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# Gynecologic Abscess: CT-guided Percutaneous Drainage

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**ABSTRACT**

A 42-year-old woman with recurrent bilateral endometrial ovarian cystoma presented with fever and pelvic pain caused by a tubo-ovarian abscess (TOA), which was resistant to several varieties of intravenous and oral antibiotics for 2 weeks (Case 1). Computed tomography (CT)-guided diagnostic aspiration for a rapid enlarged right ovarian cystoma through a transabdominal route confirmed that it had developed into a TOA. Subsequent percutaneous abscess drainage (PAD) and irrigation for 3 days were successful. One-year follow-up revealed no recurrence of TOA. A 58-year-old woman with recurrent cervical cancer after external radiation therapy (RT) presented with fever, confusion and tremor caused by pyometra (Case 2). Since transvaginal drainage was impossible due to cervical os obstruction, the patient had undergone CT-guided transabdominal PAD and irrigation for a month. Thereafter, the clinical findings improved and a tracheloplasty was performed to prevent recurrence. CT-guided PAD may be a useful treatment option for gynecologic abscess as a diagnostic aspiration, a temporizing procedure until surgery, or an alternative surgery.

***Key words:*** *Abscess, CT, Percutaneous drainage, Gynecologic organs*

Recently, with the development of interventional procedures, indications for computed tomography (CT) or ultrasound (US)-guided percutaneous abscess drainage (PAD) continue to expand and almost all abscesses in various regions are considered amenable[8]. Previous therapeutic options for gynecologic abscess included antibiotics alone or in combination with US-guided transvaginal drainage or surgical resection[1-3]. Despite the established success of CT-guided PAD for almost all abscesses, the transabdominal approach using this technique[2,7] has not been performed very often for the treatment of gynecologic abscess. This report presents two patients with gynecologic abscesses who had good clinical outcomes by CT-guided PADs.

## CASE REPORT

### *Case 1*

A 42-year-old woman with recurrent bilateral endometrial ovarian cystoma, after having a bilateral oophorocystectomy six years before, presented with fever and pelvic pain. US and magnetic resonance imaging (MRI) showed the rapid enlargement of a right unilocular ovarian cystoma of 8 cm in diameter with a left ovarian cystoma, and right tubal dilatation (Fig. 1A). The bilateral ovarian cystomas also showed hemorrhagic change on MRI. The right rapid-growing cystoma was suspected of having developed into a TOA due to a complicating infection with recent hemorrhage. Since no improvement was obtained using several varieties of intravenous and oral antibiotics for 2 weeks, transabdominal diagnostic aspiration with an 18-gauge needle under CT (SOMATOM Plus4 Volume Zoom; Siemens, Erlangen, Germany) guidance was performed (Fig. 1B). Drab, bloody and purulent fluid was aspirated grossly. Thereafter, a 7F (French) pigtail catheter (Dawson-Mueller drainage catheter, Cook incorporated, Bloomington, IN) was placed immediately using the Seldinger technique under fluoroscopy (Multistar; Siemens, Erlangen, Germany) equipped with CT guidance (Fig. 1C). Approximately 120 ml of purulent fluid was initially aspirated from the catheter. Although the culture was negative, erythrocytosis, leucocytosis, heterophilic leucocytosis, in particular, and histio-

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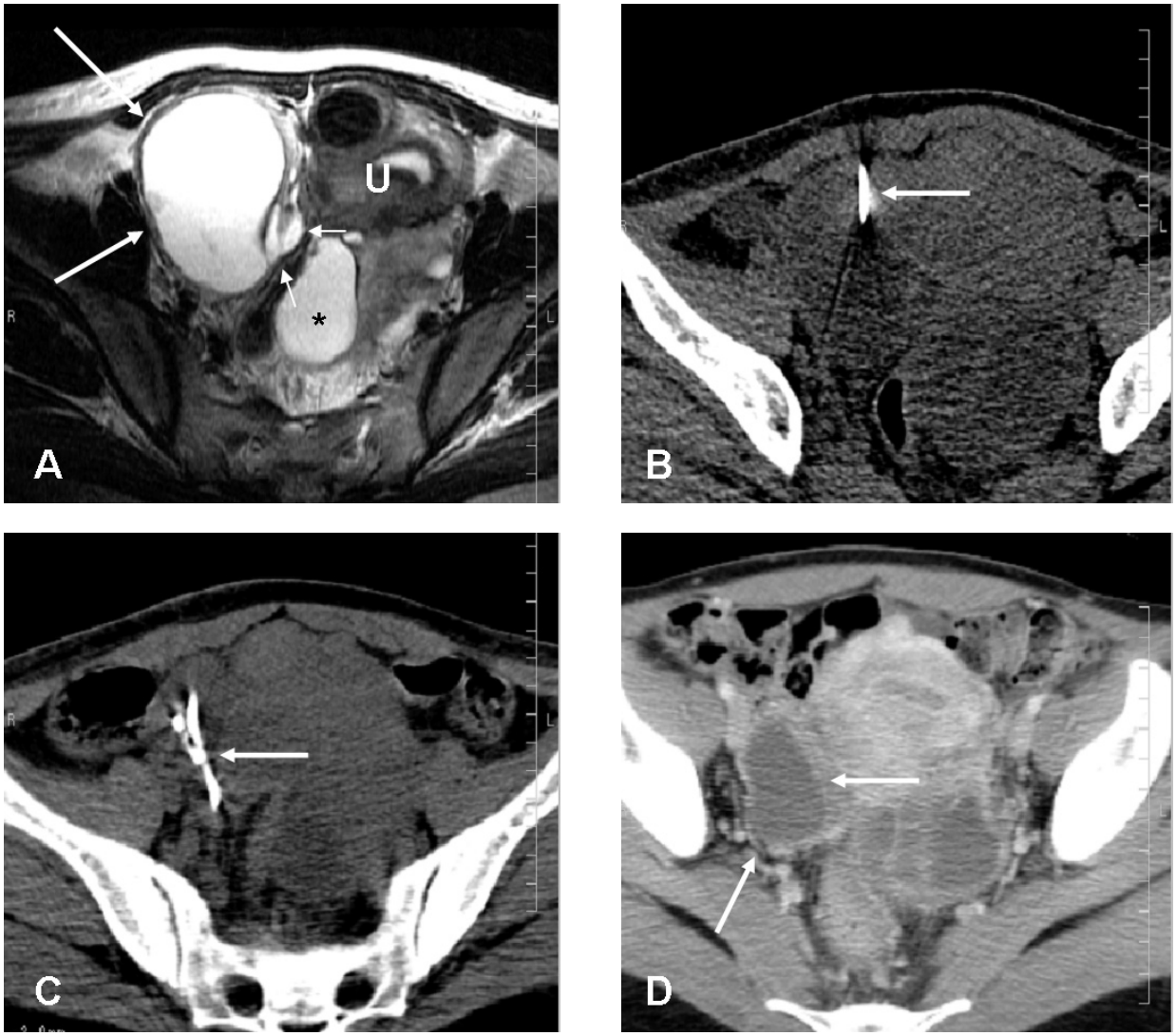


**Fig. 1.** Case 1 with right tubo-ovarian abscess.
(A) T2-weighted axial MRI shows a right unilocular ovarian cystoma of 8 cm in diameter (large arrows) and a right tubal dilatation (small arrows). An asterisk shows a left ovarian cystoma. *U* = uterus. (B) CT-guided transabdominal diagnostic aspiration with 18-gauge needle (arrow) was performed. (C) A 7F pigtail catheter (arrow) was placed through the anterior abdominal wall. 120 ml of purulent fluid was aspirated through the catheter. (D) Right ovarian cystoma (3 cm) remained 40 days after drainage (arrows), however, there was no complication of infection.

cytosis were observed reflecting hemorrhagic and inflammatory changes in the fluid. The catheter was irrigated once a day with saline including an antibiotic for 3 days. Then the catheter was removed because the patient remained afebrile and catheter outputs were very few. The patient was discharged 11 days after PAD. The complication of infection has not recurred for one year despite there remaining a cystoma of 3 cm in diameter (Fig. 1D).

***Case 2***

A 58-year-old woman with recurrent cervical cancer after conization of the cervix due to carcinoma in situ, presented with fever, confusion and tremor. The patient had received an intra-uterine device many years previously. Pyometra had developed due to recurrence of the cervical cancer and it had been improved by repetitive transvaginal drainages. A 12F Neraton catheter had been accidentally broken and had migrated into the uterus during the repetitive drainages. Steroid medication due to interstitial pneumonia was performed together. Two weeks after the external radiation therapy (RT) of 60 Gy, the patient was admitted to our intensive care unit in an emergency due to septic shock. US and CT showed recurrent pyometra of 8 cm in diameter (Fig. 2A) despite shrinkage of the cervical tumor. US-guided transvaginal drainage was attempted, however, it was impossible due to cervical os obstruction. Therefore, CT and fluoroscopy-guided transabdominal PAD was performed using the Seldinger technique. Approximately 120 ml of malodorous, bottle-green and purulent fluid was initially aspirated from a placed 7F pigtail catheter (Fig. 2B, C). The cultures were gram-positive coccus and

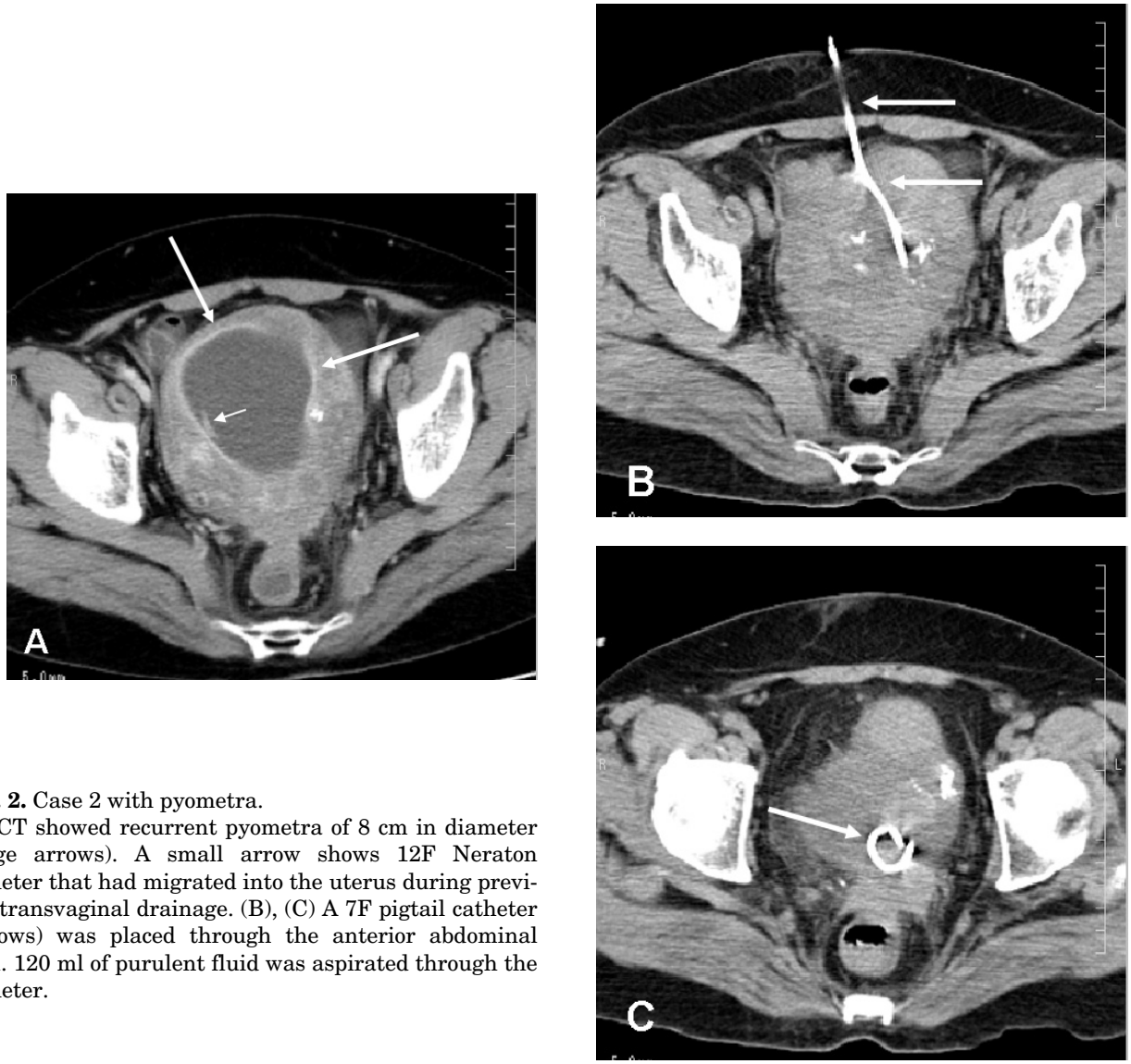


**Fig. 2.** Case 2 with pyometra.
(A) CT showed recurrent pyometra of 8 cm in diameter (large arrows). A small arrow shows 12F Neraton catheter that had migrated into the uterus during previous transvaginal drainage. (B), (C) A 7F pigtail catheter (arrows) was placed through the anterior abdominal wall. 120 ml of purulent fluid was aspirated through the catheter.

streptococcus. By irrigation of the catheter once a day with saline and intravenous antibiotic treatment for a month, clinical findings were improved. Then, as a surgical treatment, tracheloplasty of the cervical canal dilatation and intra-uterine draining was performed in order to prevent re-obstruction of the cervical os. The intra-uterine cavity was clear on intraoperative hysteroscope examination and the foreign bodies including an intrauterine device and a Neraton catheter were also removed together. Following this procedure, the transabdominal catheter was removed 4 days after the operation. After additional external RT for para-aortic lymph node metastasis, the patient was discharged 3 months after PAD.

## DISCUSSION

Our current preferable guidance of PAD for pelvic abscess is CT. CT enables us to visualize the entire pelvic space even if there are distended bowels that detract from US examination[8]. It also enables better visualization of surrounding structures to avoid transgression of the adjacent bowel, blood vessels or bladder[2,7]. In both our patients, abscesses were juxtaposed to bowels cranio-ventrally in the pelvis. We therefore chose a lower level than the depicted bowel as an approach. In general, CT is adequate for deep abscesses and US for superficial abscesses[6,8]. However, for superficial abscesses, CT is also easy and feasible for PAD.

CT brings with it the disadvantage of radiation exposure of a dose that does not occur in US. During insertion of the needle for CT-guidance, we routinely attempt to decrease the scan area and slices (e.g. cases 1, 2: a scan area of 17.5 mm at intervals of 2.5 mm) and reduce the scanning current (e.g. case 1: 120 kV/160 mA; case 2: 120 kV/300 mA) as much as we possibly can, in order to minimize radiation exposure to patients. Our patients received 12 mSv and 24 mSv of radiation exposure per scan, respectively. Consequently, during the whole process of needle insertion, including the initial scan to determine the access route, they received 92 mSv and 116 mSv of CT radiation

exposure, respectively. Furthermore, this dose was to the local area. We believe these doses are acceptable considering the safety of CT-guidance.

Advanced-stage endometriosis might increase the risk of TOA due to the fact that immunologically aberrant disease makes the patient vulnerable to infection, the cystic wall, unlike healthy ovarian epithelium, is susceptible to bacterial invasion, and bloody content serves as a culture medium and facilitates the spread of infection[4]. In case 1, hemorrhage into ovarian cystoma was considered the main trigger of infection. Standard therapy for TOA consists of antibiotics. In cases where treatment fails, surgery has been traditional[2]. PAD is useful not only for drainage treatment but also for confirmed diagnosis of abscess by aspiration. The success rate of PAD for TOAs is 80–90%[2,7]. The authors[2,7] preferably used CT as a guidance for the same reason as ours which we have stated above. Case 1 was nulliparous and hoped for pregnancy in the future. Avoiding sterility is an important matter for nullipara. Sterility was avoided by using PAD[2,7]. It would have been difficult to avoid by hystero-oophorectomy due to severe inflammatory adhesion from surgery.

Pyometra is usually associated with or followed by RT for malignant disease of the uterus[1,3,5]. It should be treated promptly and vigorously by evacuation and continued drainage of the uterine cavity[3,5], particularly, in septic shock[5] such as in case 2. Post RT cervical stenosis[1,3] was considered the main cause of pyometra. Transvaginal dilatation, drainage and curettage are usually preferable for evacuation in patients with pyometra[1,3,5]. As the cervical os was completely occluded in case 2, transvaginal drainage was impossible[1,2]. In such conditions, laparotomy is usually the second line treatment[3,5]. Contrary to this, Babarinsa et al[1] advocated uterine fundus puncture through a transabdominal approach. However, they did not describe any guidance for PAD. To our knowledge, there has been no report specifying CT as guidance for uterine drainage. We believe that CT-guided transabdominal PAD may be safe and useful when a transvaginal approach is difficult. In case 2, PAD was useful as an emergent and temporizing procedure.

Many authors[2,6,7] matched 7–14F drainage catheters, depending on the size of the abscess and the viscosity of the fluid aspirated. Meanwhile, we have routinely initially placed a 7F catheter for abdominal and pelvic abscesses regardless of their size and viscosity, and thereafter upsized the catheter when there has been ineffective drainage because we believe that a smaller sized-catheter is more pain-relieving during the procedure and catheter placement. In our patients, 7F size was acceptable for 3 days and a month's drainage and irrigation, respectively. In case 2, the intra-uterine cavity was clear on intraoperative examination, which means that drainage was very effective.

Fortunately, our patients had unilocular abscess and no communication to the gastrointestinal (GI) tract. In general, the success rate of PAD is lower for abscesses that have septations or structures like septations or communications to the GI tracts[2,7,8]. On such occasions, using larger or multiple catheters may be more effective and necessary[7].

A problem of PAD is the possibility of recurrence as long as there are underlying conditions[2,3,5,7]. Therefore, continued medication for endometriosis and tracheloplasty for cervical os occlusion were performed after PADs.

Complications related to PAD, including septicemia, hemorrhage, and bowel laceration are rare (0–6%)[2,6-8]. In addition to its safety, PAD is more cost-effective and has a shorter hospitalization period than surgery[7].

In conclusion, we have presented two patients with TOA and pyometra who showed good clinical outcomes by CT-guided PADs. It may be a useful treatment option for gynecologic abscess as a diagnostic aspiration, a temporizing procedure until surgery, or an alternative surgery.

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