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An evaluation of laparoscopic hysterectomy alone versus in combination with laparoscopic myomectomy for patients with uterine fibroids

Fumiaki Taniguchi[a,*], Natsuki Koike[b], Tadayuki Kikukawa[a], Maki Yabuta[a], Masami Yamaguchi[a], Emi Adachi[a,c], Takeo Nakayama[c]

[a] Department of Obstetrics and Gynecology, Takanohara Central Hospital, Nara City, Nara, Japan
[b] Department of Obstetrics and Gynecology, Nara Medical University, Kashiwara City, Nara, Japan
[c] Department of Health Informatics, Kyoto University School of Public Health, Kyoto City, Kyoto, Japan

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ABSTRACT

Objective: The purpose of this study was to compare surgical outcomes following conventional laparoscopic hysterectomy (LH) (C-LH) versus the combination method of LH plus laparoscopic myomectomy (LM) (LH + LM) for the treatment of large uterine fibroids.
Study design: This study was performed in 56 patients (uterine weights ≥500 g) who underwent either C-LH or LH + LM performed by the same surgeon between May 2010 and May 2016. LH + LM was performed when C-LH was problematic because of poor visibility and/or mobility due to uterine fibroids.
Results: The C-LH and LH + LM groups consisted of 27 (48%) and 29 (52%) patients, respectively. The clinical characteristics of patients differed significantly only in the median sizes of the dominant fibroid. The sizes of the dominant fibroid in the C-LH and LH + LM groups were 9.5 cm and 10.7 cm (P = 0.04), respectively. Regarding the surgical outcomes for the C-LH and LH + LM groups, the median uterine weights were 558 g and 737 g (P = 0.03), respectively, the median operating times were 156 min and 173 min (P = 0.23), respectively, and the median intraoperative blood losses were 150 g and 300 g (P = 0.0004), respectively. In all patients, LH was performed without conversion to laparotomy and there were no cases of bladder, ureteral, or gastrointestinal tract injury. There were no postoperative complications of Clavien-Dindo scale ≥ III in either group.
Conclusions: When C-LH cannot be performed because of large uterine fibroids that cause poor visibility and/or mobility, LH + LM may allow the procedure to be successfully completed without conversion to laparotomy. However, the latter approach increases the risk for intraoperative blood loss.

Introduction

Laparoscopic surgeries, such as laparoscopic hysterectomy (LH) and laparoscopic myomectomy (LM), are commonly performed for patients with benign diseases because these procedures are less painful and are associated with a shorter hospital stay and quicker return to daily routines than laparotomy [1–3]. Since Reich et al. [4] first reported performing LH in 1989, LH has become a common procedure for patients with uteri weighing ≥500 g [5–15] and, more recently, for patients with uteri weighing ≥1 kg [16–19]. Compared with LH for uteri weighing <500 g, LH for uteri weighing ≥500 g requires a longer operating time [6,8,13], is associated with greater intraoperative blood loss [6,8,13], and more frequently requires blood transfusions [6,13]. Moreover, a greater rate of conversion to laparotomy may occur in patients with uteri weighing ≥ 500 g [14,15]. In the study by Twijnstra et al. [15], conversion to laparotomy during LH was mostly caused by poor visibility and/or mobility and sometimes by uncontrolled bleeding. Thus, improving the visibility and/or mobility of the uterus can reduce the rate of conversion to laparotomy. Furthermore, improved visibility and mobility may also reduce the rate of abdominal hysterectomy. Poor visibility and/or mobility occasionally occur due to uterine fibroids. To reduce the rate of conversion to laparotomy, it is possible to perform LM during LH. There are few reports on this method [12], but they present the complete results of LH, including conventional laparoscopic hysterectomy (C-LH) and the combination method of LH and LM (LH + LM). To the best of

* Corresponding author at: Department of Obstetrics and Gynecology, Takanohara Central Hospital, 1-3-3 Ukyo, Nara City, Nara, 631-0805, Japan.
E-mail address: ftaniguc@gmail.com (F. Taniguchi).

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our knowledge, no reports to date have exclusively investigated cases of the LH + LM method.

In this study, we compared differences in surgical outcomes among patients treated with LH + LM versus C-LH with uteri weighing ≥500 g.

Materials and methods

This retrospective study was performed in 56 patients with uteri weighing ≥500 g who underwent LH for symptomatic uterine fibroids (performed by F.T.) between May 2010 and 2016 at the Takanohara Central Hospital. The indications for LH included hypermenorrhea, abnormal uterine bleeding, dysmenorrhea, pelvic pain, mass and pressure, and frequent urination. Pelvic examination, pelvic ultrasound, and magnetic resonance imaging (MRI) were performed. MRI revealed the size of the entire uterus; uterine fundus position; trocar inserting positions; the size, quantity, and location of fibroids; the presence or absence of degeneration or malignancy (I,e. sarcoma); necessity of myomectomy; and if necessary, which fibroid should be enucleated. LH was not performed in cases of suspected malignancy identified on MRI. All patients in this study received information regarding the advantages and risks of the surgery, and written consent was obtained. This study was approved by the Institutional Review Board of the Takanohara Central Hospital.

Surgical procedures

LH was performed under general anesthesia with endotracheal intubation. The patient was placed in the lithotomy Trendelenburg position. A catheter was placed in the bladder and a uterine manipulator was placed in the cervix for uterine mobilization. All patients received prophylactic antibiotics.

A 10-mm trocar was inserted through the umbilicus in the majority of cases, and 5-mm trocars were inserted into the lower abdomen on both sides. However, according to the position of the uterine fundus estimated with palpation and MRI, the positions of all 3 trocars were shifted upward to achieve good visibility. The surgery was performed using a maximum of 3 trocars. A pneumoperitoneum was created with carbon dioxide insufflation, and the abdominal pressure was maintained at 8 mmHg. The abdominal cavity was assessed for uterine size and mobility; the size, location, and numbers of uterine fibroids; visibility of uterine ligaments and vessels; adhesions; endometriosis; and ovarian cysts. When good visibility and mobility was obtained, LH was performed without LM. When poor visibility and/or mobility were caused by uterine fibroids, LM was performed during LH. This clinical decision was made by F.T. The patients undergoing LH without LM were designated as the C-LH group, whereas patients undergoing LM during LH were designated as the LH + LM group.

C-LH was performed as follows. The round ligament of the uterus was coagulated and cut with bipolar forceps and a Harmonic scalpel, and the broad ligament was opened. For patients in whom the ovaries were preserved, the utero-ovarian ligaments and fallopian tubes were coagulated and cut. For patients in whom the ovaries were removed, the infundibulopelvic ligaments were coagulated and cut. Next, the uterus was moved towards the upper body, using a uterine manipulator. After that, a 30° scope instead of a 0° scope was used in order to improve the visibility of the uterine cervical circumference. The surrounding tissues of the uterine cervix were mainly incised by using the laser. The laser was also used in the lysis of adhesions and endometriotic lesions. The anterior lobe of the broad ligament was then cut and the bladder was detached from the uterus by unfolding the peritoneum of the vesico-uterine pouch. The bladder was mainly bluntly separated by rubbing the cervical anterior wall. The crude connective tissues adhering to the posterior lobe of the broad ligament were bluntly separated. After confirming that there was no attachment of the ureter to the posterior lobe, the peritoneum was incised until near the vaginal fornix. Then, the ureter was naturally moved to the outer side. The ascending uterine vessels were exposed by detaching the surrounding tissues, and cauterized or ligated. Several small vessels that were present inside of the ascending uterine vessels were also cauterized or ligated simultaneously. The inside of the incised stump of the uterine vessel was cauterized toward the vaginal fornix and excised. After that, the uterine manipulator was removed and a cylinder-shaped vaginal pipe was inserted to check the position of the vaginal fornix. A circular colpotomy was performed with the Harmonic scalpel. When the uterus became free from the pelvic wall, hemostasis was performed before extracting the uterus. The uterus was transvaginally morcellated using either a scalpel or scissors and was removed from the abdominal cavity. The vaginal cuff was sutured transvaginally. After the intravenous administration of indigo carmine, cystoscopy was performed to check for urine flow from the ureteral openings and for the presence or absence of bladder injury. The cystoscopy was systematically used in all LH cases. After cystoscopy, hemostasis was achieved laparoscopically, and the skin wounds were closed. Pathological diagnosis was performed on all of the extracted tissues. The cases in which malignant findings were observed during the perioperative period were excluded from this study. The requirement for blood transfusion was made based on an assessment of intraoperative blood loss, patient vital signs, the result of laboratory investigations, progress of the surgery, and the presence of damaged thick blood vessels, among other parameters.

LM procedure in the LH + LM group

The size, location, and number of uterine fibroids were mainly revealed by MRI (Fig. 1A and B). Uterine fibroids that caused poor visibility and/or mobility (Fig. 2A) were removed laparoscopically. To reduce bleeding risk, the round ligaments, ovarian ligaments, or infundibulopelvic ligament were coagulated and cut before performing LM, when possible. A dilute vasopressin solution (20 U in 50 mL of saline) was injected into the normal myometrium around the fibroids. After confirming the vasopressin effect, the myometrium was incised using a Harmonic scalpel, and the incision was extended until it entered the uterine fibroids through the myometrium and pseudocapsule. The fibroid was grasped using Martin grasping forceps. The enucleation was performed with separation between the pseudocapsule and uterine fibroids, in order to simplify the enucleation and reduce bleeding. The enucleated fibroids were gathered by threading them with needle-tipped No. 1 Vicryl suture (cut to approximately 30 cm lengths, with the cut end ligated several times) to ensure that they were not lost in the abdominal cavity. The bleeding after the enucleation was stopped with bipolar cautery. The wounds were roughly sutured with No. 1 Vicryl, which is not the usual suturing technique for standard LM (Fig. 2B). When massive bleeding was recognized after the enucleation (Fig. 3A), big sutures were placed from side to side, including over the incision wound (Fig. 3B–D). After LM successfully decreased the size of the uterus and improved the visibility and/or mobility, LH was performed as described above. After the uterus was completely detached from the pelvic wall, the uterine fundus and the removed fibroids were connected with No. 1 Vicryl sutures (Fig. 4). After the uterus was extracted transvaginally, the connecting thread with the enucleated fibroids was pulled into the vaginal cavity, and the fibroids were extracted transvaginally. Subsequently, the vaginal cuff was sutured.

The operating time in this study was defined as the time from the initial coagulation of the round ligament to the last vaginal