mass lesion 3 to 4 cm in diameter adjacent to the uterus, although the fistula could not be identified. Innumerable diverticula in the colon and the outlines of extramural barium spillage were demonstrated on barium enema examination (Fig. 2). Colonic fiberscope examination confirmed the presence of the intact colonic mucosa.

The patient was admitted on 12 Sep 1998 for a general physical examination and preparation to undergo surgery. Ultrasonography was repeated on the day of admission to confirm the characteristic features of the high-echoic signals (Fig. 3). Spirometry and blood gas analysis was carried out preoperatively, and the complication of respiratory failure of the restrictive type was demonstrated: %VC, 40.3%; FEV₁, 83.5%; pH, 7.403; pO₂, 58.8 mmHg; pCO₂, 49.3 mmHg; and SpO₂, 90.2%.

![Fig. 1 Sagittal view of the uterus on transvaginal ultrasonography. The hyperechoic signals in the uterine cavity led to those in the cup-shaped area, which is adjacent to the uterus and present inside the moving bowel.](image-url)