

Ultrasound-Guided Transvaginal Cyst Aspiration for the Management of Pelvic Pseudocyst: A Preliminary Experience

Ching-Chou Tsai, MD; Chung-Chang Shen, MD; Chan-Chao Changchien, MD;
Te-Yao Hsu, MD; Fu-Tsai Kung, MD; Shiuh-Young Chang, MD;
Ming-Yang Chang¹, MD; Fu-Jen Huang, MD

Background: While some research has been reported on the use of transvaginal ultrasound-guided aspiration of ovarian cysts, none has been reported for pseudocysts. Sometimes laparotomy patients experience recurrent pelvic pseudocysts for which they may need to undergo another laparotomy. The use of transvaginal ultrasound-guided aspiration of pelvic pseudocysts may make repeated laparotomies unnecessary.

Methods: Between April 1993 and October 2001, 14 outpatients with postoperative pelvic pseudocysts underwent transvaginal ultrasound-guided aspirations with or without surgical starch irrigation. All patients had previously undergone pelvic surgeries for adenomyosis and leiomyoma, except one was stage Ib cervical cancer. A total of 25 treatment cycles by transvaginal ultrasound-guided aspiration were included: 15 cycles with starch and 10 cycles without.

Results: The 13 patients with more than 6 months follow-up had a total of 25 aspiration cycles, 22 of which (88%) had no recurrent cyst by the end of their 6-month follow-up period. Eighteen out of 25 cycles (72%) had no evidence of recurrence after 12 months of follow-up. Five patients needed only one aspiration to become disease free and six patients needed two aspirations. Only 2 patients needed 3 or more aspirations procedures. After 12 months of follow up, 33% of those irrigated with starch had a recurrent pelvic pseudocyst while 30% without starch experienced recurrence.

Conclusion: Because it eliminates necessity of repeat laparotomy, transvaginal ultrasound-guided aspiration of pelvic pseudocysts may become a preferred treatment for recurrent pelvic pseudocysts.
(*Chang Gung Med J* 2002;25:751-7)

Key words: pelvic pseudocyst, cyst aspiration.

Pelvic surgery can cause adhesions that may lead to pelvic inclusion cysts, also known as pelvic inflammation cysts. Such cysts may not be severe

complications of pelvic surgery, but can cause abdominal fullness and post-operative abdominal pain. It has been suggested that fluids become

From the Department of Obstetrics and Gynecology, Chang Gung Memorial Hospital, Kaohsiung; ¹Department of Obstetrics and Gynecology, Chang Gung Memorial Hospital, Taipei.

Received: Apr. 19, 2002; Accepted: Jul. 31, 2002

Address for reprints: Dr. Fu-Jen Huang, Department of Obstetrics and Gynecology, Chang Gung Memorial Hospital, 123, Ta-Pei Road, Niasung, Kaohsiung, Taiwan, R.O.C. Tel: 886-7-7317123 Ext. 8915; Fax: 886-7-7322915; Email address: huangfj@seed.net.tw

entrapped in the post-operation adhesions, forming a "pseudocyst."⁽¹⁾ Most gynecologists will either aspirate the cyst or perform a laparotomy. Needle aspiration is a viable alternative, as it may prevent repeated laparotomies. In addition to the possibility of repeated surgeries or aspirations, high recurrence rates are not uncommon.⁽²⁾ Ultrasound-guided aspiration, which can be done in an outpatient setting, can reduce hospital stays. Sclerosing agents such as absolute alcohol,⁽³⁾ povidone iodine, and tetracycline,⁽⁴⁻⁶⁾ have been successfully used in treating hepatic cysts, lymphocysts, and pleural effusions. Starch-coated surgical gloves are thought to be non-irritating in certain circumstances, such as pelvic reconstructive surgery.^(7,8) Starch sclerosis for treatment in transvaginal ultrasound-guided aspiration has been reported in 2 cases.⁽⁹⁾ To date, the effect of transvaginal ultrasound-guided aspiration on pelvic pseudocysts has not been fully evaluated. In this study, the transvaginal ultrasound-guided aspiration of pelvic cysts in 13 patients with or without starch, and with follow-up over 5 to 10 years, was performed to evaluate the diagnostic, therapeutic, and curative effects of this procedure.

METHODS

Between 1993 and 2001, fourteen patients with pelvic pseudocysts underwent transvaginal ultrasound-guided aspiration at Kaohsiung Chang Gung Memorial Hospital. All patients had received pelvic surgery for conditions including adenomyosis and leiomyoma, and all of the removed tumors had proven to be benign, except for one, which was categorized as stage Ib cervical cancer. That patient underwent a radical abdominal hysterectomy. Four cases received a laparotomy for the removal of ovarian cysts, and pelvic inclusion cysts were an incidental finding (Table 1). The other 10 cases with the clinical symptoms of lower abdominal pain or lower abdominal fullness underwent ultrasound-guided aspiration at our hospital. The patients ranged between 32 and 49 years of age, and all but one patient had completed childbearing (Table 1). All patients were examined with a 5MHz Aloka SSD-2000 transvaginal probe. Ultrasonography identified unilocular cysts in all 14 patients. Sixteen gauge, 35 cm COOK IVF needles (K-OPSD-1635) were used in conjunction with a 20 ml syringe. The needle was

Table 1. Pretreatment Characteristics of Patients with Pelvic Pseudocyst

Case	Age/Parity	Prior gynecological disease	Prior gynecological surgery
1	34/G4P3	Adenomyosis	TAH, USO
2	42/G0	Menorrhagia	TAH
3	39/G4P2	Myoma	TAH, USO
4	32/G5P3	Left ovarian cyst	USO
5	38/G3P2	Menorrhagia	TAH
6	40/G4P3	Myoma	TAH
7	33/G4P2	Recurrent endometriosis	TAH, USO
8	39/G3P2	CIS	TAH
9	38/G4P3	Cx cancer Ib	RAH
10	36/G5P2	Adenomyosis	TAH
11	36/G4P3	Adenomyosis	TAH
12	39/G2P2	Menorrhagia	TAH, USO
13	32/G1A1	Adenomyosis	TAH
14	49/G4P4	Myoma	LH

Abbreviations: TAH: total abdominal hysterectomy; CIS: cervical carcinoma in situ; LH: laparoscopic hysterectomy; RAH: radical abdominal hysterectomy; USO: unilateral salpingoophorectomy.

inserted through the needle guide for aspiration. All aspiration fluid samples were sent for cytology, and all were found negative for malignancy. After needle aspiration, starch mixed with normal saline was injected 3 to 5 times into the cyst that had been aspirated. All patients underwent regular follow-up at the hospital. Complete disappearance of the cyst on the ultrasound scanner was defined as no evidence of disease. At the end of 6 months of follow-up, patients who had a cystic finding in the same place as the initial sonographical finding were considered to have a recurrence.⁽¹⁾

RESULTS

In one case the interval between the last aspiration and the deadline of the study was less than 6 months; data from that case was not included in our statistical analysis. Thirteen patients in this study had more than 1 year of follow-up after the last aspiration. In 5 of the 13 (38.46%) patients, only 1 cycle of aspiration was needed, with no further evidence of disease. In the remaining 8 patients, there was no evidence of disease after more than one cycle of

aspiration. Six (75%) of the 8 patients had no evidence of recurrence after no more than 2 cycles of aspiration, and were found to be disease-free (Table 2).

The volume of fluid aspirated from the cysts ranged between 25 and 1100 ml. The sizes of the 3 cysts removed by laparotomy are recorded in Table 2. In those patients who were disease free after only one aspiration procedure, the mean volume of the aspirate was 133.6 ml. Five patients were disease-free after 2 aspiration procedures. In these, the mean volume of the first aspiration was 379.2 ml; the second, 280 ml. Two patients needed more than 2 aspiration procedures each; the mean volume of the first aspiration was 299.5 ml; the second, 375 ml. The volume aspirated from the pelvic inclusion cyst decreased each time, except in 3 patients (Table 2).

The mean value for the interval between the original gynecological surgery and the initial diagnosis of pelvic cysts was 26 months, with the follow-up lasting from 1 to 39 months. For patients in whom no evidence of a recurring cyst was later found, the interval was 50.38 months. Three out of the 13 patients in this study had symptoms such as abdominal fullness or abdominal pain required an additional procedure to treat the cyst before the end of the 6 or 12-month period. One patient arrived in our emergency room with abdominal pain only one month post aspiration, and a pelvic pseudocyst was discovered in the previous location. The pseudocyst was aspirated, yielding 140 ml of fluid. The next aspiration took place 6 months later, during regular follow up, and 250 ml was aspirated without serious symptoms.

Thirteen patients had 25 cycles of aspiration in this study, and 22 out of the 25 (88%) had no recurrent cyst at the end of 6 months of follow-up. Eighteen out of 25 cycles (72%) had no evidence of recurrence after 12 months of follow-up. Additionally, 11 of the 25 cycles had no evidence of disease after 2 years of follow-up. Four patients underwent laparotomies to treat the cysts, 2 out of the 4 (50%) having undergone aspirations 4 times (Table 2).

In the ultrasound-guided aspiration group, 9 patients were irrigated with starch after aspiration of the cysts. At the end of 6 months of follow-up, 5 of the 9 patients showed no further evidence of disease

Table 2. Treatment Course of Patients with a Pseudocyst

Case	Hx of laparotomy for pseudocyst	Volume of aspiration (ml)				NED (month)
		1st	2nd	3rd	4th	
1	+	60*				48
2		283				60
3		210*				44
4		25*				47
5		90				75
6		400	800*			77
7		300*	60*			95
8	+	150*	100*			59
9		25*	25*			34
10		1000	255			24
11	+	459*	500*	1100*	170*	25
12	+	140	250	350	58	61
13		400	440*			6
14		89*				3

Abbreviations: NED: no evidence of disease

*: Starch irrigation following ultrasound-guided aspiration of the pseudocyst

after only one cycle of aspiration combined with surgical starch irrigation. The other patients who had recurrent disease, and who were not free of symptoms for more than 6 months, were given a second cycle of treatment. After 6 months of follow-up, 3 patients had no evidence of disease. Only 1 patient required more than two aspiration procedures.

The follow up of the patients aspirated with starch ranged from 3 to 77 months, with a mean of 32.8 months. The follow up of patients aspirated without starch ranged from 1 to 75 months, with a mean of 36.4 months. After 6 months of follow-up, 3 out of 15 (20%) cycles with starch had recurrent pelvic pseudocysts. Only 1 of 10 (10%) cycles without starch had a recurrent pelvic pseudocyst. After 12 months follow up, 5 out of 15 (33.3%) cycles with starch experienced recurrent pelvic pseudocysts, and 3 out of 10 (30%) without starch experienced recurrent pelvic pseudocysts.

The mean time interval between one aspiration of pelvic pseudocysts and recurrence was 30.8 months, with or without starch. For a second aspiration, mean interval to recurrence was 38.3 months, for a third, 28.5 months, and a fourth, 43 months.

DISCUSSION

With the introduction of vaginal sonography, ultrasound-guided puncture of gynecological tumors has proven to be a safe, reliable, and increasingly popular method for obtaining a pathological tumor diagnosis. It can be applied to cystic tumor sampling in the lower pelvis as well.⁽¹⁰⁾ The ultrasound-guided technique for puncturing follicles has become even simpler than the abdominal transvesical technique.⁽¹¹⁾ The predictability for benign neoplasms, when a clear unilocular cyst is diagnosed by ultrasound, is in the range of 90-95%.⁽¹²⁾ The predictive value of abdominal sonographic evidence of malignancy, based on previous reports, ranges between 73% and 95%.^(8,13-15) Accuracy rates have increased since transvaginal sonography has been used in the diagnosis of ovarian tumors. Nevertheless, follow-up examinations are still recommended, owing to the slight possibility of a false negative diagnosis.⁽⁸⁾ Close sonographic follow-up is necessary because the presence of cells with a benign epithelial character does not exclude the possibility of malignant components in other regions of the sampled tumor.⁽⁴⁾ It is important for all patients to undergo careful ultrasound examination using high-resolution equipment before cyst puncture, preferably using transvaginal ultrasound, so that optimal views can be obtained.⁽¹⁶⁾ The probability of malignancy in a unilocular tumor less than 10 cm in diameter and without papillary formation is low, regardless of age of the patient.⁽¹²⁾ In this study, all patients had undergone hysterectomies and had pathologically proven benign gynecological disease, except for one patient with stage Ib cervical cancer. None of the patients had an adnexal malignancy, and the pelvic inclusion cyst aspirate was sent out for cytology after each aspiration. The great variety of ovarian tumor types makes the cytological interpretation of aspirates one of the most challenging fields in diagnostic cytology. As clinicians become more experienced with the technique and pathologists gain confidence in their ability to evaluate aspirates, aspiration cytology may prove to be one of the most valuable and widely accepted tools for the diagnosis of tumors of the female pelvis.⁽¹⁷⁾

Granberg et al.,^(6,7) reported on 46 out of 60 young women who developed no new cystic tumors in the lower pelvis within a year of the last puncture.

Eight of the 60 had to be aspirated twice, and 2 of the 60 required three aspirations. No complications were reported for any of the 72 aspirations. In this study for the treatment of pelvic pseudocysts, 5 of the 13 required only one aspiration, while 6 patients required 2. Only 2 patients needed more than 2 aspiration procedures, and none of the patients in this study required more than 4. Ultrasound-guided puncture of cystic tumors in the lower pelvis seems to be a viable alternative to laparoscopically-guided puncture or laparotomy. Ultrasound-guided techniques may also lessen the risk of developing pelvic adhesions.⁽⁹⁾ In this study, 5 of the 13 patients required neither surgery nor aspiration after the first procedure. Based on the criteria of a previous study,⁽¹⁸⁾ we defined recurrent disease as a cyst with a diameter of more than 3 cm, found by sonography in the same location. After the last cycle and regular follow-up, the period of no further recurrence rose to 50.38 months. In the Granberg study, 70% of the women had neither cyst recurrence nor the need to undergo surgery within the one-year follow-up period.⁽⁶⁾ Montanari et al., in their study of ovarian cysts, reported five recurrences out of 45 (11%) in aspirations via laparoscopy, compared with 8 out of 18 (44%) in ultrasound-guided punctures over a 6-month follow-up period.⁽¹⁹⁾ De Crespigny et al., in their study of simple ovarian cysts, had 6 recurrences out of 60 (10%) clear fluid aspirations. Para-ovarian cysts had a recurrence rate of 11%. In the De Crespigny study of simple ovarian cysts, 12 patients out of the 30 (40%) who underwent clear fluid aspiration experienced a recurrence of the cyst within 6 months.⁽²⁾ In this study, the first we know of on pelvic pseudocysts, there were a total of 25 treatment cycles using ultrasound-guided aspiration. After 6 months of follow-up, 22 out of 25 (88%) cycle treatments had no evidence of recurrence and after twelve months of follow up, 18 out of 25 (72%) cycle treatments had no evidence of recurrence. Ten of the 13 patients (76.9%) had more than 2 recurrence-free years, 8 of the 13 (61.5%) had over 3, 6 of the 13 (46.2%) had over 4, and 4 of the 13 (30.8%) patients had over 5 recurrence-free years. Although the size of the recurrent cysts was significantly smaller than the original cysts, further research is needed to address problems such as the technical inability to achieve the complete aspiration of clear cysts.⁽²⁾ In this study of pelvic pseudocysts, we found there was

no correlation between the size of the pelvic pseudocyst and occurrence of clinical symptoms. One patient, only one month post aspiration, had abdominal pain and aspirated 140 ml fluid, with a further aspiration 6 months after regular follow up yielding 250 ml without serious symptoms. Another patient accumulated a large pseudocyst without serious symptoms, which was accidentally found after 6 months follow up.

In this study, we attempted to perform irrigation with starch following aspiration. Nine patients were included in this clinical trial. Five out of the 9 patients required only one treatment cycle, 3 out of the 9 required 2 aspirations and only one patient required more than 2. Thus, 55.6 % of the patients had no evidence of disease after only one treatment cycle, and 88.9 % of the patients had no evidence of disease after 2 treatment cycles. The interval without symptoms or without evidence of disease after the last treatment cycle was as long as 95 months. The recurrence rate of aspiration with starch irrigation is 20% with starch, and 10% without, after 6 months of follow up. After 12 months of follow up, 33% of those irrigated with starch had a recurrent pelvic pseudocyst while 30% without starch experienced recurrence. The interval between aspirations with starch irrigation is 32.8 months, while it is 36.4 months without. With so few cases, however, definitive conclusions about the relative merits of starch irrigation cannot be drawn from this study.

In conclusion, the advantages of ultrasound-guided transvaginal cyst aspiration include the following: shorter hospital stays, the ability to perform the procedure in an outpatient setting, rapid recuperation, excellent patient acceptance, low procedure-related complication rates, and the ease and simplicity of the procedure.⁽²⁰⁾ Ultrasound-guided aspiration of pelvic pseudocysts has the potential of becoming the preferred treatment for high-risk cases of recurrent benign cysts. Additionally, it eliminates the need for repeat laparotomy, thereby reducing patient suffering. Definite conclusions regarding irrigation with starch after ultrasound-guided aspiration cannot be drawn from this study.

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經陰道超音波抽吸以治療骨盆腔偽囊腫：初步成效評估

蔡景州 沈中章 張簡展照 許德耀 龔福財 張旭陽 張明揚¹ 黃富仁

背景： 針對卵巢腫瘤，以經陰道超音波抽吸的治療方法，已有許多的文獻報導。但經陰道超音波抽吸，以治療骨盆腔偽囊腫的療效目前文獻報導仍然有限。對於曾經接受開腹手術，而有復發性骨盆腔偽囊腫病人，可能需要面臨再次開腹手術的情況。利用經陰道超音波抽吸骨盆腔偽囊腫，可避免再次開腹手術的情況發生。

方法： 在1993年4月至2001年10月間，總計有14位門診病人因罹患骨盆腔偽囊腫，以經陰道超音波抽吸後，加或未加入滑石粉沖洗的方法治療。這些病人除一位是Ib期子宮頸癌以外，其餘是因子宮腺肌症或肌瘤接受開腹骨盆手術。總計有25個療程進入分析，其中有15個療程加入滑石粉沖洗，而有10個療程未加入滑石粉沖洗。

結果： 在13位病人追蹤時間超過6個月的25個療程中，有88%療程在6個月內未曾復發，有72%療程在一年內未曾復發。而有5位病人只接受1次療程即未復發，有6位病人接受2次療程後未復發。只有2位病人接受3次以上的療程。在一年後的追蹤發現，使用加入滑石粉沖洗的病人平均有33%的復發率，而未使用滑石粉沖洗的病人平均有30%的復發率。

結論： 經陰道超音波抽吸的方法可避免再次開腹手術的情況發生，所以是治療復發性骨盆腔偽囊腫的好方法。

(長庚醫誌 2002;25:751-7)

關鍵字： 骨盆腔偽囊腫，囊腫抽吸術。