Transvaginal Drainage of Pelvic Collections: a 5-year Retrospective Review in a Tertiary Gynaecology Centre

Dear Editor,

Imaging-guided aspiration and drainage is a feasible alternative to surgery in the treatment of pelvic collections.[1-10]

Traditionally, interventional radiologists access the pelvic collections via transabdominal, transgluteal and endorectal approaches. The transabdominal approach usually entails long distances to the pelvic lesions and risks transgression of intervening viscera. The transgluteal approach risks damaging the nerves and vessels, and is occasionally obstructed by the pelvic bones.[11] The endorectal approach is useful for accessing collections adjacent to the rectum[12] but it is non-sterile.

Transvaginal approach was initially described in the early 1990s.[7,11] The approach allows accurate, real time ultrasound-guided needle and drain placement, but has often been overlooked by interventional radiologists, owing to unfamiliarity and lack of data to guide case selection. The Royal College of Obstetricians and Gynaecologists (RCOG) noted that ultrasound-guided aspiration of pelvic fluid collections may be equally effective as surgery, and this has been incorporated into the United Kingdom national guideline for the management of pelvic inflammatory disease since June 2011.[12]

The aim of this study was to retrospectively review the indications, complications and success rates of transvaginal ultrasound-guided aspiration and catheter drainage of pelvic collections at our institution.

Materials and Methods

The hospital institutional review board approved this retrospective study and waived requirement for consent. The KK Women's and Children's Hospital's (KKH) radiology database from 2008 to 2012 identified 65 patients who underwent ultrasound-guided transvaginal drainage procedures. We defined pelvic collection as a cystic collection in the lower abdomen or pelvis that could not be safely or adequately treated with conventional percutaneous transabdominal drainage. Collections that were located caudal to the levator ani were excluded.

There are 2 interventional radiologists who routinely perform the transvaginal aspiration and drainage procedures at our institution. To facilitate the transvaginal ultrasound and visualisation of pelvic structures, patients were asked to empty their bladder prior to the procedure or had an in-and-out urinary bladder catheterisation. The patients were positioned in the lithotomy position and preliminary localisation with transabdominal and transvaginal scan were performed. Intravenous fentanyl and midazolam were administered for analgaesia and sedation. The perineum and vagina were prepared with 10% povidone iodine and chlorhexidine. Topical lignocaine (10%) spray was used to anaesthetise the cervix and vagina. The transvaginal probe was placed in the vaginal fornix and the needle route was scrutinised for bowels, bladder and vessels. Upon confirmation of the needle route, the probe was advanced to stretch the vagina over the transducer head, and a 17 to 18 gauge needle was advanced into the collection under direct ultrasound guidance. If a drain is indicated, a stiff 0.035 inch guidewire was inserted coaxially through the needle. The track was dilated and an 8 French pigtail drainage catheter was inserted. The drain was taped to the thigh and attached to a urinary collection bag or a vacuum bottle. In an aspiration-only procedure, the targeted fluid collection was syringed by hand till emptied. All fluid specimens were sent for microbiologic or cytological examination as indicated by the requesting clinicians. The catheter was removed once the output was less than 10 ml or at the clinical team's discretion.

The number of days patient stayed after the procedure were collated and analysed.

Statistical Analysis

Clinical success was defined as avoidance of surgery during the duration of the patient's admission. Complications were classified according to Society of Interventional Radiology (SIR) criteria.

Results

A total of 34 aspirations and 31 catheter drainage procedures were performed on 65 patients. The patients were women attending KKH hospital, ranging from 23 to 86 years old, with an average age of 45.9 years.

The indications for the procedures and success rates are summarised in Table 1. The clinical success rates are

Table 1. Indications for Aspiration and Drainage

Aetiology of Pelvic Collection	No. of Patients (n)	Percentage (%)	Aspiration	Drainage
Tuboovarian abscess	23	35	11	12
Pelvic collections	30	46	14	16
Endometriotic cysts	6	9	4	2
Symptomatic ovarian cysts	4	6	4	0
Haematocolpos	1	2	0	1
Haematometra	1	2	1	0
Total	65	100	34	31

summarised in Table 2. An example of ultrasound-guided transvaginal drainage is illustrated in Figure 1.

The patient with haematocolpos due to uterine diadelphys was excluded as surgery was preplanned and aspiration was for temporary relief of symptoms. The overall success rate for avoiding surgery during the duration of the patient's admission was 88% (56 of 64 patients), including 83% (19 of 23 patients) with tuboovarian abscesses refractory to medical therapy.

In total, there were 13% (9 of 65) of patients who needed surgery, including 4 cases of unremitting tuboovarian abscesses, 1 case of mixed ovarian tumour, 1 case of serous cystadenoma, 1 case of unremitting pyometria, 1 case of endometriosis and 1 case of haematocolpos.

One patient developed a minor complication according to SIR criteria, requiring nominal therapy without significant long term consequence. The patient underwent a combined transvaginal and transabdominal drainage for tuboovarian abscesses, with the transabdominal approach resulting in an abdominal wall haematoma. The patient was treated with manual compression and was well enough for discharge the following day.

There were 2 mortalities within the study group during the course of hospital admission. The mortalities were due to complications of advanced pelvic malignancy and were unrelated to the interventional drainage procedures. One patient suffered asystolic collapse secondary to overwhelming sepsis. The second patient succumbed to intestinal obstruction from peritoneal metastases. Both patients underwent transvaginal drainage for symptomatic relief of large pelvic cystic collections related to pre-existing pelvic malignancies.

Thirty-seven percent of the patients were discharged on the same day and 66% were discharged up to 2 days post-aspiration, demonstrating good patient tolerability of the transvaginal procedure.

Discussion

Standard treatment of pelvic fluid collection refractory to medical therapy has been laparotomy or laparoscopy. Image-guided drainage procedure obviates general anaesthesia, surgical wounds and associated surgical morbidity. Ultrasound-guided drainages are feasible due to advances in ultrasound technologies and refinement in techniques.[5-8]

The pelvic collections group comprises the largest group of patients in our study. This group is heterogeneous comprising postsurgical collections, infected pelvic collections, malignant pelvic collections and other cystic pelvic lesions. Transvaginal ultrasound-guided aspiration or drainage had therapeutic role in selected benign or postsurgical pelvic collection and was a valuable adjunct to surgery.

Table 2. Clinical Success Rates

Aetiology of Pelvic Collection	No. of Cases (n)	Surgery	No Surgery	Success
Tuboovarian abscess	23	4	19	83%
Pelvic collections	30	4	27	90%
Endometriotic cysts	6	0	6	100%
Symptomatic ovarian cysts	4	0	4	100%
Haematocolpos	1	1	0	0%
Haematometra	1	0	1	100%
Total	65	9	56	86%
Adjusted Total*	64	8	56	88%

*After exclusion of haematocolpos due to uterus didelphys.

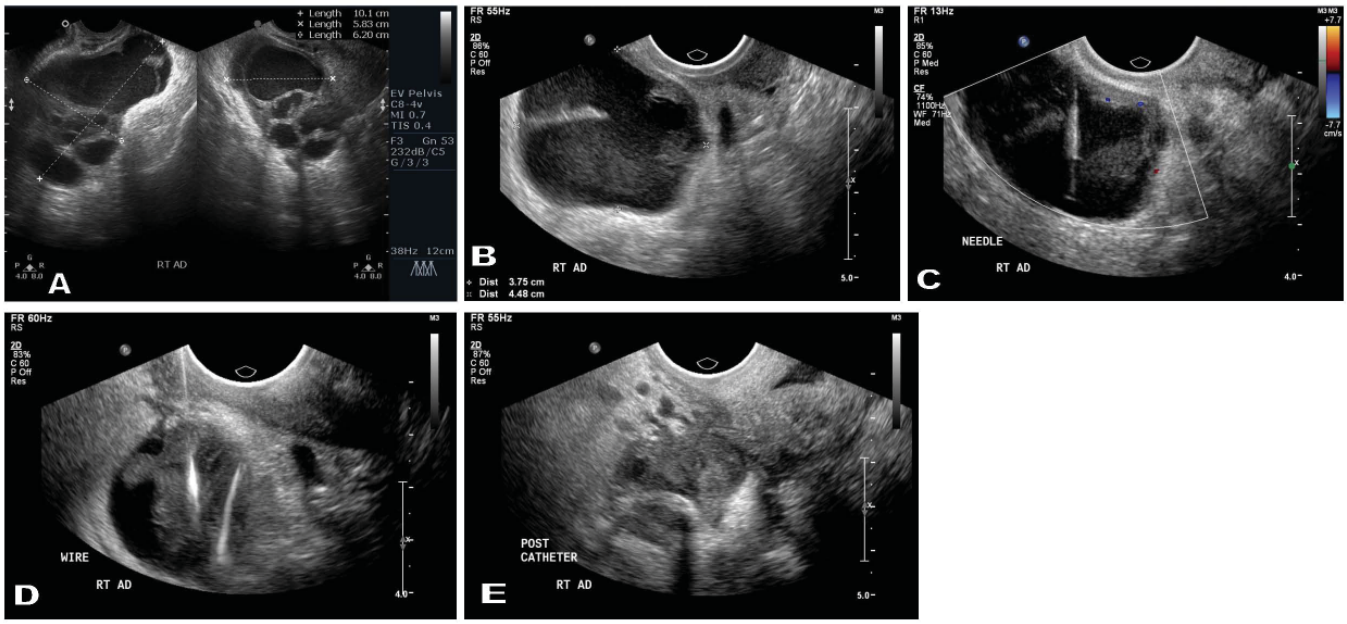

Fig. 1. Right tuboovarian abscess in a 29-year-old woman with pelvic inflammatory disease, presenting with fever and lower abdominal pain. (A) Ultrasound pelvis shows a 10.1 x 5.8 x 6.2 cm multiloculated cystic mass in the right adnexa containing internal echoes and prominent vascularity in its internal septations, consistent with a tuboovarian complex. Patient underwent transvaginal ultrasound guided drainage 2 days after initial ultrasound. (B,C,D) The transvaginal probe, equiped with a needle adapter, was inserted into the vagina. Under direct ultrasound guidance, a 18G needle was advanced into the right adnexal cystic lesion via the needle adapter. A 0.035 guidewire was then advanced into the collection. (D) A 8F drainage catheter was then inserted over the guidewire with pigtail deployed into the collection. The catheter was then connected to a vacuum drainage bottle and secured with adhesive dressing to the thigh. (E) A post-drainage ultrasound image with the catheter in situ.

In our study, tuboovarian abscesses refractory to medical therapy is the second largest group of patients. Transvaginal ultrasound-guided aspiration or drainage was frequently feasible with minimal risk. Ultrasound-guided drainage of tuboovarian abscesses helped majority of our study group patients avoid surgery.

Transvaginal ultrasound-guided aspiration of symptomatic ovarian cysts led to symptom improvement for all patients. Although there are concerns raised about missed malignancy[13,14] and the possibility of recurrence, the clinical efficacy, low morbidity and low risks associated with transvaginal ultrasound-guided drainage makes it a reasonable alternative to surgery in carefully selected patients.

Conclusion

In our study, transvaginal ultrasound-guided drainage is efficacious and demonstrates high clinical success rate. The clinical success rate for tuboovarian abscesses, pelvic collections and overall pelvic collections were 83%, 90% and 88%, respectively. Transvaginal approach to drainage of pelvic collections is a useful technique to add to the repertoire of the interventional radiologist, and can help patients with deep pelvic collections circumvent the need for general anaesthesia, open surgery and risks of surgical complications.

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