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Case Report

Percutaneous trans-bladder drainage of a pelvic abscess caused by sigmoid diverticulitis: Two case reports ☆☆☆

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ABSTRACT

Sigmoid diverticulitis can potentially lead to the development of pelvic abscesses. Mortality rate from intra-abdominal abscesses is as high as 35%, and patients with diverticulitis complicated by an abscess are at a high risk of recurrent diverticulitis. Recently, image-guided drainage has been performed using computed tomography or ultrasonography for the treatment of pelvic abscesses. Standard radiological pelvic abscess image-guided drainage methods consist of transabdominal, transgluteal, or cranio-caudal puncture approaches. However, these standard approaches have technical limitations due to intrapelvic organ structures. Therefore, we performed image-guided drainage using a percutaneous trans-bladder approach with a simpler 1-step puncture method and a less invasive 7-Fr drainage catheter in 2 cases of a 72-year-old female and a 53-year-old female with relapsed pelvic abscesses complicated by sigmoid diverticulitis due to difficulties involving the standard approach. The abscesses in both cases disappeared on follow-up computed tomography scans, demonstrating no pelvic abscess recurrence. Our results showed that trans-bladder image-guided drainage is an effective alternative method for treating pelvic abscesses.

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Introduction

A pelvic abscess (PA) is a collection of infected fluid in the pouch of Douglas, the fallopian tube, ovary, or parametrium. A PA sometimes occurs as a complication after surgery [1]. In addition, PAs can also be associated with several medical conditions, such as sexually transmitted diseases, pelvic inflammatory disease, appendicitis, diverticulitis, and Crohn's disease [2]. Further, the mortality rate from intra-abdominal abscess is as high as 35% [3], and patients with diverticulitis complicated by an abscess are at a high risk of recurrent diverticulitis [4].

Recently, image-guided drainage (IGD) has been performed using computed tomography (CT) and ultrasonography (US) to treat PAs. However, the performance of PA-IGD with a transabdominal, transgluteal, transvaginal, or cranio-caudal puncture approach has technical limitations due to the anatomical location of visceral organs, bone structures, and nerve routes [5–9]. In these challenging PA cases, Raj et al. reported the efficacy and safety of PA-IGD using a trans-bladder approach with an 8-10-Fr drainage catheter [10]. We modified the trans-bladder IGD method using a simpler 1-step puncture method and a less invasive 7-Fr drainage catheter, and we report 2 cases of trans-bladder IGD of PA complicated by sigmoid diverticulitis.

Case report

Case 1

A 72-year-old female, with diabetes and a clinical history of sigmoid colon diverticulitis complicated by an abscess, presented with hematochezia and abnormal blood test values of white blood cells (WBCs) ($11,500/\text{mm}^3$) and C-reactive protein (CRP) (2.25 mg/L). A PA measuring 4.5×2.6 cm, induced by relapsed sigmoid diverticulitis, was diagnosed on a CT scan. During hospitalization, PA-IGD was requested by physicians because of resistance to the initial antibiotic therapy (ceftazidime sodium 3 g/d). Therefore, we decided to perform trans-bladder IGD because the CT scan revealed that the PA was located at the perivesical space surrounded by the bladder and uterus.

After Foley catheter insertion, we used the drainage instrument set (Hanaco Drainage Kit-450, Hanaco Medical, Japan) to perform trans-bladder PA-IGD. The PA was punctured using an 18-gauge Chiba needle with CT guidance at the spine position after local anesthesia, and a 7-Fr pigtail catheter was inserted into the PA using 0.035-inch wire (Fig. 1). The following day, the WBC and CRP counts were improved, at $7300/\text{mm}^3$ and 0.22 mg/L, respectively. Hematuria persisted

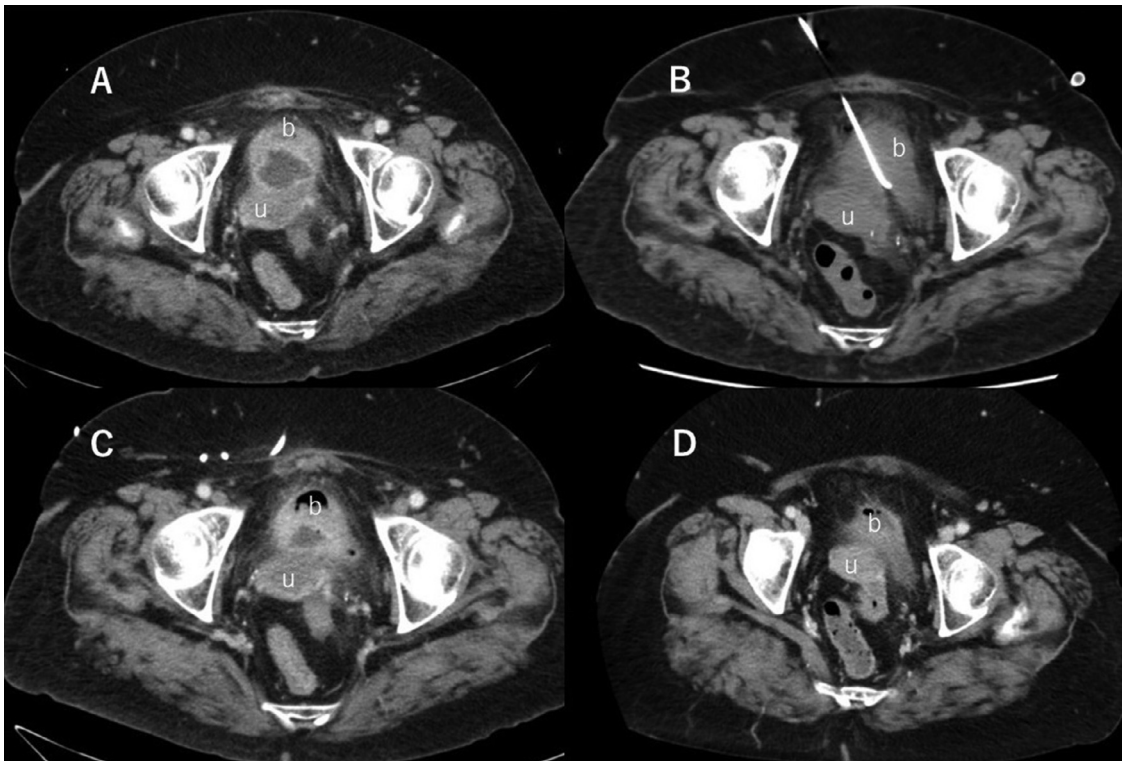


Fig. 1 – (A) The pelvic abscess (PA) (4.6×2.6 cm) was observed on computed tomography (CT) scan in case 1, surrounded by the bladder (b) and uterus (u). (B) A 7-Fr pigtail catheter was deployed in the PA using CT image guidance. (C) The PA decreased to 2.8×1.1 cm on a CT scan 7 days after the drainage. The 7-Fr pigtail catheter was removed spontaneously. (D) The PA disappeared completely 14.6 months after the drainage but a sigmoido-vesical fistula was newly recognized.



Fig. 2 – (A) The pelvic abscess (PA) (5.4 × 3.4 cm) was observed on computed tomography (CT) scan in case 2, surrounded by the bladder (b) and uterus (u). **(B)** The PA was punctured using ultrasonography guidance via the bladder. **(C)** The 7-Fr pigtail catheter was deployed successfully in the PA. **(D)** The PA disappeared completely on the CT scan 2.7 months after the drainage.

for a few days after drainage but resolved spontaneously. The drainage catheter was removed 7 days after drainage, while antibiotic therapy was maintained (cefmetazole sodium 3 g/d). Finally, the patient could be discharged 17 days after the drainage; she demonstrated a decreased PA size on follow-up CT scans performed 7 days, 2.1 months, 11.9 months, and 14.6 months postdrainage. However, because of a newly recognized sigmoido-vesical fistula 14.6 months after the drainage, endoscopic treatment and colostomy were performed, with no PA relapse after surgery.

Case 2

A 53-year-old female, who had chronic kidney disease and a clinical history of ileostomy for sigmoid diverticulitis complicated by abscess, presented with abnormal blood test values of WBCs ($11,900/\text{mm}^3$) and CRP (15.01 mg/L) and complained of back pain. A PA measuring 5.3×3.4 cm was detected on a CT scan. The PA was induced by sigmoid colon diverticulitis and was located at the perivesical space surrounded by the bladder and uterus on a CT scan. The bladder completely collapsed due to anuria. We performed trans-bladder IGD of the PA due to resistance to initial antibiotic therapy (tazobactam, piperacillin hydrate 6.75 g/d) and anatomical limitations. We used the same method and drainage instrument set according to US guidance and succeeded to deploy a 7-Fr pig-

tail catheter into the PA (Fig. 2). WBC and CRP values were completely normalized in 11 days. The size of the PA also decreased on follow-up CT scans performed 5 days, 0.7 months, and 2.7 months after the drainage. The patient was discharged 37 days postdrainage and the 7-Fr pigtail catheter was removed 61 days postdrainage. Relapsed PA was not observed in the follow-up period of 16.9 months.

Discussion

Trans-bladder PA-IGD with a 1-step puncture method and 7-Fr drainage catheter is simple, safe, and effective. It is comparable to Raj's trans-bladder approach and other puncture approaches [10]. Technically, the supine position in the trans-bladder PA-IGD procedure also improves patient tolerance of the drainage process, as maintaining the supine position is easier compared to the prone position. The percutaneous suprapubic drainage approach is already an established procedure for urinary diversion. In addition, it is possible that the use of a 7-Fr drainage catheter alone is sufficient to treat large PAs of more than 5 cm as in case 2 [11].

Therefore, the establishment of the trans-bladder PA-IGD method in addition to existing drainage methods may increase the probability of successful treatment of PA.

The incidence rate of fistulas caused by colon diverticular disease is approximately 4%-20% and sigmoido-vesical fistula is the most common (65.0%) [12]. In case 1, trans-bladder PA-IGD was considered not to cause the sigmoido-vesical fistula, as the drainage catheter tract was located away from the point of the sigmoido-vesical fistula of the bladder dome. Moreover, in previously reported cases of trans-bladder IGD of PA (n = 16), the sigmoido-vesical fistula was not observed as a complication [10,13]. The relatively long period of PA shrinking in case 1 may have influenced the formation of sigmoido-vesical fistula.

Abscess formation is a complication of acute colonic diverticulitis, occurring in 17%-19% of complicated cases [14]. The recurrence rate of colonic diverticulitis with abscess and perforation is very high (72.0%) [4]. Moreover, in sigmoid diverticulitis cases with an abscess, PA cases demonstrate an almost 3 times higher failure rate (51.0%) of nonoperative management compared with pericolic abscess cases (18.0%) [15]. Other risk factors of failure of nonoperative management of diverticulitis complicated by abscess include immunosuppression, diabetes, renal failure, abscess larger than 5 cm, and extraluminal air with more than 20 locules [11,16–18]. Therefore, in these compromised PA cases, sufficient medical follow-up with blood tests and CT scans is needed after PA-IGD.

In addition, the PAs induced by sigmoid diverticulitis in this study were recurrent diseases and disappeared after drainage. Gaertner et al. concluded that approximately one-third of patients with acute diverticulitis complicated by abscess had a recurrence after the initial nonoperative management and that most recurrences could again be successfully managed nonoperatively [11]. Thus, trans-bladder IGD can also be an effective treatment option for relapsed PAs.

In conclusion, trans-bladder IGD is a safe and effective treatment option for initial and relapsed PAs and an alternative approach to the standard puncture procedure.

Ethical approval

All procedures were performed in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Institutional Review Board approval was not required for this study as it was a case report.

Patient consent

Written informed consent was obtained from the patient for the publication of this report and any accompanying images.

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