

Original Article

Laparoscopic Hysterectomy in Case of Uteri Weighing ≥ 1 Kilogram: A Series of 71 Cases and Review of the Literature

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ABSTRACT **Study Objective:** To present our experience with laparoscopic hysterectomy (LH) for uteri weighing 1 kilogram or more and to provide a systematic review of the available English literature.

Design: Retrospective analysis and review of the literature (Canadian Task Force Classification II-2).

Setting: Department of Obstetrics and Gynecology, University of Insubria, Varese, Italy.

Patients: All women in whom LH was attempted at the Department of Obstetrics and Gynecology, University of Insubria for uteri weighing ≥ 1 kg were included in the present study. Demographic characteristics and perioperative details of patients were prospectively recorded in our institutional surgical database. We also performed a systematic review of the English literature to identify studies including at least 1 case of LH for uteri weighing ≥ 1 kg.

Interventions: Hysterectomy for uteri ≥ 1 kg was performed through a total laparoscopic approach with vaginal morcellation of the uterus in the majority of patients and transvaginal closure of the vaginal vault in all cases.

Measurements and Main Results: LH was attempted in a total of 71 women. The median uterine weight was 1120 g (1000–2860 g). Three (4.2%) conversions to open surgery were needed. The median operative time and blood loss were 120 minutes (55–360 minutes) and 200 mL (10–1000 mL), respectively. No intraoperative and 2 (2.8%) postoperative complications occurred. Our review identified 6 studies reporting details of LH for uteri weighing ≥ 1 kg for a total of 62 patients; conversion to open surgery was necessary in 6 (9.7%) patients, and an additional 13 (21%) received a minilaparotomic incision to extract the uterus. The overall complication rate reported in the literature was 11.4%.

Conclusion: LH represents a possibility even in cases of uteri weighing ≥ 1 kg. In a dedicated setting with high endoscopic experience, conversion and complication rates appear acceptable. *Journal of Minimally Invasive Gynecology* (2014) 21, 460–465 © 2014 AAGL. All rights reserved.

Keywords: Fibroids; Hysterectomy; Laparoscopy; Large uterus; Total laparoscopic hysterectomy; 1 kg; 1000 g

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The removal of an extremely large uterus represents a challenge to the surgeon regardless of the surgical approach and technique used. Giant myomas obstruct the pelvis and make the uterus extremely difficult to mobilize and manipu-

late, thus reducing the possibility to visualize the surrounding anatomic structures and partially or totally impairing the surgeon's ability to correctly develop the spaces.

There are no clear guidelines about large uteri, and the literature is vague regarding the best surgical option in these cases. Indeed, the likelihood of dealing with giant myomas for the average practitioner is generally low. Nevertheless, this occurrence cannot be considered as negligible. In a large series describing our experience with more than 1500 hysterectomies, the prevalence of uteri ≥ 1 kg was 5.7% [1]. Although this percentage could be overestimated because of the fact that our institution represents the referral center

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in our geographic area, we believe that it is time to provide better insight in the optimal management of these cases.

The use of an exclusively vaginal approach to remove uteri weighing >1 kg has been sporadically described in case reports or small series and is still far away from being represented as a routine possibility for a large-scale clinical setting [2,3]. Laparoscopy has been used in some cases as an assistance to vaginal surgery for very large uteri [4,5], whereas the use of a total laparoscopic approach for uteri weighing ≥ 1 kg has been limited to a very small number of studies [6–11]. It is still commonly accepted that in everyday practice when the fundus of the uterus approaches the umbilicus, the treatment of choice is open abdominal hysterectomy almost worldwide.

After having introduced total laparoscopic hysterectomy (TLH) at our institution in 2000, we proceeded gradually in the implementation of endoscopy for increasingly enlarged indications [1]. We then approached more and more difficult cases through the years and started to perform TLH in patients with an extremely large uterus. The aim of the present study was to describe our technique for performing laparoscopic hysterectomy for uteri weighing ≥ 1 kg and to investigate the perioperative outcomes of this type of operation in a series of 71 women. Moreover, we performed a systematic review of the available literature to identify studies describing the total laparoscopic approach for uteri of 1000 g or more.

Materials and Methods

Data about all consecutive women who undergo hysterectomy for benign indication at the Department of Obstetrics and Gynecology of the University of Insubria (Varese, Italy) are prospectively collected in our surgical database. This database is a research-quality computerized data set, which is maintained by trained residents and updated on a regular basis. It contains detailed information about patients, including parity, body mass index, previous abdominal surgery, indication for hysterectomy, surgical procedure, operative parameters (such as operative time, estimated blood loss, and need for conversion to open surgery), uterine weight, pre- and postoperative hemoglobin, intraoperative complications, and hospital stay. Postoperative complications, readmissions, and reoperations were also registered.

For the purposes of the present study, the database was queried to identify all women with a uterus weighing ≥ 1 kg in whom laparoscopic hysterectomy was attempted between 2000 (the time of introduction of laparoscopic hysterectomy at our department) and July 2013. Those patients who were elected since the beginning for open abdominal approach were excluded from the present analysis. A portion of the women involved in the present study were included in a previous publication by our group [1].

All women gave their written consent for the surgical procedures and the use of personal information for research purposes. Institutional review board approval was obtained.

The decision as to whether or not the laparoscopic approach would be attempted was left to the sole discretion of the surgeon after adequate counseling to the woman regarding the expected benefits and the possible complications of the endoscopic technique. Preoperatively, all women underwent routine assessment including physical examination, Papanicolaou test, and pelvic ultrasound scan; diagnostic hysteroscopy was scheduled in all patients complaining of abnormal uterine bleeding.

Women received a single dose of prophylactic antibiotic 1 hour before the intervention; antithrombotic prophylaxis was administered with low-molecular-weight heparin (7 days) and compression stockings (until full mobilization). All surgical procedures were performed by operators with extensive laparoscopic experience. During the study period, there were no substantial differences in patient care, surgeon staff, and surgical techniques.

Follow-up evaluations with vaginal inspection and ultrasound examination were performed from 1 to 3 months after surgery by the same group of physicians. Most patients received annual checks afterward.

Operative Technique

Our technique for TLH in cases of large uteri follows the usual steps that we accomplish for a standard TLH [12,13]. A RUMI uterine manipulator with a Koh cup colpotomizer (Koh Colpotomizer System; Cooper Surgical, Trumbull, CT) is introduced transvaginally at the beginning of the procedure. Cranial pushing of the manipulator by the third surgeon allows delineation of the vaginal fornices by the Koh cup during the entire operation with concomitant lateralization of the ureters. In cases of very narrow vaginas, we substitute the uterine manipulator with a transvaginal extraction trocar (Karl Storz Endoskope, Tuttlingen, Germany), which has a balloon-shaped vaginal extremity, to obtain the same effect of the Koh cup. We always use a 4-port standard technique consisting of a 5- or 3-mm umbilical port and three 5- or 3-mm ancillary trocars inserted suprapubically (1 in the midline and 2 laterally to the epigastric arteries in the left and right lower abdominal quadrants). We never place our optical trocar supraumbilically nor do we move our ancillary trocars upper on the abdominal wall. In case of a uterus with a fundus over the transverse umbilical line, we sometimes place the optical camera in 1 of the suprapubic ancillary trocars, and the umbilical access is used as an operative port during the detachment of the adnexa or the tubes.

We start with coagulation and section of the round ligament and opening of the broad ligament. We then incise the anterior leaf of the broad ligament. The uterovesical fold is developed, and the bladder is detached from the uterus. In cases of concomitant bilateral adnexectomy, the suspensory ligament is coagulated and sectioned. If the ovaries are preserved, we always remove the tubes, coagulating and sectioning the mesosalpinx and the utero-ovarian ligament.

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