

Original Article

# Laparoscopic Posthysterectomy Vaginal Vault Excision for Chronic Pelvic Pain and Deep Dyspareunia

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**ABSTRACT** **Study Objective:** To evaluate the outcome of posthysterectomy laparoscopic vaginal vault excision and its long-term effects on chronic pelvic pain, dyspareunia, quality of life, and patient satisfaction.

**Materials and Methods:** This is a retrospective cohort study (Canadian task force classification II–3) incorporating case note review and a postal questionnaire. It describes 22 consecutive patients who underwent laparoscopic vaginal vault excision for posthysterectomy dyspareunia and chronic pelvic pain. At laparoscopy, full thickness vaginal vault was excised along with scar tissue or any cyst. The vaginal cuff was closed laparoscopically. The patients were sent a validated questionnaire to assess their pain scores, general health, quality of life, and satisfaction with the surgery. The mean interval from vaginal vault excision and to questionnaire distribution was 1.8 years. The statistical analysis was performed with SPSS 15.

**Results:** The mean age of the women was 40 years. All women had vaginal vault tenderness on examination and underwent laparoscopic vaginal vault excision. The only intraoperative complication was 1 puncture injury of the bladder, which was produced by 10-Veres needle during manipulation. A single or a combination of additional procedures was performed at the same time. The patient satisfaction questionnaires were received from 16 (72.7%) women. Of the 16 (72.7%) respondents, 13 (81.25%) confirmed improvement in dyspareunia. The mean pain scores decreased, and quality of life and general health improved significantly after vaginal vault excision ( $p < .05$ ,  $t$  test).

**Conclusion:** Laparoscopic vaginal apex excision is a safe and effective management option after carefully excluding other causes of deep dyspareunia and chronic pelvic pain. It also provides an opportunity to detect and surgically excise previously undiagnosed endometriosis and other disease. *Journal of Minimally Invasive Gynecology* (2009) 16, 326–32 © 2009 AAGL. All rights reserved.

**Keywords:** Dyspareunia; Vaginal vault excision; Laparoscopy

Hysterectomy is the most common major gynecologic procedure performed in the United States and in the United Kingdom. More than 100 000 procedures are performed annually in the United Kingdom and 600 000 in the United States, including approximately 10% for the diagnosis of chronic pelvic pain [1–4]. Women who underwent hysterectomy for chronic pelvic pain have been reported to be pain free in 74% to 90% of cases [5]. However, a small group of women will continue to have pain even after hysterectomy. Chronic pelvic pain after hysterectomy is a well known condition and may be associated with bladder, bowel, or sexual

dysfunction. The Maryland women's study, a prospective survey of surgical outcomes in more than 1200 women undergoing hysterectomy, reported that 2.3% of women who were pain free before the procedure had development of dyspareunia after hysterectomy [6]. It means out of 600 000 women undergoing hysterectomy in the United States, 15 000 women are at risk of posthysterectomy dyspareunia [7].

The various causes of posthysterectomy pelvic pain described in the literature are intrinsic vaginal apex pain, residual ovary syndrome, ovarian remnant syndrome, postoperative adhesions, and existing or recurrent endometriosis [8,9]. Among women with posthysterectomy pain are a proportion of women with vaginal apex pain leading to deep dyspareunia. On a Medline Database search with the MeSH term *posthysterectomy, chronic pelvic pain, laparoscopy, surgery, excision*, only 2 case series describing results of vaginal vault excision and a case report was found [7,10,11].

Treatment of posthysterectomy chronic pelvic pain and dyspareunia may be challenging and complex. Treatment options

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generally involve advice to adopt alternative posture at sexual intercourse, injections of local anesthetic into the vaginal vault, and diagnostic laparoscopy to assess the pelvis, especially if the vaginal vault is tender. Excision of the vaginal vault as a treatment option for deep dyspareunia and chronic pelvic pain with improvement in symptoms has been reported [10]. The purpose of this study is to report the outcome of laparoscopic vaginal vault excision for chronic pelvic pain and deep dyspareunia after hysterectomy and evaluate the long-term effects of laparoscopic vaginal vault excision on chronic pelvic pain, dyspareunia, quality of life, and patient satisfaction.

## Methods

This is a retrospective cohort study incorporating retrospective case note review and a postal questionnaire. This case series describes 22 consecutive patients of laparoscopic vaginal vault excision for posthysterectomy dyspareunia and chronic pelvic pain who were referred to Dewsbury and District Hospital from 2002 to 2007. The variables for data collection were age, hysterectomy information (route, indication, additional surgery performed concomitantly), abdominal surgery performed after hysterectomy, complications, timing of initial onset of chronic pelvic pain and dyspareunia, and chief presenting complaints (pelvic pain, dyspareunia) and signs (vaginal tenderness and vaginal vault thickness). Surgical variables related to the vaginal apex excision procedure were concomitant surgery, theater occupancy time, complications, days of postoperative stay and histopathologic study of excised disease.

All these patients were seen in the gynecologic pain clinic and were thoroughly counseled about the risks of surgery. The patients undergoing vaginal vault excision were given bowel preparation as Fleet Phospho-soda oral solution (disodium phosphate, dodecahydrate, sodium dihydrogen phosphate dehydrate, EC De Witt and Co. Ltd., Warrington, UK) a day before the operation. All cases were carried out by a single laparoscopic surgeon (A.K.T.) at Dewsbury and District Hospital. At laparoscopy, a 10-mm trocar was placed at the umbilicus for the introduction of the laparoscope, and 2 lateral, 5-mm and 10-mm ports were placed just below the level of umbilicus. Both abdominal and pelvic cavities were inspected for abnormal pathologic characteristics. A sponge holding forceps in the vagina was opened to stretch and raise the vaginal apex and allow easier visualization of the apical area from the laparoscopic view. The bladder was identified precisely by filling the bladder with sterile water 100 to 200 mL with methylene blue through a Foley catheter. The ureters were visualized in the pelvic sidewall. To delineate the course of the rectum and its relation to the vaginal vault, a probe was also inserted into the rectum.

After mobilizing the bladder and bowel away from the vaginal vault, the apex of the vaginal vault was cut with laparoscopic scissors and the top of the vaginal vault was excised. Hemostasis was achieved by use of endoscopic micro-bipolar forceps with bipolar coagulation at 12 to 15 watts current. The vaginal vault

edges were then stitched with a single layer horizontally with Vicryl 2-0 (Polyglactin 910, taper needle, Ethicon Vicryl 2-0, Number 9466; Ethicon, Cincinnati, OH), thus creating a new vaginal apex. It was not our practice to elevate the cuff to the remnants of the uterosacral ligaments. The vaginal apex was excised with endoscopic scissors along with any thickened scarred area and any disease in the vaginal vault (thickened area, inclusion cyst, or endometriotic cyst). With the sponge holding forceps in place in the vagina, a glove with a swab inside was used to fill the vagina and prevent leakage of gas and maintain pneumoperitoneum. The tissue removed was sent for histologic examination. Any other disease in the pelvis such as adhesions or endometriosis or ovarian cyst was dealt with at the same time laparoscopically. All patients received intravenous antibiotics, and Adept (4% icodextrin solution; Baxter HealthCare Limited, Berkshire, United Kingdom) was instilled into the pelvis and the abdominal cavity at the end of the operation. During the operation irrigation of the pelvic cavity was undertaken with normal saline solution 0.9% followed by final irrigation with Adept, and up to 500 mL was left in the pelvic cavity at the end of the operation.

The patients were sent a questionnaire in August 2007 to assess their pain score with intercourse, defecation, and micturition, backache, general health, quality of life, and satisfaction with the surgery. The mean interval from vaginal vault excision and to questionnaire distribution was 1.8 years. A user-friendly questionnaire was designed by incorporating the pain score, health status, and quality of life 5-point visual analogue scale pictures from the Dartmouth Primary Care Cooperative Information Project Chart system quality of life questionnaire. These charts have been widely used in North America and have been tested for their reliability, validity, and acceptability [12]. The response options were in the form of pictures that patients could select before and after the operation. The participants were categorized as improved if levels of pain decreased by 1 category or worsened if they were worsened by 1 category. The statistical analysis was performed with Statistical Package for Social Sciences, Version 15 (SPSS, Chicago, Illinois). The Student *t* test was used as a statistics to compare interval variables. The mean difference was chosen to be significant at  $p < .05$ .

## Results

All 22 patients had chronic pelvic pain and dyspareunia as a symptom. All women had vaginal vault tenderness on examination, and 6 (27.3%) had vaginal vault thickness. All 22 women had received conservative advice measures such as analgesics and coital position change and had continued to experience pain. All 22 women underwent diagnostic laparoscopy first to assess the pelvis, vaginal vault, and any additional disease. The vaginal vault excision was then planned at a later date.

The mean age of the women at the time of vaginal vault excision was 40.3 years (range 35 to 56 years). The mean age at the time of hysterectomy was 34.55 years (range 27

Table 1  
Intervening surgery after hysterectomy and before vaginal vault excision for chronic pelvic pain

Case number	Histologic condition at hysterectomy	Intervening surgery after hysterectomy and before vaginal vault excision
1	Normal	Laparotomy and adhesiolysis
2	Endometriosis	Laparotomy and adhesiolysis
3	Fibroid	Laparoscopic right salpingo-oophorectomy and peritoneal biopsy
4	Normal	Laparoscopic radical excision of endometriosis + ovarian adhesiolysis + bilateral salpingectomy
5	Normal	Laparotomy and right adnexal pseudocyst drainage and adhesiolysis
16	Endometriosis	Laparoscopic left salpingo-oophorectomy and adhesiolysis
17	Endometriosis	Laparoscopic left salpingo-oophorectomy + adhesiolysis + coagulation of pelvic endometriosis
18	Normal	Laparoscopic radical excision of endometriosis + bilateral ovarian and omental adhesiolysis
19	Fibroid	Laparoscopic left salpingo-oophorectomy + radical excision of pelvic peritoneum + bowel adhesiolysis
21	Endometriosis	Laparoscopic bilateral salpingectomy and adhesiolysis
22	Endometriosis	Laparoscopic left salpingo-oophorectomy and adhesiolysis
		Laparoscopic right salpingo-oophorectomy and adhesiolysis
		Laparoscopic radical excision of endometriosis and adhesiolysis
		Laparoscopic coagulation of endometriosis with helium

to 45 years). The mean interval between hysterectomy and vaginal vault excision was 5.95 years (range minimum 1 year to maximum 22 years). The route of hysterectomy was abdominal in 12 (45.5%) and laparoscopic assisted vaginal hysterectomy in 10 (54.5%). The indications for hysterectomy were chronic pelvic pain in 13 (59.1%), menorrhagia 6 (27.3%), menorrhagia and chronic pelvic pain 1 (4.5%), and others 2 (9.1%). The histologic study of the entire specimen removed at the time of hysterectomy had confirmed endometriosis in 10 (45.5%), fibroid in 4 (18.1%), and no abnormality in 8 patients (36.4%). In 12 cases of abdominal hysterectomy and 10 cases of laparoscopic assisted vaginal hysterectomy, clinical case notes were not examined for details of cuff suspension. Moreover, all women did not undergo hysterectomy in our unit. We therefore do not have the details of cuff suspension at the time of hysterectomy. Of 22 women, 21 (95.5%) women had chronic pelvic pain before hysterectomy and 1 (4.5%) in whom chronic pelvic pain began 10 years after hysterectomy for heavy painful periods at age 31 years. For chronic pelvic pain, 11 (50%) underwent intervening surgery after hysterectomy but before vaginal vault excision, as summarized in Table 1. All patients underwent laparoscopic vaginal vault excision by 1 surgeon (A.K.T.). The only intraoperative complication was 1 puncture injury of the bladder, which was produced by the Veres needle during manipulation. The puncture injury of the bladder was stitched laparoscopically with overlapping stitches. There was no postoperative complication. No patient required blood transfusion, and all were discharged after overnight stay. The mean theater occupancy for the operation was 219 minutes nearly lasting on average for 4 hours for excision of vaginal vault with or without additional procedures (anesthetic and theater time). A single or a combination of additional procedures was performed at the time of vaginal vault excision. These were radical peritoneal excision 2 (9.1%), adhesiolysis 14 (63.6%), ovarian cystectomy 7 (31.8%), oophorectomy 2 (9.1%), ovarian surface coagulation 4 (18.2%), and others 11 (50%). The other procedures were temporary ovarian suspension, salpingectomy, excision

of hydrosalpinx, peritoneal biopsy or excision of pelvic scar, cystoscopy, and bladder repair. Fig. 1 illustrates a laparoscopic view of the vaginal vault at the time of vaginal vault excision demonstrating an endometriotic cyst, and Fig. 2 illustrates an inclusion cyst of the vaginal vault. Fig. 3 demonstrates the vaginal cuff before excision, the open vagina after the cuff has been excised, and the sutured (closed) cuff. Histologic study of the excised vaginal vault tissue confirmed disease in 19 (86.4%), and 3 (13%) showed normal vaginal epithelium. The diseases reported were fibrous tissue, endometriosis, neuroma, inclusion cyst, chronic inflammation, and fibroma. Of 22 cases, 6 had endometriosis (4 cases of vaginal vault endometriosis, 1 "chocolate" cyst, and 1 pelvic peritoneal endometriosis). Of these 6, only 3 had endometriosis at the time of previous hysterectomy.

The patient satisfaction questionnaires were received from 16 (72.7%) women. Of the 16 (72.7%) respondents, 13 (81.25%) confirmed improvement in dyspareunia, 2 (12.5%) were not sexually active, and 1 (6.25%) reported no improvement. Fifteen patients (94%) will recommend this procedure to their friends with similar symptoms. The

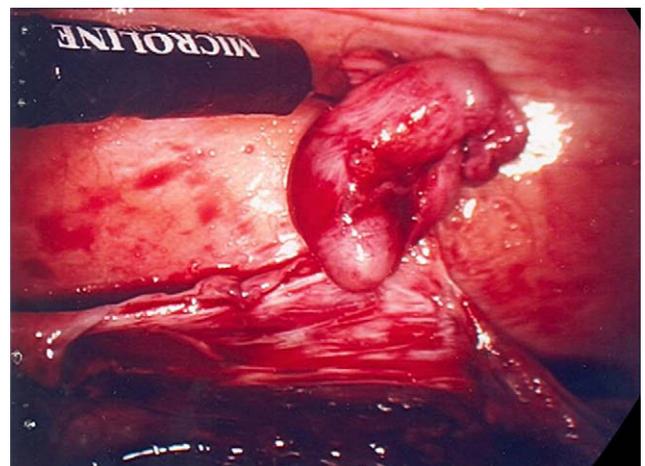


Fig. 1. Laparoscopic view vaginal vault endometriotic cyst.

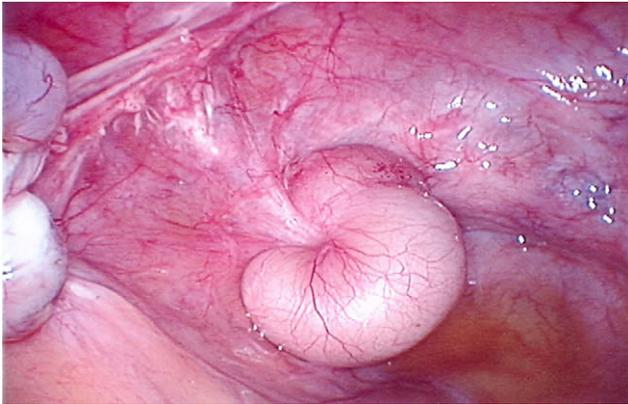


Fig. 2. Laparoscopic view of vaginal vault inclusion cyst.

longest interval between vaginal vault excision and improvement in pain score was 5 years (mean 1.8 years). The respondents and nonrespondents were similar with respect to age, type of hysterectomy, indication of hysterectomy, and presenting symptoms. The nonrespondents 6 (27.3%) however, were not readmitted nor had any surgical intervention after vaginal vault excision at Dewsbury Hospital according to

case note review in August 2007. We do not know whether these patients were admitted to other hospitals because there is no regional database. However, generally patients with laparoscopic surgery tend to be followed up by our own team. The mean pain scores decreased, and quality of life and general health improved significantly after vaginal vault excision as summarized in Tables 2 and 3.

## Discussion

In this retrospective cohort study, all cases with posthysterectomy vaginal vault dyspareunia were exclusively managed laparoscopically along with the opportunity to detect and treat previously undiagnosed endometriosis and other disease with minimal complications. These were difficult operations exclusively managed laparoscopically and lasting on average 4 hours (anesthetic and operation time), especially in cases with endometriosis and adhesiolysis. Moreover, follow-up of the patients supported it to be an effective and viable treatment option.

Posthysterectomy vaginal apex pain with deep dyspareunia, and chronic pelvic pain is a benign entity but can significantly affect women's social, emotional, and psychological

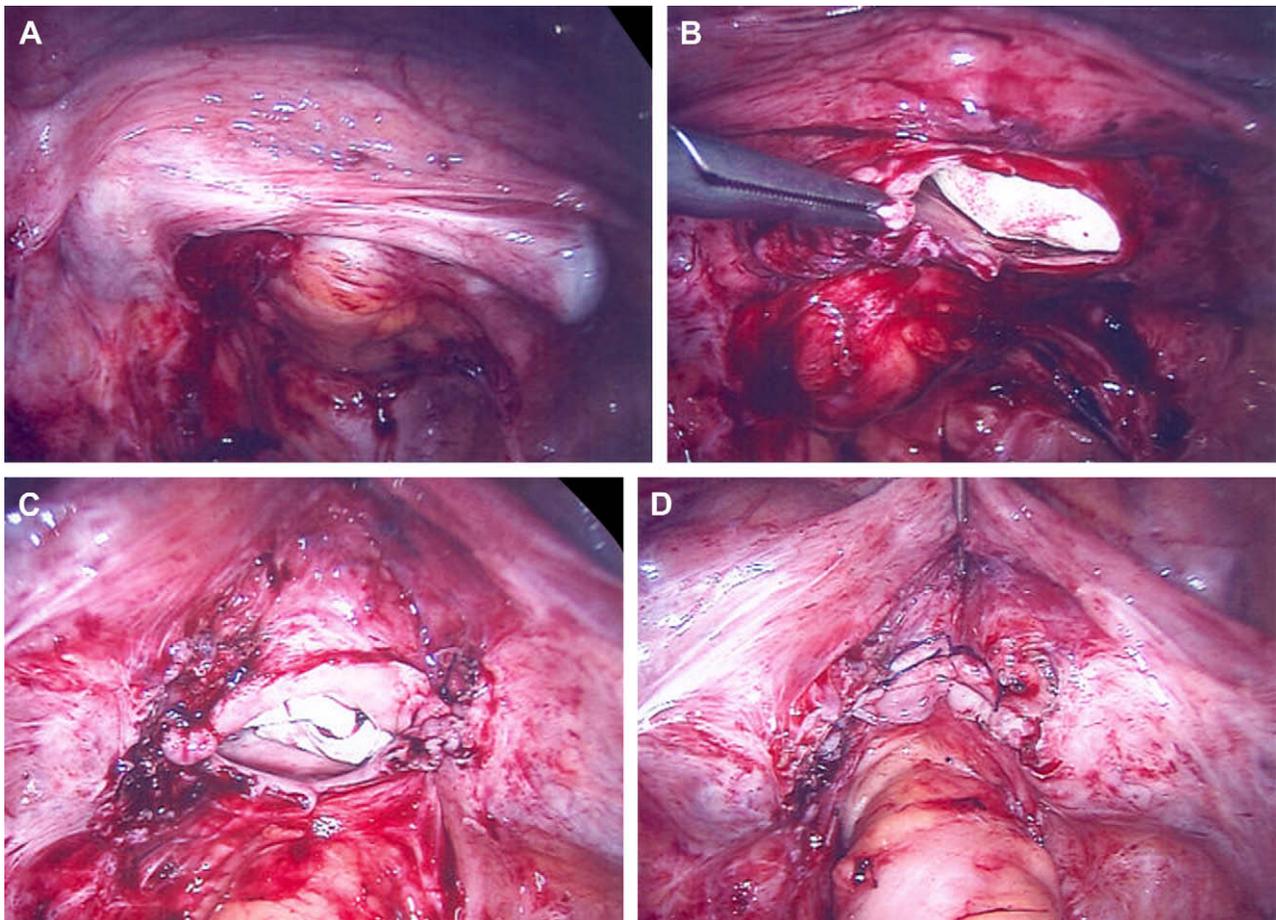


Fig. 3. **A**, Laparoscopic view of vaginal vault with vaginal probe before excision. **B**, Laparoscopic view of vaginal vault being excised. Glove with swab inside is used to fill the vagina and prevent leakage of gas and maintain pneumoperitoneum. **C**, Laparoscopic view of vaginal vault excision complete. Glove with swab inside to obliterate the vagina. **D**, Laparoscopic view of vaginal vault stitching complete.

Table 2  
Comparison of patient responses (questionnaire) before and after vaginal vault excision

Questions	Before operation (Mean $\pm$ SD)*	After operation (Mean $\pm$ SD)*	Mean difference (95% CI)	P <sup>†</sup> value
How would you rate your health in general?	4.00 $\pm$ 0.632	2.56 $\pm$ 0.964	1.44 (0.92–1.95)	<.001
How would you rate the quality of your life?	4.06 $\pm$ 0.574	2.63 $\pm$ 1.025	1.44 (0.92–1.95)	<.001
How much pain do you have during sexual intercourse?	4.50 $\pm$ 0.855	2.36 $\pm$ 1.277	2.14 (1.33–2.95)	<.001
How much pain do you have just after intercourse?	4.50 $\pm$ 1.092	1.86 $\pm$ 1.027	2.64 (1.91–3.38)	<.001
How much pain do you have when opening your bowels?	3.19 $\pm$ 1.559	2.19 $\pm$ 1.276	1.00 (0.30–1.70)	.008
How much pain do you have when passing urine?	2.38 $\pm$ 1.586	1.56 $\pm$ 1.094	0.81 (0.29–1.34)	.005
How much backache do you have?	3.75 $\pm$ 1.483	2.69 $\pm$ 1.078	1.06 (0.02–2.10)	.045
How much pain do you have at other times?	4.31 $\pm$ 0.793	2.75 $\pm$ 1.065	1.56 (0.86–2.26)	<.001

\* Mean  $\pm$  SD using VAS (1–5).

† P values were determined by Student *t* test (n = 16).

well-being. It is a challenge for clinicians because the diagnosis of the cause and treatment has always been a dilemma. After careful clinical assessment and exclusion of other causes and psychosomatic aspects, posthysterectomy dyspareunia, and vaginal vault tenderness need laparoscopic assessment because it gives an opportunity to treat any disease along with the excision of vaginal vault, if needed.

We reported our practice of dealing with posthysterectomy vaginal apex pain, dyspareunia, and chronic pelvic pain. Additional procedures were also performed at the time of vaginal vault excision, which may itself relieve the pain. The role of adhesiolysis in relieving postoperative pain, excision of endometriosis, and excision of residual ovary for residual ovary syndrome as a cause for chronic pelvic pain and dyspareunia have been well reported [13–16]. It is therefore difficult to generalize the improvement in dyspareunia solely because of vaginal vault excision because we undertook additional procedures for other diseases.

There are only 2 case series in the literature reporting the role of vaginal vault excision for this condition [7,10]. However, in the previous 2 case series the concomitant diseases were identified, but vaginal apex excision was mainly done by laparotomy. The series of 27 cases of Lamvu et al [7] underwent vaginal apex excision by laparoscopic approach, as well as laparotomy. In the case series of Sharp et al [10], 4 of 9 women underwent vaginal vault excision laparoscopically, 4 were converted to laparotomy, and 1 underwent laparotomy. All their patients underwent vaginal vault injection with local anesthesia, and they were then offered excision after local anesthetic infiltration had confirmed pain relief. However, in our series, cases were selected by thorough clinical assessment, and local anesthesia was not offered. Moreover, in this series all cases were treated exclusively by laparoscopy. This is especially

ideal to visualize and excise pelvic peritoneal endometriosis and to perform ovarian adhesiolysis and bladder and bowel dissection away from the vaginal apex. Accurate dissection of bladder and division of adhesions with laparoscopic magnification prevented any visceral damage, and absolute attention to hemostasis leads to minimal pelvic adhesions as seen at second-look laparoscopy [17].

The series of 9 patients of Sharp et al [10] reported a decrease in dyspareunia and improvement in coital frequency in 8 of 9 patients (88.8%). Lamvu et al [7] reported in a prospective case series of 27 women that 67% of respondents confirmed improvement in dyspareunia for a median of 20 months. They also demonstrated that pain relief is temporary, and women will require ongoing medical help. Contrary to this, in our series 13 (81.25%) respondents confirmed improvement in dyspareunia for a mean of 1.8 years with longest follow-up up to 5 years. Moreover, it has been reported that there is less improvement in symptoms in women with associated symptoms like irritable bowel syndrome and vulvodynia [7]. Our retrospective study did not allow us to evaluate exactly any history of other associated pain syndromes, use of analgesics and antidepressants. Furthermore, there is evidence that pre-hysterectomy diagnoses of pelvic pain did not prevent pain with vaginal vault excision in most cases [10]. This is, however, not supported by our findings because in this series 21 of 22 had pelvic pain before hysterectomy.

Our successful outcome up to 5 years (mean 1.8 years) has implications in practice. Patients with chronic pelvic pain and dyspareunia after hysterectomy need empathy from the gynecologist and careful assessment. As shown in our series there may be a pelvic disease that may be the cause for pain and can be surgically corrected. These patients should not be discharged to pain clinics because gynecologists can help

Table 3  
Patient satisfaction with the vaginal vault excision

Question	Yes	No	Not sure	Missing	Total
Has the operation improved your symptoms?	15 (68.2%)	1 (4.5%)	0	6 (27.3%)	22 (100%)
Would you recommend this to a friend who has the same condition?	14 (63.6%)	1 (4.5%)	1 (4.5%)	6 (27.3%)	22 (100%)

them further, and more can be done to combat their misery and pain. This study has several limitations. First, the data are retrospective, relying on the case notes. Second, the questionnaire involved questions relying on patients' recall of pain score before surgery, which may have been 5 years ago. Third, although there was statistical significant improvement in pain scores, it is a small case series with no case controls. Finally, improvement in symptoms can not be attributed solely to vaginal vault excision because patients had additional surgeries that could be the reason for improvement in pain.

How excision of the vaginal vault improves dyspareunia is still debatable. It is still controversial whether vaginal apex pain is neuropathic pain arising from inflammatory and repair mechanism of neural tissue in response to surgical tissue trauma or is it mainly due to additional disease in the vault. The histologic study of the excised tissue confirmed endometriosis, inclusion cyst, fibrosis, chronic inflammation, and neuromas, which is in concordance with other studies [7–10]. Proliferation of nerve cells initiated by surgical trauma can get organized into painful neuromas [18]. Moreover, the fibrotic nodules of endometriosis are biologically active and can invade deeply, causing deep dyspareunia, chronic pelvic pain, and dyschezia [19]. These ectopic endometrial lesions are innervated by nerves, which may play a pathogenic role [20,21].

The questionnaire evaluated the visual analogue pain score (1-5) before and after operation with sexual intercourse, defecation, micturition, backache, and at other times, as well as the effect of pelvic pain on quality of life and health in general. The Dartmouth Primary Care Cooperative Information Project Chart questionnaire was selected because it is reliable, validated, and user friendly [12]. However, our questionnaire did not involve questions regarding the effect of vaginal vault excision on daily activities and return to work. Improvement in these parameters after excision of the vault has been demonstrated [10].

In the future, a randomized control trial or case control study is recommended to provide better evidence for the effectiveness of laparoscopic vaginal vault excision. Moreover, adequately powered case controlled or randomized controlled trials will also be suitable to demonstrate correlation, if any, between indication of hysterectomy, histologic study of the uterus and ovaries, and histologic study of the excised vaginal vault.

## Conclusion

Posthysterectomy vaginal apex pain is a known cause for dyspareunia and chronic pelvic pain. Laparoscopic vaginal apex excision is a safe and effective management option after carefully excluding other causes of deep dyspareunia and chronic pelvic pain, and this approach also provides an opportunity to detect and surgically excise previously undiagnosed endometriosis and other disease.

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