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Transvaginal Aspiration of Ovarian Cysts: Long-Term Follow-up

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Abstract

Background and purpose: Transvaginal aspiration of ovarian cysts has been advocated as a viable alternative to surgery in patients who are high-risk surgical candidates. We describe a retrospective study evaluating the results of transvaginal aspirations of benign ovarian cysts in patients at increased surgical risk, focusing on long-term follow-up for recurrence of the cyst and/or development of malignancy.

Methods: Twenty-four women with ovarian cysts underwent 34 transvaginal drainages between October 1998 and December 2004. All patients were referred following diagnosis of a persistent ovarian cyst with a benign appearance on ultrasound. All patients were unsuitable candidates for surgery (history of previous pelvic surgery, $n = 21$; high risk for anesthesia, $n = 1$; and unsuitable for laparoscopy due to obesity, $n = 2$). Patients with a history of pregnancy, acute abdominal symptoms, or previous gynecologic malignancy were excluded. A 20G × 20 cm Chiba needle was used for transvaginal aspiration using an endocavity probe (Acuson XP, Mountain View, CA, USA; Siemens Sololine, Erlangen, Germany) and intravenous sedoanalgesia. Cysts were aspirated to dryness.

Results: Long-term follow-up of patients was performed and revealed a recurrence rate of 75%. Eighty-three percent of cysts on the left and 42% of those on the right recurred. Nine of 15 (60%) patients with recurrence required further intervention. Two of 9 underwent surgical intervention only, 4 of 9 had repeat transvaginal aspiration(s) performed, and 3 of 9 had a combination of both transvaginal aspiration and surgery. No patient developed ovarian malignancy.

Conclusion: Transvaginal cyst aspiration has many advantages including short hospital stay, rapid recovery, excellent patient tolerance, and a low rate of procedure-related complications. Our study demonstrates that ovarian cyst recurrence following transvaginal drainage is a more significant problem than previously documented, especially if the cyst is on the left side. However, when recurrences do occur, repeat transvaginal aspirations may be considered in the symptomatic patient.

Key words: Aspiration—Ovarian cyst

With the widespread use of improved ultrasound technology the rate of diagnosis of ovarian cysts has increased exponentially. In 1989 a study of 5000 healthy women reported that 6% had adnexal masses of which 90% were cystic tumors [1]. Indeed, ovarian cysts were the fourth most common gynecologic cause of hospital admission in the United States in the late 1980s [2].

Many studies have shown that the vast majority of ovarian cysts diagnosed are benign or functional [3, 4]. Despite clinical experience suggesting that simple cystic masses do not become malignant, their malignant potential remains a subject for debate [5–7]. Given this uncertainty the identification of an ovarian cyst continues to cause considerable anxiety for women and in the presence of symptoms they are difficult to ignore. The surgical management, including laparoscopy, of probable benign disease may represent over-treatment with considerable cost to both the patient and society.

A number of studies have advocated transvaginal aspiration of ovarian cysts as a viable alternative to surgical intervention in patients who are high-risk surgical candidates [8, 9]. The main opponents of this technique highlight the potential difficulties in relation to the diagnosis of malignancy, risk of preoperative spill of malignant cells, and high rates of cyst recurrence after aspiration.

We describe a retrospective study evaluating the results of transvaginal aspirations of benign ovarian cysts in patients at increased surgical risk, focusing on the long-term follow-up for recurrence of the cyst and/or development of malignancy.

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Materials and Methods

In our institution ethics committee approval is not routinely required for studies employing retrospective analysis. Twenty-four women with ovarian cysts underwent 34 transvaginal drainages between October 1998 and December 2004.

Patient Selection

All patients were referred following diagnosis of a persistent ovarian cyst with a benign appearance on transvaginal ultrasound examination. Transvaginal ultrasound was performed using a multifrequency endovaginal transducer (Acuson XP, Mountain View, CA, USA; Siemens Sonoline, Erlangen, Germany). The patient's gynecologic history, including their menopausal status was noted. (There is a recognized increased likelihood of malignancy in postmenopausal patients [10]). Fourteen patients were premenopausal, 9 patients were postmenopausal, and 1 patient had a surgically induced menopause secondary to a previous bilateral salpingo-oophorectomy.

Transvaginal drainage was only considered if the cysts met the criteria for benignity on the basis of sonographic architectural features as well as color and Doppler flow characteristics. Features suggesting benignity included completely cystic lesions with no internal echoes or with smooth, thin (<3 mm) septations and lack of focal hypervascularity on Doppler ultrasound ($n = 22$). Cystic lesions with low-level echoes consistent with a hemorrhagic cyst or an endometrioma in patients with a confirmed diagnosis of endometriosis were also included ($n = 2$). Cysts that demonstrated mural irregularity, especially when associated with focal high-velocity or low-impedance flow on Doppler investigation, were excluded from the study. Cysts demonstrating features suggestive of dermoid cysts (fat–fluid levels, globular calcifications or hyperechoic mural plug) were also excluded.

The mean age of the patients was 45 years (range 21–85) years. There were 12 right ovarian cysts and 12 left ovarian cysts. All patients were considered unsuitable candidates for surgery. Twenty-one patients had a history of previous pelvic surgery, 1 patient was a high risk for anesthesia, and 2 patients were unsuitable for laparoscopy due to obesity. Patients with a history of pregnancy, acute abdominal symptoms, or previous gynecologic malignancy were excluded.

Procedure Protocol

All patients were admitted to a ''day-ward'' on the morning of the procedure. The patient's symptoms, allergies, medication, and previous interventions were recorded. Following informed consent, intravenous access was established and the patient transferred to the interventional ultrasound suite. The presence and characteristics of all cysts were assessed with transvaginal sonography prior to drainage and only cysts consistent with benign lesions were considered for aspiration.

Intravenous sedation and analgesia using midazolam (1–2 mg) and fentanyl (50–100 μg) was routinely administered. Prophylactic antibiotics and local anesthetic were not used (the vaginal wall is documented to be insensitive to needle puncture). Using an aseptic technique the perineum and vagina were prepared and draped in the usual sterile manner. The probe was sterilized and covered with a condom. A sterilized biopsy guide holding a 20G × 20 cm Chiba needle was mounted onto the transducer. Using direct ultrasound guidance the needle was aimed at the center of the cyst and the cyst was aspirated to complete dryness where possible.

The amount of fluid drained and its macroscopic appearance was recorded at the time of the procedure and the aspirate was routinely sent for cytologic analysis. All patients were reviewed by a radiologist prior to discharge from hospital and any complications were noted.

A follow-up ultrasound examination and an appointment with the referring clinician were organized with the patient prior to discharge.

Table 1. Previous surgery

Gynecological surgery only	8
Total abdominal hysterectomy	5
Vaginal hysterectomy	1
Laparoscopy and cyst drainage	2
Gastrointestinal surgery only	4
Bowel resection	3
Hernia repair	1
Gynecological and gastrointestinal surgery	9
Total abdominal hysterectomy/bowel resection	2
Total abdominal hysterectomy/hernia repair	2
Total abdominal hysterectomy/appendicectomy	2
Cyst drainage/appendicectomy	3
No surgery	3

Table 2. Concurrent medical history

Ischemic heart disease/hypertension	4
Diabetes mellitus	1
Multiple sclerosis	1
Inflammatory bowel disease	5
End-stage renal failure	1

Data Collection

The result of cytologic analysis, recurrence rates, need for repeat procedures or subsequent surgical intervention, and development of malignancy were documented by reviewing medical notes as well as radiology and pathology records. Patients lost to clinical follow-up were contacted by telephone.

Results

Twenty-four patients underwent 34 transvaginal drainage procedures during the study period. Initial clinical presentations included abdominal pain ($n = 16$), incidental finding ($n = 2$), abdominal swelling ($n = 1$), and unrecorded ($n = 5$). A summary of the patients' previous surgery is shown in Table 1. It is worth noting that 5 patients had previous surgery for ovarian cysts. Twelve patients had significant concurrent medical problems, listed in Table 2. All patients had been deemed suboptimal candidates for laparoscopy and it was hoped that successful transvaginal drainage would obviate the need for surgical intervention. Four patients had documented evidence of endometriosis prior to transvaginal aspiration while 1 patient had a family

history of ovarian carcinoma. No patient had a history of previous gynecologic malignancy.

The mean diameter of the cysts was 7.7 cm with a range of 5–10 cm. The initial transvaginal drainage was technically successful in all patients. The average amount of fluid drained was 143.1 ml with a range of 10–400 ml. The fluid was clear or straw-colored in 22 patients and hemorrhagic in 2 patients (1 with a history of endometriosis). The aspirated fluid was routinely sent for cytologic analysis and there was no evidence of malignancy in any of the aspirates.

Overall the procedure was well tolerated by patients and no major complications were recorded. One patient complained that she found the procedure ''embarrassing'' and 1 patient noted some per-vaginal ''spotting'' after procedure, but this resolved spontaneously prior to discharge from hospital. No other immediate complications were noted and review of the medical notes did not reveal any late complications.

Follow-up

The average length of follow-up was 39.5 months with a range of 1–85 months.

Fifteen patients attended for follow-up radiological imaging. Imaging demonstrated ovarian cysts in 13 of 15 patients. In 12 patients the cyst was on the same side as the original cyst. Among these 12 patients the size of the cyst was the same size as the original cyst in 7 patients, smaller in 3 patients, and larger in 2 patients.

Two patients were reviewed by a gynecologist 4–6 weeks after transvaginal aspiration. Both patients developed recurrent symptoms and proceeded to surgical removal of recurrent cysts 4 and 5 months post-procedure. These cysts were benign on histologic investigation and neither patient required further intervention.

Seven patients did not return for clinical follow-up. Three patients were contacted by telephone and all 3 were asymptomatic at the time of review. Four patients could not be contacted and were excluded from the calculations.

In total 15 of 20 patients (75%) had recurrence of their cysts after transvaginal aspiration. Two patients underwent surgical removal of recurrent ovarian cysts, 7 patients had repeat transvaginal aspiration, and the remainder of the patients were treated conservatively. Four of the 7 patients who underwent repeat transvaginal aspiration developed recurrence and 3 of these proceeded to surgical cystectomy. In total 5 patients underwent surgical cyst removal during the study period.

We compared the characteristics of those patients with recurrence to those without recurrence. The mean diameter of the cyst was 5.3 cm in those patients with recurrence and 6.3 cm in those patients without recurrence, with no significance difference between the two groups ($p = 0.949$). Ten of the recurrent cysts were on the left side while 5 were on the right. Therefore 83% (10 of 12) of cysts on the left and 42% (5 of 12) of those on the right recurred. All 4 patients with a preprocedural history of endometriosis had evidence of recurrence. Nine of 15 (60%) patients with recurrence required further intervention. Two of 9 underwent surgical intervention only, 4 of 9 had repeat transvaginal aspiration(s) performed, while 3 of 9 had a combination of both transvaginal aspiration and surgery. In total, 5 patients (21%) underwent surgery for cyst removal during the study period. None of the cysts removed surgically showed evidence of malignancy.

Discussion

The increasing use of sonography has resulted in a dramatic increase in the rate of diagnosis of ovarian cysts. The appropriate treatment of these ovarian cysts remains the subject of much debate [11]. Zanetta et al. found that spontaneous resolution of ovarian cysts occurred in 44.6% of patients treated conservatively [12]. In addition, despite continued debate, research does not support the potential malignant change of benign ovarian cysts, lending further support to the option of conservative management [4, 13]. Conservative management, however, is a source of anxiety for patients and clinicians. On the contrary, surgical intervention for benign disease places an unnecessary strain on resources. In a retrospective study performed in the early 1980s, functional cyst was the ultimate diagnosis in 66% of all ovarian ''tumors'' requiring surgery [14].

Laparoscopy is long established as an alternative to laparotomy for benign adnexal masses; however, it too involves anesthesia and hospital admission [15]. Over the past decade transvaginal aspiration of ovarian cysts under conscious sedation has emerged as a safe alternative to surgery [8, 9] with potential reductions in cost, morbidity, and mortality. In our study surgical intervention was successfully avoided in 19 of 24 patients with a significant cost benefit.

The success of transvaginal cyst aspiration is dependent upon careful patient selection. It is imperative that malignancy is excluded prior to the procedure as preoperative spill of an unsuspected ovarian neoplasm may have a negative effect on survival [16–18]. De la Cruesta et al. in their study of patients with malignant ovarian epithelial neoplasms demonstrated a recurrence/death rate of 3% in patients with stage 1a tumors compared with a rate of 20% in patients who had stage 1c disease secondary to intraoperative rupture. In addition, they demonstrated no significance difference in survival between patients with stage 1c disease secondary to intraoperative rupture and patients with stage 1c disease secondary to capsular invasion, serosal disease or positive ascites/washings [16]. Similarly, Malkasian et al. in their review of 1938 patients with epithelial ovarian cancer demonstrated that stage Ia patients had a significantly better prognosis than all other stage I patients [19].

Studies have shown that transabdominal sonography of ovarian tumors has a predictive value of 73% for malignancy and 95.6% for benign disease [14, 20–22]. In addition

the risk of a simple, sonographically benign ovarian cyst being malignant is 0.3% [23]. In our study we combined the patient's clinical symptoms with the morphologic and vascular characteristics of the cyst on transvaginal sonography. This technique has been shown to have a specificity of 97% and a sensitivity of 97% in differentiating malignant from benign disease [24].

We routinely sent all aspirations for cytologic analysis and no malignant cells were identified in any patient. The predictive value of cytology is poor, with a reported specificity of 100% for diagnosis of malignant disease but a sensitivity of only 75% [25–27]. Therefore, cytologic analysis alone to exclude malignancy is inadequate and it must be used in combination with sonographic analysis. None of our patients developed gynecologic malignancy during our study period (mean length of follow-up was 39.5 months).

Transvaginal aspiration of ovarian cysts was well tolerated by all our patients with no major complications identified. Similar results have been documented elsewhere [12, 27]. The routine use of careful examination of the needle route by Doppler imaging to eliminate unnecessary trauma to surrounding blood vessels and ensure an uncomplicated procedure is supported by a number of authors [27, 28]. In our study we did not routinely use Doppler sonography for needle placement and no major complications were recorded.

Our study shows an overall recurrence rate for ovarian cysts after transvaginal drainage of 75%. This represents a higher level of recurrence than many previous studies. Our mean length of follow-up was 39.5 months with a range of 1–85 months. This is significantly longer when compared with other studies. Lee et al., Troiano et al., and Bonilla-Musoles et al. reported recurrence rates of 11.1%, 27.5%, and 25% respectively, but their maximum length of follow-up was 24 months [8, 9, 26]. These findings would imply that patients with a predisposition for ovarian cysts are likely to develop recurrence and the likelihood of detecting this recurrence increases with time. It is interesting to note that only 9 of the 15 patients with recurrence underwent further intervention despite the recurrent cyst being larger than the original in some cases. This observation is difficult to explain; however, one could postulate that the transvaginal ultrasound, aspiration, and cytologic analysis may have provided reassurance to both the patient and their clinician.

Weinraub et al. cited the importance of three parameters in predicting recurrence of ovarian cysts, namely the age of the woman, maximum diameter of the cyst, and whether the cyst was right- or left-sided [27]. In our study we saw no significant difference between those patients with recurrence and those without recurrence with regard to the maximum diameter of the cyst ($p = 0.949$). However, 83% of cysts on the left side recurred compared with 42% of right-sided cysts. Weinraub et al. suggested that the difference in venous drainage between right and left may explain this finding as the left ovarian venous system drains to the renal vein while the right side drains directly to the inferior vena cava [27].

Conclusion

Our study highlights the advantages of sonographically guided transvaginal cyst aspiration, which include short hospital stay, rapid recovery, excellent patient tolerance, and a low rate of procedure-related complications. This simple and safe procedure may be used as an alternative for patients unfit for surgical intervention. In addition, the procedure provides information to both patient and clinician in the form of close sonographic assessment and cytologic analysis of the lesion. This information may be used to reduce fears of ovarian malignancy. Of note, our study demonstrates that ovarian cyst recurrence following transvaginal drainage is a more significant problem than previously documented, especially if the cyst is on the left side. However, when recurrences do occur, repeat transvaginal aspirations are possible and may be considered in the symptomatic patient.

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