Sexual function after total laparoscopic hysterectomy or transabdominal hysterectomy for benign uterine disorders: a retrospective cohort

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Abstract

The objective of this study was to evaluate changes in sexual function after total laparoscopic hysterectomy (TLH) or transabdominal hysterectomy (TAH). This retrospective cohort study included patients with benign uterine tumors that were divided into TLH group and TAH group based on the hysterectomy technique used. Baseline, intraoperative, and postoperative characteristics were compared between groups. Postoperative sexual function was assessed using the Brief Index of Sexual Functioning for Women. The TLH and TAH groups contained 119 patients (age, 51.5 ± 6.1 years) and 126 patients (age, 50.0 ± 4.7 years), respectively. Baseline characteristics were comparable between groups, although uterine size was larger in the TAH group (P < 0.001). Compared with the TAH group, the TLH group had a longer operative time (130.0 ± 36.2 min vs 107.3 ± 28.5 min, P < 0.001), lower pain index at 24 h (2.0 ± 1.6 vs 4.0 ± 2.6, P < 0.001), and shorter hospitalization time (5.7 ± 1.1 vs 8.1 ± 1.2 days, P < 0.001). Many patients in the TLH and TAH groups reported decreased satisfaction with their sexual life (67.5 and 56.0%, respectively), reduced frequency of sexual activity (70.1 and 56.0%, respectively), decreased libido (67.5 and 56.0%, respectively), orgasm dysfunction (42.9 and 42.9%, respectively), and increased dyspareunia (77.9 and 85.7%, respectively). However, there was no significant difference between groups in any of the indexes of postoperative sexual function (P > 0.05).

Both TLH and TAH had comparable negative effects on sexual function in women treated for benign uterine tumors in China, with a decreased frequency of sexual activity, reduced libido, orgasm dysfunction, and increased dyspareunia.

Key words: Hysterectomy; Laparoscopy; Laparotomy; Sexual activity

Introduction

Hysterectomy is the most common gynecologic surgical procedure performed worldwide, with rates of 2–5 per 1000 women in North America, Europe, Australia, and China (1–4). Hysterectomy is used to treat a wide variety of benign and malignant medical conditions, including fibroids, prolapse, abnormal uterine bleeding, pelvic pain, and cervical, endometrial, and ovarian cancer (5,6). Currently, hysterectomy is performed using one of three surgical approaches: laparoscopic, transabdominal, or transvaginal (7).

Although hysterectomy is generally considered to be a safe procedure, it is associated with a number of complications including vaginal cuff dehiscence and injuries to nervous, urinary, and gastrointestinal structures (7). There is also evidence that hysterectomy can lead to changes in sexual function, with differing effects depending on whether the underlying condition being treated is benign or malignant (8,9). Most studies have reported that hysterectomy for benign diseases results in an overall improvement in sexual function (10–15), likely because of the alleviation of symptoms such as abnormal uterine bleeding and pelvic pain (16). However, around 20–40% of patients with benign disease experience a worsening of sexual function after hysterectomy (17–19), and one study even showed an overall worsening of sexual function (20). Furthermore, clinical studies of women with malignant disease have consistently reported a worsening of sexual function after hysterectomy (21–26), and hysterectomy was found to be a factor associated with poorer sexual function in middle-aged women (27). Several studies have evaluated whether sexual function outcomes after hysterectomy are influenced by the technique used (9). However, limited data are available comparing sexual function outcomes between laparoscopic hysterectomy and transabdominal hysterectomy.

Therefore, the aim of this retrospective cohort was to compare the changes in the patients’ sexual function between laparoscopic hysterectomy and abdominal hysterectomy.

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Material and Methods

Study design and participants

This was a retrospective cohort of patients with benign tumors of the uterus admitted to Zhenjiang Maternal and Child Health Hospital, Jiangsu Province, China between January 2013 and December 2018. The inclusion criteria were: 1) menorrhagia, anemia, symptoms related to compression of adjacent organs, and/or progressive dysmenorrhea; 2) gynecologic and imaging investigations performed preoperatively and diagnosed as having cervical intraepithelial neoplasia (CIN) grade III lesions by a cervical human papillomavirus test, thin-prep cytologic test, colposcopy and biopsy, and/or loop electrosurgical excision procedure; and 3) no fertility requirements. The exclusion criteria to avoid complications affecting the operation effect and operation time were as follows: 1) surgical complications such as heart disease, thyroid and other medical diseases, and some surgical diseases such as extraperitoneal or sigmoid colon tumors; 2) cervical malignant lesions; 3) gynecologic malignant tumors; and 4) unstable clinical condition, such as blood pressure instability and uncontrollable blood sugar.

According to different operation methods, the patients were divided into total laparoscopic hysterectomy (TLH) and transabdominal hysterectomy (TAH) groups based on the hysterectomy technique used. The Medical Ethics Committee of Zhenjiang Maternal and Child Health Hospital approved the study. All patients provided informed written consent for their treatment.

Surgical procedures

Patients underwent preoperative ultrasonography or pelvic magnetic resonance imaging, if necessary. Intravenous antibiotics were administered half an hour before surgery to prevent infection, and additional antibiotics were given if surgery lasted for more than 3 h.

**TLH.** After the successful induction of general anesthesia, a puncture outfit was inserted into the abdomen via an umbilical incision, and the abdominal cavity was insufflated with CO2 gas. A trocar was inserted into the abdomen at the umbilical incision, and a laparoscope was introduced. The adnexal area on both sides was exposed using a cup-type uterine manipulator. A vascular closure device was applied to the right side. The left fallopian tube isthmus and ovarian proper ligament were clamped, ligated, and double-sutured with no. 7 silk suture, and the contralateral side was treated by the same method. The reflected peritoneum of the uterus and bladder was opened, and the bladder was pushed down to reach the lower part of the uterine manipulator, with care taken to avoid damage to the bladder. The uterine isthmuses were clamped, and the uterine arteries and veins were cut and double-sutured with no. 7 silk suture. The bilateral primary sacral ligaments and parametrical tissues were cut and clamped step-by-step, and the stump to the level of the external os of the cervix was ligated and sutured with no. 7 silk suture. The vaginal fornix was circumcised at the external os of the cervix. A piece of iodophor gauze was inserted into the vagina, and the uterus was removed. The vaginal stump was disinfected with iodophor and continuously sutured with 1–0 absorbable suture. After treatment of any active bleeding points and checking for any remaining intraabdominal gauze, the abdomen was closed layer by layer. After the operation, the intravaginal iodophor gauze was taken out, and the specimen was sent for pathologic examination.

**Outcome measures**

Baseline demographic and clinical characteristics were extracted from the medical records. The operation time (from the start of the skin incision to the completion of skin incision suturing), volume of intraoperative blood loss, change in hemoglobin (Hb) level during surgery, pain index at 24 h after surgery, postoperative intestinal air exhausting time, postoperative hospital stay, and any postoperative complications were noted. Patients were followed-up by telephone. Postoperative sexual function, including time to recovery of sexual life, frequency of sexual activity, postoperative libido, postoperative orgasm, postoperative sexual intercourse disorder, and postoperative dyspareunia,
was assessed using the Brief Index of Sexual Functioning for Women (BISF-W) (28). Each patient was followed up twice by telephone, and the interval was one month. The first follow up began more than half a year after the operation.

Statistical analysis
The data were analyzed using SPSS 20.0 (IBM Corp., USA). Count data are reported as number (%) and were compared between groups using the $\chi^2$ test. Normally distributed continuous measurement data are reported as means ± SD and were compared between groups using Student’s t-test. $P<0.05$ was considered statistically significant.

Results
Demographic and clinical characteristics of the study participants
A total of 245 patients were included in the final analysis, with 119 patients (mean age, 51.5 ± 6.1 years) in the TLH group and 126 patients (mean age, 50.0 ± 4.7 years) in the TAH group. The main diagnoses were uterine fibroids, adenomyosis, uterine fibroids with adenomyosis, and CIN III lesions. There were no significant differences in baseline clinical characteristics between the two groups (Table 1), except that uterine size was significantly larger in the TAH group than in the TLH group ($P<0.001$).

Intraoperative and postoperative characteristics
The operative time was significantly longer for the TLH group than for the TAH group ($P<0.001$), although intraoperative blood loss was similar between groups (Table 2). Compared with the TLH group, the TAH group had a higher postoperative pain index at 24 h ($P<0.001$), longer postoperative air exhausting time ($P<0.05$), and longer postoperative hospital stay ($P<0.001$). Postoperative complications occurred in 10 patients in the TLH group (upper respiratory tract infection, n=4; postoperative fever, n=2; urinary tract infection, n=2; acute enteritis, n=1; liver dysfunction, n=1) and 9 patients in the TAH group (postoperative fever, n=2; secondary suture of the incision, n=2; upper respiratory tract infection, n=1; urinary retention, n=1; urinary tract infection, n=1; acute lumbar disc herniation, n=1; diarrhea, n=1). The incidence of postoperative complications did not differ significantly between groups, and all complications were symptomatically treated.

Table 1. Comparison of baseline clinical characteristics between the total laparoscopic hysterectomy (TLH) and transabdominal hysterectomy (TAH) groups.

| Characteristic                        | TLH (n=119) | TAH (n=126) | P    |
|--------------------------------------|-------------|-------------|------|
| Age (years)                          | 51.5 ± 6.1  | 50.0 ± 4.7  | 0.463|
| Marriage duration (years)            | 28.0 ± 7.4  | 27.1 ± 5.4  | 0.301|
| Body mass index (kg/m²)              | 24.3 ± 3.0  | 24.3 ± 2.9  | 0.987|
| History of pelvic surgery            | 37 (31.1%)  | 46 (36.5%)  | 0.371|
| History of vaginal delivery          | 105 (88.2%) | 104 (82.5%) | 0.208|
| Uterine size (gestational week)      | 8.7 ± 3.7   | 11.1 ± 3.1  | <0.001|
| Preoperative hemoglobin (g/L)        | 117.3 ± 20.3| 112.9 ± 21.3| 0.099|

Data are reported as means ± SD or n (%). Statistical analysis was performed with Student’s t-test or the chi-squared test.

Table 2. Comparison of intraoperative and postoperative characteristics between groups.

|                          | TLH (n=119) | TAH (n=126) | P    |
|--------------------------|-------------|-------------|------|
| Operative time (min)     | 130.0 ± 36.2| 107.3 ± 28.5| <0.001|
| Operative blood loss (mL)| 95.2 ± 68.7 | 113.0 ± 89.3| 0.083|
| Pain index at 24 h        | 2.0 ± 1.6   | 4.0 ± 2.6   | <0.001|
| Postoperative air exhausting time (d) | 2.0 ± 0.5 | 2.1 ± 0.6 | 0.044 |
| Postoperative Hb change (g/L)| 9.1 ± 9.1 | 8.1 ± 8.2 | 0.387 |
| Postoperative hospital stay (d) | 5.7 ± 1.1 | 8.1 ± 1.2 | <0.001|
| Postoperative complications | 10 (8.4%)  | 9 (7.1%)   | 0.712|

Data are reported as means ± SD or n (%). Statistical analysis was performed with Student’s t-test or the chi-squared test. Hb: hemoglobin; TAH: total transabdominal hysterectomy; TLH: total laparoscopic hysterectomy.
A total of 34 (28.6%) patients in the TLH group and 31 (24.6%) patients in the TAH group were lost to follow-up, with no significant difference between groups in the number lost to follow-up. Therefore, evaluation of sexual function was performed for 85 patients in the TLH group and 95 patients in the TAH group. The educational backgrounds of the patients and their spouses were similar (Table 3), indicating that this would not be a factor biasing the assessment of sexual function. The majority of patients in both groups resumed sexual activity, and there were no significant differences between groups in the proportion of patients resuming sexual activity or the time to resumption of sexual activity (P \(>0.05\)) (Table 4). After surgery, many patients in both groups reported decreased satisfaction with their sexual life, reduced frequency of sexual activity, decreased libido, orgasm dysfunction, and increased dyspareunia. However, there was no significant difference between groups in any of the indexes of sexual function. Taken together, our preliminary data indicated that TLH and TAH have comparable negative effects on sexual function in women in China treated for benign uterine tumors.

### Discussion

The main findings of the present study were that substantial numbers of patients in the TLH and TAH groups reported decreased satisfaction with their sexual life, reduced frequency of sexual activity, decreased libido, orgasm dysfunction, and increased dyspareunia. However, there was no significant difference between groups in any of the indexes of sexual function (P \(>0.05\)).

Hysterectomy alters the anatomic relationships, innervation, and blood supply of the pelvic floor, which could theoretically alter sexual function (29). Although several previous studies have suggested that sexual function is often improved after hysterectomy for benign uterine disease due to alleviation of symptoms (10–16), a large minority of patients with benign disorders of the uterus exhibit a worsening of sexual function after hysterectomy (17–19). Indeed, Goktas et al. observed that total hysterectomy and bilateral salpingo-oophorectomy in women with benign disease led to a deterioration in sexual function, which was assessed using the Female Sexual Function Index (20). Güüt et al. (30) also reported the occurrence of sexual dysfunction after hysterectomy, but libido and sexual satisfaction subsequently improved 3 months to 2 years after surgery.

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**Table 3.** Comparison of the educational backgrounds of the patients and their spouses between groups.

| Index                                | TLH (n=85) | TAH (n=95) | P  |
|--------------------------------------|------------|------------|----|
| Educational background of the patients |            |            |    |
| Primary school                       | 9 (10.6%)  | 14 (14.7%) | 0.529 |
| Middle school                        | 38 (44.7%) | 51 (53.7%) |    |
| High school                          | 22 (25.9%) | 20 (21.1%) |    |
| College and above                    | 8 (9.4%)   | 6 (9.5%)   |    |
| Educational background of the spouses |            |            | 0.513 |
| Primary school                       | 3 (3.5%)   | 5 (5.3%)   |    |
| Middle school                        | 29 (34.1%) | 43 (45.3%) |    |
| High school                          | 35 (41.2%) | 35 (36.8%) |    |
| College and above                    | 10 (11.8%) | 8 (8.4%)   |    |

Data are reported as n (%). Statistical analysis was performed with the chi-squared test. TAH: total transabdominal hysterectomy; TLH: total laparoscopic hysterectomy.

**Table 4.** Comparison of overall satisfaction with postoperative sex life between groups.

| Index                                | TLH (n=85) | TAH (n=95) | P  |
|--------------------------------------|------------|------------|----|
| Resumption of sexual activity        | 77 (90.6%) | 91 (95.8%) | 0.160 |
| Time to resumption of sexual activity (d) | 134.4 ± 56.7 | 140.1 ± 67.4 | 0.558 |
| Overall satisfaction                 |            |            | 0.128 |
| Increased                            | 0          | 0          |    |
| Unchanged                            | 25 (32.5%) | 40 (44.0%) |    |
| Decreased                            | 52 (67.5%) | 51 (56.0%) |    |

Data are reported as means ± SD or n (%). Statistical analysis was performed with the chi-squared test. TAH: total transabdominal hysterectomy; TLH: total laparoscopic hysterectomy.
A notable finding of our study was that postoperative sexual function was comparable between the TLH and TAH groups. Our results are consistent with those reported in a small number of previous studies that directly compared laparoscopic and transabdominal hysterectomy in women with benign (31–35) or malignant (36,37) uterine disease. Our analysis identified a higher incidence of sexual dysfunction after hysterectomy than some previous studies (10–16). However, it should be noted that the quality of female sexual life before and after hysterectomy might be affected by numerous factors such as age, ethnicity, family structure, psychologic factors (including body esteem and relationship quality), socioeconomic status and educational background (20,22,38,39). After surgery, some patients may decrease the frequency of sexual activity due to worry about the adverse effects of sex life. Furthermore, pre-existing mental illnesses such as depression and sexual dysfunction are closely related to postoperative sexual dysfunction (9).

This study had some limitations. First, this was a retrospective analysis and so may have been prone to selection bias or information bias. Second, this was a single-center study, hence the generalizability of the findings is not known. Third, the sample size was small, so the study may have been underpowered to detect some real differences between groups. Fourth, psychologic factors were not assessed before and after surgery, so their possible influence on the results cannot be determined. Additional, prospective, multi-center studies with larger sample sizes are needed to confirm our findings.

In conclusion, our preliminary data suggested that TLH and TAH had similar negative effects on sexual function in women in China treated for benign uterine tumors.

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