ORIGINAL ARTICLE

Percutaneous drainage as an rapid procedure for deep pelvic abscess in the emergency department

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ABSTRACT

BACKGROUND: Drainage of pelvic abscesses is interventional procedures that should be well planned due to organ contiguity. There are not enough publications in the literature evaluating the treatment methods of pelvic abscess drainage and comparing success rates.

METHODS: In this study, 15 patients who underwent pelvic abscess drainage in our interventional radiology unit between June 2017 and December 2019 were retrospectively included. Abscess size, abscess characteristics, the method of access to abscess (transrectal, transvaginal, transgluteal), and drainage treatment procedure (needle aspiration, catheter treatment) were evaluated statistically in terms of effects on the success of treatment.

RESULTS: Of the 15 patients included in the study, 6 (40%) were male and 9 (60%) were female, with a mean age of 31.6 years.In 2 of the patients treated with needle aspiration alone, the abscess collection was repeated and the second procedure was performed. In our study, the technical success was 100% and the complete clinical success was 80%. None of the patients underwent open surgery due to abscess after drainage treatment.

CONCLUSION: In conclusion, endocavitary and percutaneous drainage treatments of pelvic abscesses are safe and effective treatment methods. The success of needle aspiration treatment is lower than catheter treatment and it should be considered that the abscess collection may recur.

Keywords: Access point; complication; drainage; pelvic abscess; percutaneous; success; transgluteal; transrectal; transvaginal.

INTRODUCTION

Abscesses are localized collections of purulent fluid that can occur anywhere in the body. Abscesses are typically surgically drained out through various methods, and laparotomy is the main method in use. As a result of the advances in imaging and catheter technologies, nowadays, abscesses can be safely drained by transluminal procedures through the percutaneous approach, and the need for laparotomy is gradually decreasing.[1,2] However, in patients who have abscesses in the pelvic region, percutaneous drainage is not always possible due to the difficulties posed by the relative positions of the bladder, bowel segments, and pelvic bone. In such cases, the transrectal and transvaginal approaches are generally used for pelvic abscess drainage, and computed tomography (CT) is used when ultrasound-guided transluminal access is not possible. In this retrospective study, we have compared the effectiveness of various drainage methods in patients with pelvic abscess in various locations and of various causes.

MATERIALS AND METHODS

Patients

A total of 15 patients who underwent pelvic abscess drainage at our interventional radiology unit between June 2017 and December 2019 were included. The Kütahya University of

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Health Sciences Ethics Committee provided ethical approval (approval no. 15/01/2020-E.583) for this study. Patients with pelvic pain, increased levels of acute-phase reactants, positive microscopic findings for aspiration material, or positive abscess culture were included. Patients with other fluid collection (lymphocele, hematoma, etc.) and who could not be followed up after the procedure were excluded.

Procedure

All abscess drainage procedures were performed by two interventional radiologists with 8 and 6 years of experience. For abscess drainage, the shortest access path that was not close to risky anatomical structures, such as bowel loops and vascular structures, was selected. All patients were started on broad-spectrum antibiotics before the procedure, and in patients with coagulopathy, fresh frozen plasma was administered to achieve a platelet count >50,000/mm^3 and an INR score <1.5. All percutaneous and transgluteal procedures were performed by the induction of local anesthesia with subcutaneous 10 cc lidocaine. Transrectal and transvaginal procedures were performed with the patient under deep sedation in the operating room. Before these two procedures, the American Society of Anesthesiologist scores of all the patients were <3 (range, 1–2) (Fig. 1a and b). Transgluteal and transrectal abscess drainage procedures were performed with 8 French (F) or 10F drainage catheters by the Seldinger technique. CT-guided drainage was performed in five patients who underwent transgluteal procedures (Fig. 2a and b). All transvaginal procedures were performed by aspiration with an 18G Chiba needle, and no drainage catheter was inserted.

During drainage, the abscess was sampled to obtain an antibiogram. Nurse of surgery was informed consent catheter care. The drainage catheter was removed if the abscess collection disappeared in the control ultrasonogram or CT scan if the patient's clinical symptoms (such as fever and acute phase reactant elevation) had started to regress, and if the volume of drainage fluid had decreased to below 10 cc within 24 h.

Outcomes

Technical success was defined as access to the abscess focus and successful achievement of abscess drainage after the

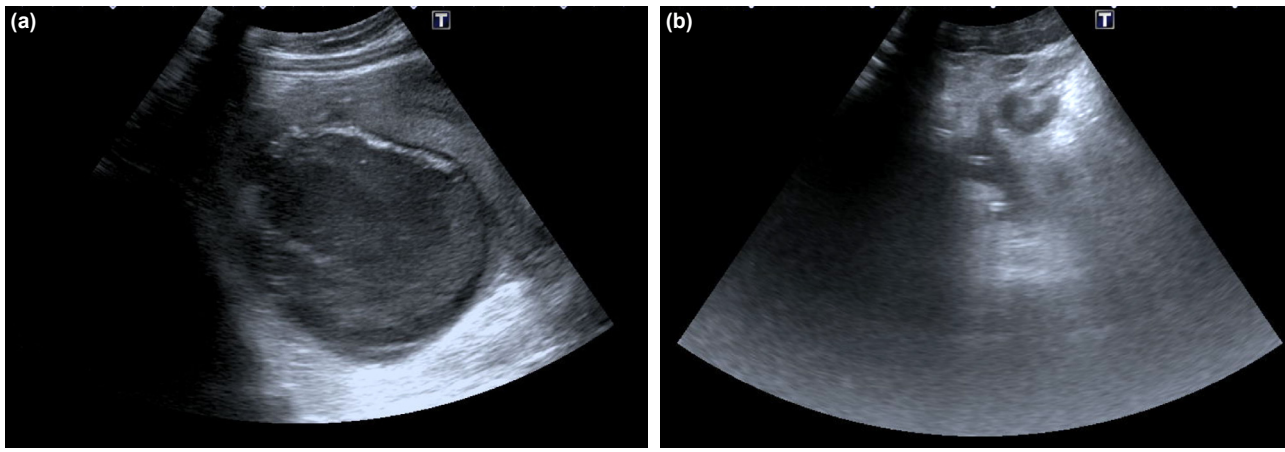

Figure 1. (a) In the ultrasonography examination of the patient who developed pelvic abscess after appendectomy operation, the abscess collection is observed at posterior of the bowel loops and uterus. **(b)** After transrectal catheter drainage, a reduction in the abscess collection was observed.

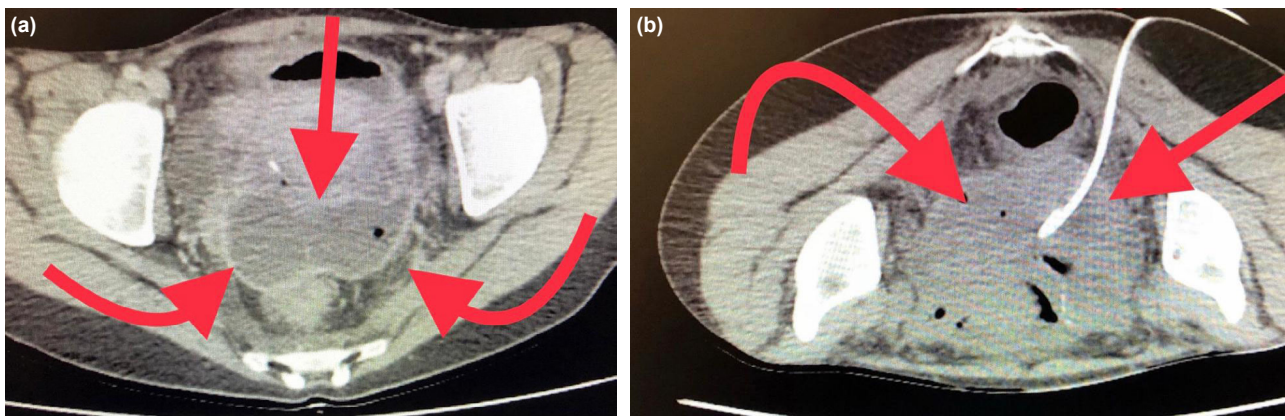

Figure 2. (a) The patient who followed up with the diagnosis of inflammatory bowel disease, abscess collection was observed in the uterus posterior. **(b)** Transgluteal drainage catheter was performed in the prone position under CT guidance. The abscess puncture was performed laterally of the piriformis muscle.

procedure. Clinical success was defined as clinical and radiological disappearance of the abscess without additional intervention. Partial clinical success was defined as a reduction in abscess collection and the need for a second procedure. Ineffective drainage and the need for open surgery were considered to indicate failure of the procedure.

Statistical Analysis

All data were analyzed with the Statistical Package for the Social Sciences (version 21) software. All data were normally distributed according to the Kolmogorov–Smirnov test. The descriptive data of our study are presented as the mean and standard deviation. The relationship between clinical success of abscess drainage and the abscess access and drainage method was evaluated by Pearson correlation coefficient analysis. Based on the value of the correlation coefficient, the correlation was evaluated as follows: $r \geq 0.8$, excellent; $0.8 \geq r \geq 0.6$, good; $0.6 \geq r \geq 0.4$, medium; $0.4 \geq r \geq 0.2$, weak; and $r \leq 0.2$, absent. $P<0.05$ was considered to indicate statistical significance.

RESULTS

Patient Data

Of the 17 patients who underwent pelvic abscess drainage at the interventional radiology unit between June 2017 and December 2019, two were excluded from the study because their registration information was not available. Of the 15 patients who met the inclusion criteria and were included, 6 (40%) were male and 9 (60%) were female. The mean age of the patients was 31.6±3.32 years (range, 10–51 years). In 12 patients (80%), the abscess collections were unilocular, and in 3 cases, the abscess collections were multilocular and septate (20%). Two patients had multiple abscess foci. The long diameter of the abscess collections ranged from 4 cm to 10 cm (mean, 6.3±1.03 cm). The most common cause of pelvic abscess was post-operative complications: 5 patients had undergone appendectomy; 3 patients had surgery for tumors; and 5 patients had gynecological procedures. The diagnosis of post-operative abscess collection was made between the 11th and 23th day after surgery and was detected on the 16th day (on average). The remaining two patients (who had not undergone any procedure) had inflammatory bowel disease.

Procedures and Outcomes

Drainage procedure was performed percutaneously in 5 patients, transrectally in 6 patients, and transvaginally in 4 patients. All the drainage procedures were met with technical success. In 3 patients who underwent transvaginal and transrectal abscess drainage, a second procedure was required for abscess collection. A second drainage procedure was performed in patients with prolonged clinical symptoms, such as fever and increased levels of acute-phase reactants, and those who had abscess collection based on ultrasonography or CT findings. Complete clinical success was achieved in 12 of the 15 patients, so the success rate was 80%. In the three patients who required a second procedure, the drainage catheter had not been placed.

Correlation between Drainage Method and Outcome

The descriptive findings related to the relationship of abscess access and drainage method with complete clinical success are presented in Table 1. 8F and 10F catheters were used for drainage, but there was no correlation between catheter size and technical success of the procedure (r=–0.134, p=0.635). However, there was a significant difference between the patients who underwent catheter drainage and only needle aspiration in terms of complete clinical success. An excellent correlation was found between the abscess drainage method and complete clinical success (r=0.829, p<0.001). However,

Table 2. Pearson correlation test of the complete clinical success of abscess drainage with access drainage methods, cyst structure, and catheter size

Parameters affecting treatment success	(r)	p-value
Abscess access method	0.456	0.87
Abscess drainage method	0.829	<0.001
Cyst structure (unilocular, multilocular/septate)	0.167	0.553
Catheter size	-0.134	0.635

r: Pearson correlation coefficient, p<0.05 is considered statistically significant.

Table 1. Descriptive data showing the relationship of access and drainage methods with the clinical success of the treatment

Abscess access method	Abscess drainage method	Unsuccessful	Successful	Total
Percutaneous	Catheter drainage		5	5
	Needle aspiration			
Transrectal	Catheter drainage		4	4
	Needle aspiration	1	1	2
Transvaginal	Catheter drainage			
	Needle aspiration	2	2	4
Total		3	12	15

the abscess access method (r=0.456, p=0.87) and abscess structure (r=0.167, p=0.553) were not significantly correlated with complete clinical success (Table 2). None of the patients required open surgery after drainage procedure; therefore, the procedure was not unsuccessful in any of the cases. Further, no procedure-related major complications occurred in any of the patients included in the study.

DISCUSSION

The present study reports the success and post-operative complications of various approaches to pelvic abscess drainage. The findings indicate that the type of drainage procedure does have a significant influence on the success of the drainage.

The present findings indicated that post-operative complications were responsible for 80% of the pelvic abscesses. In a similar study, Gervais et al.[3] reported that 48% of abdominopelvic abscesses are associated with post-operative complications. Further, in Akıncı et al.[4] study, 144 of 185 (77.3%) pelvic abscesses occurred in the post-operative period. Thus, the findings of this study are in agreement with previous reports.

In the literature, the success of percutaneous abscess drainage procedure has been reported to vary between 68% and 100%.[5] However, there are few publications in the literature that evaluate the success of pelvic abscess drainage. In one such study, Akıncı et al.[6] reported a 91% success rate for intraperitoneal abscess drainage, and a 93.9% success rate for pelvic abscess drainage was reported in some other studies.[4] Further, in the studies of Ballard et al.,[7] the technical success rate of transrectal and transvaginal drainage procedures was 95%; the complete clinical success rate was 63%; and the partial clinical success was 94%. Consistent with the published literature, in our study, the technical success rate was 100%, the complete clinical success rate was 80%, and the partial clinical success rate was 100%.

It has been reported that drainage procedure is successful for single, small, and non-complex abscess formations.[1,4,8,9] In particular, Benoist et al.[10] reported that drainage success decreases if the abscess size is >5 cm. However, in our study, it was observed that abscess size and features did not affect the success of the procedure. In fact, we observed that clinical success was affected only in patients who underwent abscess drainage with needle aspiration (in whom the complete clinical success rate was only 50%). Similarly, Mehendiratta et al.[11] also reported that catheter drainage had a higher success rate than needle aspiration alone. Finally, in the present study, no significant correlation was found between complete clinical success and abscess structure, catheter size, or abscess access.

In the studies of Akıncı et al.,[4] it was found that drainage procedure failure was associated with the presence of fistula. Ballard et al. and Saokar et al.[7,12] reported that the need for open surgery after transvaginal drainage procedure was significantly higher in patients with tubo-ovarian abscess and symptomatic ovarian cyst. However, no fistula was detected in any of the patients who were included in our study, and none of the patients had tubo-ovarian abscess or ovarian cyst. This might explain why the procedure had not failed in any of the patients.

The main limitation of our study is its retrospective design. In addition, the duration of catheter placement for each method was not compared, and the tolerance of the patients to the procedure was also not evaluated.

Conclusion

In conclusion, the present findings imply that the complication rate of endocavitary and percutaneous abscess drainage is low, and these methods have high technical and clinical success rates. However, the clinical success rate of needle aspiration drainage was lower than that of catheter drainage and required follow-up intervention. Since emergency drainage is mandatory for patients admitted to the emergency department with pelvic abscess, catheter drainage should be considered as an effective and safe method that is minimally invasive in the emergency departments. In addition to this, in the literature, this will be a great reminder for physicians one in acute treatment modality of pelvic abscess.

Ethics Committee Approval: This study was approved by the Kütahya University of Health Sciences Ethics Committee (Date: 15.01.2020, Decision No: E.583).

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Conflict of Interest: None declared.

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ORİJİNAL ÇALIŞMA - *ÖZET*

Acil serviste derin pelvik apse için hızlı işlem: Perkütan drenaj

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AMAÇ: Pelvik apselerin drenajı, organ yakınlığı nedeniyle iyi planlanması gereken girişimsel prosedürlerdir. Literatürde pelvik apse drenajının tedavi yöntemlerini değerlendiren ve başarı oranlarını karşılaştıran yeterli yayın bulunmamaktadır.
GEREÇ VE YÖNTEM: Bu çalışmaya Haziran 2017 ve Aralık 2019 tarihleri arasında girişimsel radyoloji birimimizde pelvik apse drenajı yapılan 15 hasta geriye dönük olarak alındı. Apse büyüklüğü, apse özellikleri, apse erişim yöntemi (transrektal, transvajinal, transgluteal) ve drenaj tedavi prosedürü (iğne aspirasyonu, kateter tedavisi) tedavinin başarısı üzerindeki etkiler açısından istatistiksel olarak değerlendirildi.
BULGULAR: Çalışmaya alınan 15 hastanın altısı (%40) erkek, dokuzu (%60) kadın olup ortalama yaşları 31.6 yıldı. Sadece iğne aspirasyonu ile tedavi edilen hastaların ikisinde apse koleksiyonu tekrarladı ve ikinci işlem yapıldı. Çalışmamızda teknik başarı %100 ve tam klinik başarı %80 idi. Hiçbir hastaya drenaj tedavisi sonrası apse nedeniyle açık cerrahi uygulanmadı.
TARTIŞMA: Sonuç olarak, pelvik apselerin endokaviter ve perkütan drenaj tedavileri güvenli ve etkili tedavi yöntemleridir. İğne aspirasyon tedavisinin başarısı kateter tedavisinden daha düşüktür ve apse koleksiyonunun tekrarlayabileceği göz önünde bulundurulmalıdır.
Anahtar sözcükler: Başarı; drenaj; erişim noktası; komplikasyon; pelvik abse; perkütan; transgluteal; transrektal; transvajinal.

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