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Drainage of Deep Pelvic Abscesses Using Therapeutic Echo Endoscopy

Background and Study Aims: The purpose of this study was to evaluate the clinical efficacy of endosonographically guided transrectal aspiration and drainage by plastic stent of deep pelvic abscesses, using a therapeutic echo endoscope device.

Patients and Methods: Between September 2000 and June 2001, 12 patients (nine men, three women, mean age 67 years) were treated for a perirectal or a pelvic abscess using an endoscopic ultrasound (EUS) technique. The drainage of these fluid collections was performed under EUS guidance, using therapeutic EUS scopes with a large working channel.

Results: No major complication occurred during this study. Transrectal stent insertion succeeded in nine patients. In three patients, only aspiration was possible. Among the nine patients in whom a stent was successfully introduced into the fluid collection, complete drainage without relapse was achieved in eight patients (mean follow-up 10.6 months, range 6 – 14 months). The stent was removed endoscopically after 3 to 6 months. Drainage was incomplete in one patient (with a large abscess, diameter > 8 cm), who subsequently underwent surgical drainage. However, two out of the three patients in whom aspiration alone was performed developed a recurrence of the abscess and required surgical treatment.

Conclusion: EUS-guided drainage of deep pelvic abscesses could offer an alternative treatment to surgery in the management of these postoperative complications.

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Introduction

Pelvic abscesses occur frequently after obstetric surgery and also after rectal resection for cancer [1]. As an alternative to traditional surgical transrectal or transgluteal drainage, we examined the efficacy of endoscopic ultrasound (EUS)-guided drainage of deep abscesses which were not accessible by percutaneous, transabdominal, or transvaginal routes, using a flexible echo endoscope with a large working channel. Ultrasonographically guided transrectal and transvaginal methods of aspiration and catheter drainage of gynecological pelvic abscesses have been reported in the literature as having a high rate of success [2 – 6]. The purpose of this study was to evaluate the clinical efficacy of EUS-guided transrectal aspiration and drainage by a plastic stent of deep pelvic abscesses using a therapeutic echo-endoscope device.

Patients and Methods

Between September 2000 and June 2001, 12 patients (nine men and three women; mean age 67, range 48 – 77) were treated for perirectal or pelvic abscess, using an EUS-guided technique (Table **1**). In 11 patients the abscess formed after pelvic surgery (anterior resection for rectal carcinoma in ten and total hysterectomy for carcinoma of the cervix in one). In one patient with acute leukemia, in whom surgery and general anesthesia were contraindicated, the abscess was due to sigmoiditis.

These fluid collections were drained under EUS guidance, using therapeutic EUS scopes with a large working channel. The EUS scopes used were the FG 38X (with a 3.2-mm working channel, allowing the use of accessories up to 8.5 Fr) and the EG 38UT (with a working channel of 3.8 mm, allowing the use of accessor-

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Table 1 The clinical features and outcomes in 12 patients undergoing endosonographically guided drainage of deep pelvic abscesses

Patient no.	*Localization of the abscess*	*Underlying pathology, type of surgery*	*Size of fluid collection*	*Type of drainage*	*Complications*	*Results*	*Follow-up*
1	Perirectal	Anterior resection for rectal cancer	36 × 34 mm	Aspiration only	None	Relapse 10 days later	Surgical drainage
2	Perirectal	Anterior resection for rectal cancer	51 × 48 mm	Transrectal stent (10 Fr)	None	Complete drainage	No relapse after 13 months
3	Perirectal	Anterior resection for rectal cancer	55 × 50 mm	Transrectal stent (8.5 Fr)	None	Complete drainage	No relapse after 11 months
4	Perirectal	Anterior resection for rectal cancer	42 × 32 mm	Transrectal stent (10 Fr)	Abdominal pain for 2 days	Complete drainage	No relapse after 11 months
5	Perirectal	Total hysterectomy for carcinoma of the cervix	26 × 24 mm	Aspiration only	None	Complete drainage	No relapse after 8 months
6	Perirectal	Anterior resection for rectal cancer	85 × 83 mm	Transrectal stents (8.5 and 10 Fr)	Fever for 24 hours	Incomplete drainage	Surgical drainage
7	Perirectal and perisigmoid	Sigmoiditis	70 × 53 mm	Transrectal stent (10 Fr)	Fever for 24 hours	Complete drainage	No relapse of the abscess; patient died of acute leukemia
8	Perirectal	Anterior resection for rectal cancer	42 × 34 mm	Transrectal stent (8.5 Fr)	None	Complete drainage	No relapse after 7 months
9	Perirectal	Anterior resection for rectal cancer	40 × 38 mm	Transrectal stent (8.5 Fr)	None	Complete drainage	No relapse after 5 months
10	Perirectal	Anterior resection for rectal cancer	45 × 40 mm	Transrectal stent (8.5 Fr)	None	Complete drainage	No relapse after 16 months
11	Perirectal	Anterior resection for rectal cancer	55 × 50 mm	Aspiration only	None	Incomplete drainage	Surgical drainage
12	Perirectal	Anterior resection for rectal cancer	40 × 35 mm	Transrectal stent (8.5 Fr)	None	Complete drainage	No relapse after 14 months

ies up to 10 Fr (Figure **1**). These EUS scopes were manufactured by Pentax-Hitachi (Hamburg, Germany) and were connected to the Hitachi ultrasound machine (525 or 6000). The treatment was performed under triple guidance, with ultrasound, endoscopic and radiological control.

The technique of EUS-guided drainage of perirectal abscess comprised the following steps:

1. The fluid collection and the area of contact between the rectal wall and the cyst wall were located.
2. Power Doppler assessment of the rectal wall was used to find an area in this contact zone with no blood vessels.
3. Under EUS-guidance a large 19-G needle (Wilson-Cook, Winston-Salem, North Carolina, USA) was used to puncture the cyst wall and collect fluid. Physiological saline solution was flushed into the cavity using a 10-ml syringe and re-aspirated to clean out the cavity as much as possible.
4. A needle knife was introduced through the working channel and used to puncture the abscess under EUS guidance (Figure **2a**).
5. The metal part of the needle knife was withdrawn, leaving the Teflon catheter in the fluid collection.
6. A 0.035-inch guide wire was inserted into the perirectal abscess cavity through the Teflon catheter.
7. The tract was dilated using an 8-mm balloon over the wire.
8. An 8.5- or a 10-Fr stent was positioned within the fluid collection over the wire in order to establish complete drainage of the abscess (Figures **2b**, **3**).

Informed consent was obtained from the patient before the procedure. The rectum and the colon were prepared using polyethylene glycol and enema. The drainage procedure was performed under general anesthesia, using propofol. Systemic antibiotic prophylaxis was given during the procedure, using amoxicillin plus clavulinic acid (2 g). The efficacy of the procedure evaluated by pelvic helical computed tomography (CT) and endorectal ultrasound. A helical CT scan was performed after one week (Figure **4**) and again 1, 6, and 12 months after the EUS-guided drainage, and endorectal ultrasound was performed every 4 months during 18 months of follow-up.

Results

No major complication occurred during this study. One patient developed abdominal pain after drainage but showed no radiological signs of perforation; pain disappeared 2 days later, after treatment with non-morphine drugs. Fever, which lasted for only 1 day, occurred in two patients. The fluid aspirate was sterile in four patients, contained Gram-negative bacteria (*Escherichia coli*) in five patients and Gram-positive bacteria (*Staphylococcus aureus*) in three patients.

Transrectal stent insertion into the abscess cavity was successful in nine patients: an 8.5-Fr straight prosthesis was inserted in five patients: a 10-F double pigtail stent was used in three patients; and in one patient who had a large perirectal abscess, two stents (8.5 Fr and 10 Fr) were used. In three patients stenting was impossible due to the distance between the abscess and the rectal wall (> 20 mm), and only the aspiration was performed. Of the nine patients in whom a stent was placed into the fluid collection, complete drainage without relapse was achieved in eight

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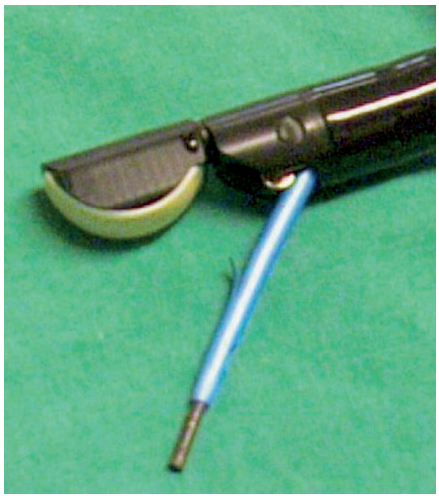

Figure 1 The Pentax-Hitachi EG 38UT interventional echo endoscope with a large working channel of 3.8 mm and an elevator.

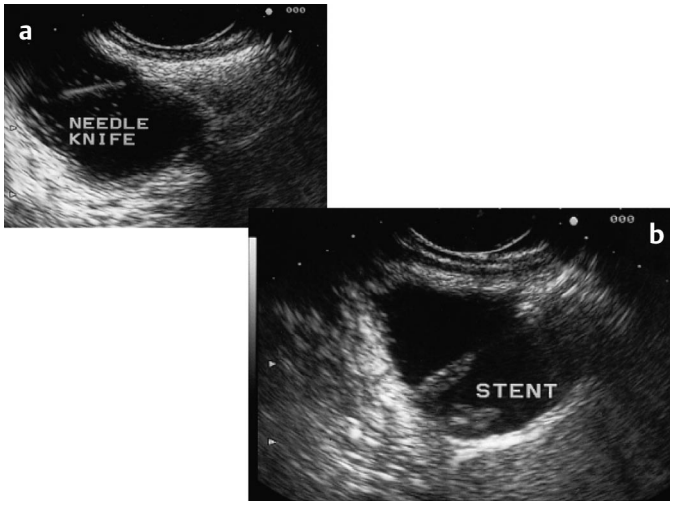

Figure 2 Endoscopic ultrasound (EUS) images of a pelvic fluid collection. **a** EUS-guided needleknife puncture of the cyst. **b** An 8.5-Fr transrectal stent in the cyst.

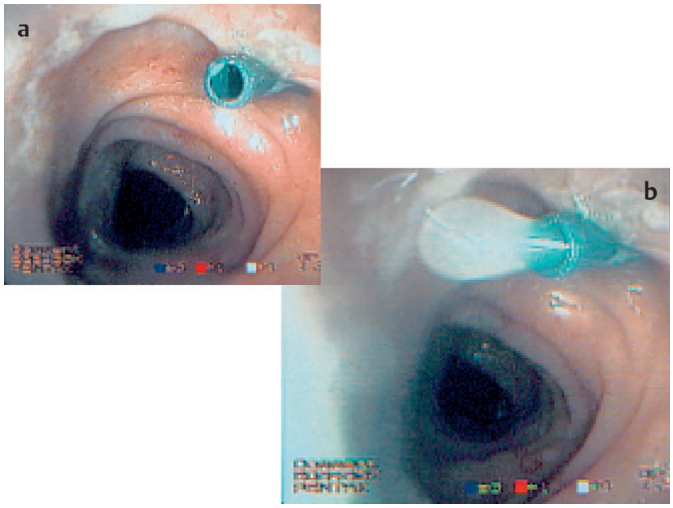

Figure 3 Endoscopic views: **a** A straight 10-Fr transrectal stent placed in a perirectal abscess. **b** Pus entering the rectum from the abscess.

Figure 4 Computed tomography views of a huge rectrorectal abscess. **a** before drainage and **b** 1 week after drainage using a 10-Fr stent.

patients (mean follow-up 10.6 months, range 6 – 14 months). The stent was removed endoscopically after 3 to 6 months (mean 4.3 months). Drainage was incomplete in one patient, who had a large abscess (> 8 cm diameter), and the patient underwent a surgical drainage procedure. In contrast, two of the three patients who were treated by aspiration alone developed a recurrence of their abscess and required surgical treatment.

Discussion

The use of endosonography is increasingly widespread for the treatment of pancreatic pseudocysts and pancreatic abscesses [7 – 10]. This technique allows the operator to locate areas of contact between the cyst and the wall of the digestive tract. This is especially important when the cyst does not cause extrinsic compression of the organ. The recent description of EUS-guided puncture using a curved-array transducer constitutes a first step towards interventional endosonography.

High success rates for ultrasound- or CT-guided drainage of perirectal or pelvic fluid collections have been reported in the literature. There have also been publications describing perirectal ab-

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scess drainage via the endorectal and endovaginal routes, but these studies have used rigid probes. The transvaginal route is ideally suited to pelvic abscess drainage because of the proximity of the vaginal fornices to most pelvic fluid collections. The transvaginal route has the big disadvantage, however, of being only semi-sterile. Because of the risk of introducing infection into previously uninfected pelvic pathological lesions, the transvaginal approach should only be used for biopsy of solid lesions or for draining cystic lesions that can be completely aspirated. Nelson et al. recently reported their experience in 15 women with a pelvic fluid collection [4]. This study assessed the feasibility of ultrasound-guided transrectal aspiration of gynecological pelvic abscesses in patients in whom intravenous antibiotic therapies had failed and whose abscesses were not suitable for colpotomy drainage or transabdominal or transvaginal ultrasound-guided aspiration. Purulent material was aspirated from the abscesses in 14 of the 15 women. These 14 women were all successfully treated with real-time ultrasound-guided transrectal drainage and only four required placement of an indwelling catheter.

Our study is original for two reasons. Firstly, we used EUS interventional and therapeutic scopes with large working channels (3.2 mm and 3.8 mm), the first reported use of such devices for this indication. Secondly we applied the same technique used for EUS-guided drainage of pancreatic pseudocysts of the drainage of perirectal fluid collections.

This study showed that it is possible to drain postoperative perirectal abscesses with EUS-guidance using 8.5-Fr or 10-Fr stents placed into the fluid collection through the rectal wall. Stenting is more accurate than simple aspiration of the fluid and we recommend that practitioners try to place a stent. Stenting is sometimes impossible, however, when the distance between the collection and the rectal wall is greater than 20 mm. The usefulness of this technique is also limited in the presence of very thick fluid or multiple cavities. It is important to carry out a helical CT scan before embarking on this procedure because poorly defined or multilocular fluid collections are not suitable for this nonsurgical method of drainage. EUS-guided perirectal abscess drainage must be performed only in patients with a unilocular cavity.

The formation of a pelvic abscess after pelvic surgery is a serious complication. EUS-guided transrectal drainage of deep pelvic abscesses is a safe and effective treatment for such fluid collections and presents an alternative so surgery. A fluid collection that CT demonstrates to be well defined is the principal indication for this new drainage technique.

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Abstract in French

But de l'Etude: Récemment l'échoendoscopie (EE) a été utilisée pour drainer des pseudokystes ou des abcès pancréatiques. Le but de ce travail a été d'utiliser l'EE comme moyen de drainage de collections pelviennes péri-rectales en général post-opératoire, en utilisant un échoendoscope interventionnel à gros canal opérateur. **Patients et Méthodes:** De septembre 2000 à juin 2001, 12 patients (9 hommes, 3 femmes) d'âge moyen 67 ans (extrêmes: 48 – 77 ans) ont présenté une collection abcédée pelvienne péri-rectale et ont eu une tentative de traitement guidée par EE. Il s'agissait 10 fois d'abcès rétro-rectaux après résection antérieure du rectum pour cancer, 1 fois d'une collection suppurée du cul de sac de Douglas après hystérectomie pour cancer du col de l'utérus, et 1 fois d'un abcès péri-sigmoïdien compliquant une sigmoïdité diverticulaire chez un patient présentant une leucémie aigue en phase d'induction thérapeutique (aplasie profonde). Le drainage de ces collections était realisé sous un triple contrôle-endoscopique, radiologique et échoendoscopique. L'appareil utilisée permettait l'utilisation de matériel de 8.5 F de diamètre. La technique consistait à repérer dans un premier temps la cavité abcédée et d'en réaliser la ponction avec une aiguille de 19 gauges permettant de recueillir du pus pour étude bacteriologique. Un lavage soigneux de la cavité par du sérum salé était alors réalisé jusqu'à obtention d'un liquide clair. Dans un second temps, une injection de contraste permettait de bien délimiter l'abcès. Celui-ci rempli de sérum physiologique était alors ponctionné avec un infundibutome de 5.5 F, permettant l'introduction d'un fil guide de 0.035 et la mise en place sur ce fil guide d'une prothèse de 8.5 F afin d'assurer un drainage endo-luminal. **Résultats:** Aucune complication n'est survenue, ni perforation, ni hémorragie. Une prothèse trans-rectale a pu être mise en place 9 fois sur 12 et dans 3 cas une simple aspiration-lavage a été réalisée. Parmi ces 3 cas, 2 ont récidivé très rapidement et ont du être réopérés. Parmi les 9 patients chez qui une prothèse trans-rectale avait pu être insérée, la collection suppurée a disparu complètement 8 fois sur 9. La prothèse trans-rectale a été laissé en place en moyenne 4.3 mois et a été retirée endoscopiquement sans complication. **Conclusion:** Il s'agit donc d'une technique prometteuse permettant d'éviter une deuxième intervention dans environ 80 % des cas.

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