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Comparison of Total Laparoscopic Hysterectomy with Abdominal Total Hysterectomy in Patients with Benign Disease: A Retrospective Cohort Study

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ABSTRACT

Background The present study aimed to determine whether total laparoscopic hysterectomy (TLH) is being implemented safely and appropriately compared with abdominal total hysterectomy (ATH) in our hospital.

Methods We retrospectively reviewed clinical records of 102 patients who underwent total hysterectomy for benign gynecological disease at Japanese Red Cross Yamaguchi Hospital from January 2017 to August 2018. We examined periods of hospital stay, operation time, blood loss, weight of the uterus, frequency of perioperative complications, and the duration from the first visit to the date of surgery. $P < 0.05$ was considered to be statistically significant indicated statistical significance.

Results TLH and ATH were performed in 55 (53%) and 47 (46%) cases, respectively. The TLH group had significantly longer total operation time [133 (82–205) min vs. 87 (57–155) min, $P < 0.0001$], lesser blood loss [5 (5–35) g vs. 100 (10–820) g, $P < 0.0001$], shorter hospital stay [7 (5–14) days vs. 10 (9–26) days, $P < 0.0001$], and lighter uterine weight [206 (27–658) g vs. 554 (79–2284) g, $P < 0.0001$] than the ATH group. The frequency of perioperative complications did not differ between the two groups (3.5% vs. 8.0%, $P = 0.4103$).

Conclusion TLH had a longer operation time and a lesser excised uterine weight, but it had less intraoperative blood loss, shorter hospital stay, and no difference in perioperative complication frequency when compared with ATH.

Key words abdominal total hysterectomy; comparison; total laparoscopic hysterectomy

Recently, the number of total laparoscopic hysterectomy (TLH) performed at our hospital has been on the rise. TLH has been performed on the same patients who had previously undergone abdominal total hysterectomy (ATH), and in total hysterectomy, the rate of TLH was higher than that of ATH. TLH has less blood loss than ATH, requires a small incision, reduces postoperative pain, and is superior in esthetics; thus, it can shorten hospital stay and allow patients a quicker return to normal life. TLH is largely beneficial to patients' quality of life.[1–4] Meanwhile, laparoscopic surgery is inferior to laparotomy because the visual field and the uterine traction are limited and the operation tends to be time-consuming. Perioperative complications such as ureteral injury and bladder injury have been extensively studied.[5, 6] In this study, we aimed to examine whether TLH is being implemented safely and appropriately compared with ATH in our hospital.

MATERIALS AND METHODS

We retrospectively reviewed clinical records of 102 patients who underwent total hysterectomy for benign uterine disease, endometrial hyperplasia, and cervical dysplasia at Japanese Red Cross Yamaguchi Hospital from January 2017 to August 2018. The cases were divided into two groups; namely, TLH and ATH groups. We examined the hospital stay length, operation time, blood loss, uterine weight, perioperative complication frequency, and the duration from the first visit to the date of surgery. Perioperative complications included Clavien–Dindo class II or higher. The procedure of TLH at this hospital is discussed subsequently. A 12-mm camera port is placed in the umbilicus by employing the open method, and a diamond-type port arrangement is used in which an operation trocar is inserted by 3 cm at the midpoint of the inner left and right anterior iliac spines. The surgeon stands on the left side of the patient, the first assistant stands on the right side and operates the camera, and the second assistant performs vaginal operation. Uterine Manipulator Total® is inserted during vaginal operation. In the case of giant uterine fibroids, gonadotropin-releasing hormone agonist (GnRHa) is administered 4–6 times preoperatively. Parameters

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Abbreviations: ATH, abdominal total hysterectomy; GnRHa, Gonadotropin releasing hormone agonist; TLH, total laparoscopic hysterectomy

Table 1. Patients' characteristics

	ATH (n = 47)	TLH (n = 55)	P-value
Years	46 (40–77)	48 (39–81)	0.1147
Body mass index	21.9 (16.1–33.5)	21.4 (16.0–31.6)	1.0000
History of abdominal surgery	42.5% (20/47)	36.3% (20/55)	0.6892

Data are presented as median (range) or percentages (ratio).

Table 2. Diagnosis

Diagnosis	ATH	TLH
Myoma	39	39
Adenomyosis	6	3
Endometrial polyp	1	2
Cervical dysplasia	–	5
Endometrial hyperplasia	–	4
Pelvic infection	1	1
Uterine prolapse	–	1

between procedures were compared using Mann–Whitney U test, and complication rates were compared using Fisher's test. Moreover, $P < 0.05$ was considered to be statistically significant. Written informed consent was obtained from each participant. The study was approved by the institutional review board of Japanese Red Cross Yamaguchi Hospital (approval number H30-17).

RESULTS

TLH and ATH were performed in 55 (53%) and 47 (46%) cases, respectively. Median age was 48 (39–81) and 46 (40–77) years, median BMI was 21.4 (16.0–31.6) and 21.9 (16.1–33.5) kg/m^2, and past abdominal surgery was observed in 36.3% (20/55) and 42.5% (20/47) for TLH group and ATH group, respectively. No significant difference was found in patients' characteristics (Table 1).

Regarding postoperative diagnosis, 78 patients had uterine fibroids, 9 had adenomyosis, 3 had endometrial polyps, 5 had cervical dysplasia, 4 had endometrial hyperplasia, 2 had intrapelvic infection, 1 had cervical cystic mass, and 1 had uterine prolapse (Table 2).

The TLH group had a significantly longer total operation time [133 (82–205) min vs. 87 (57–155) min, $P < 0.0001$] (Fig. 1), less blood loss [5 (5–350) g vs. 100 (10–820) g, $P < 0.0001$] (Fig. 2), and shorter hospital stay [7 (5–14) days vs. 10 (9–26) days, $P < 0.0001$] (Fig. 3). Meanwhile, six cases in the ATH group had intraoperative hemorrhage exceeding 400 mL. No cases

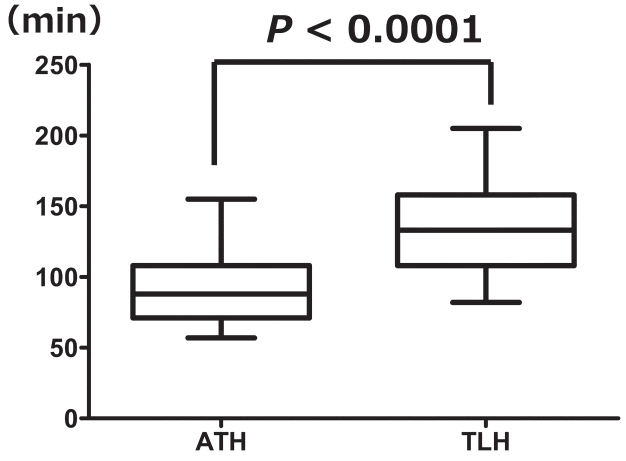

Fig. 1. Distribution of operation time. Operation time was significantly longer in the TLH group ($P < 0.0001$) than that in the ATH group.

of open conversion occurred during surgery. Uterine weight was significantly lighter in the TLH group [206 (27–658) g vs. 554 (79–2284] g, $P < 0.0001$] than that in the ATH group (Fig. 4). The frequency of perioperative complications did not differ between the two groups (3.5% vs. 8.0%, $P = 0.4103$) (Fig. 5). Complications of ATH included neurogenic bladder, ureteral injury, paralytic ileus, and vaginal cuff abscess, whereas those of TLH included vaginal cuff opening, which required suture, and cuff hematoma. Moreover, GnRHa was administered to a higher number of patients in the TLH group (49.1% vs. 27.7%, $P = 0.04$) than that in the ATH group (Fig. 6), but no difference was observed in the preoperative intervention period ($P = 0.1452$) (Fig. 7). Each of them was seen in one case.

DISCUSSION

In our study, TLH was found to have a longer operation time, a smaller excision, and lighter uterine weight than ATH, but it had less intraoperative blood loss, a shorter hospital stay, and no difference in perioperative complication frequency. In addition, no difference was found in the preoperative intervention periods.

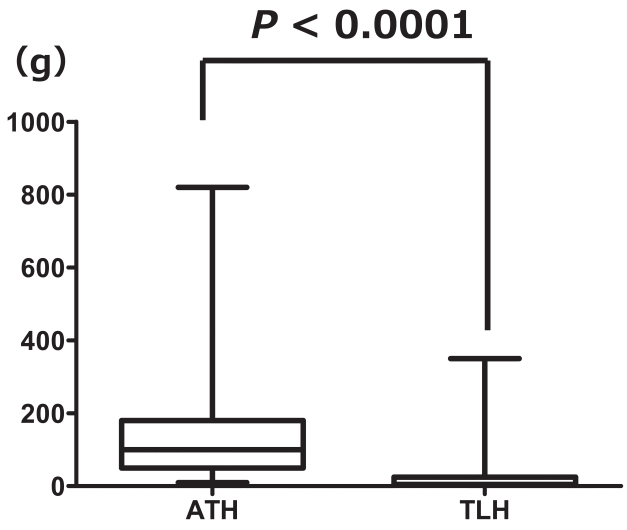

Fig. 2. Distribution of intraoperative blood loss. Blood loss was significantly lower in the TLH group ($P < 0.0001$) than that in the ATH group.

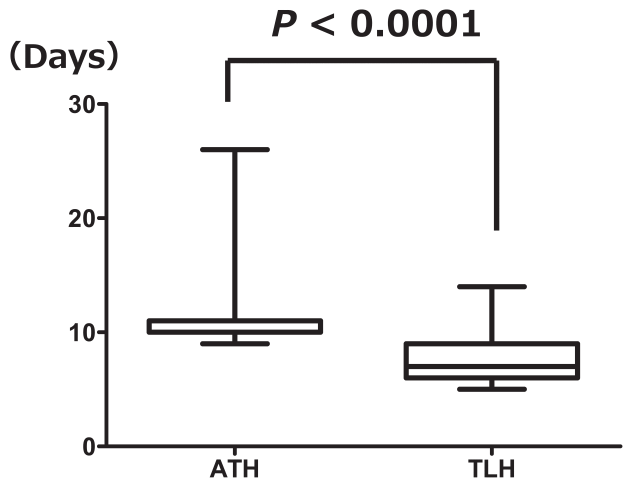

Fig. 3. Distribution of the length of hospital stay. Hospital stay was significantly shorter in the TLH group ($P < 0.0001$) than that in the ATH group.

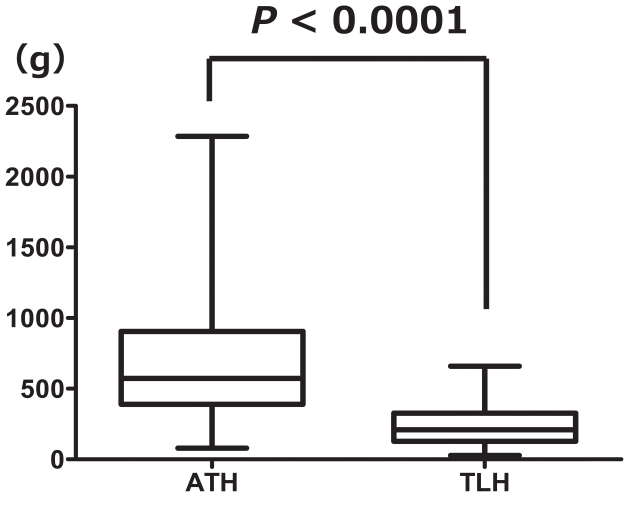

Fig. 4. Distribution of the weight of the removed uterus. Uterine weight was significantly lighter in the TLH group ($P < 0.0001$) than that in the ATH group.

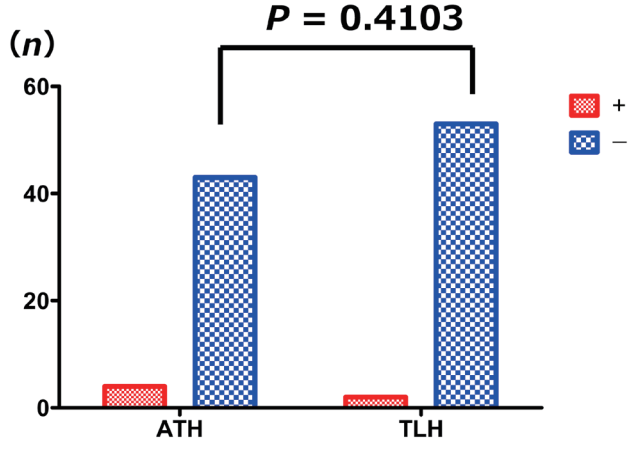

Fig. 5. Comparison of perioperative complication frequency. The frequency of perioperative complications was 8.0% in TLH group and 3.5% in ATH group. No significant difference was found between the two groups ($P = 0.4103$).

Hysterectomy for uterine myoma and adenomyosis has been diversified, and options have increased since Reich et al. reported laparoscopic hysterectomy in 1989.[7] According to a questionnaire survey by the Japan Society for Endoscopic Surgery, the number of laparoscopic surgery for uterine and adnexa diseases increased by approximately 8 times from 2000 to 2017, and the number of TLH increased by approximately 1.7 times from 2014 to 2016.[8] In our hospital, the number of laparoscopic surgeries has also increased. Compared with ATH, TLH has the advantages of reduced blood loss, shorter hospital stay, reduced hemoglobin, and decreased postoperative pain.[1–4] However, identifying the anatomy in the pelvis during TLH is difficult, thereby prolonging the operation time and requiring more attention to complications, such as intraoperative bladder and ureteral injury, than ATH.[5, 6] Meanwhile, in TLH minor complications have decreased while serious complications have increased.[9]

In our study, intraoperative blood loss was less in TLH. The reason is that having an enlarged visual field can easily check for bleeding points and microvessels. Furthermore, decreased blood loss in TLH may be associated with the active use of powered devices, such as

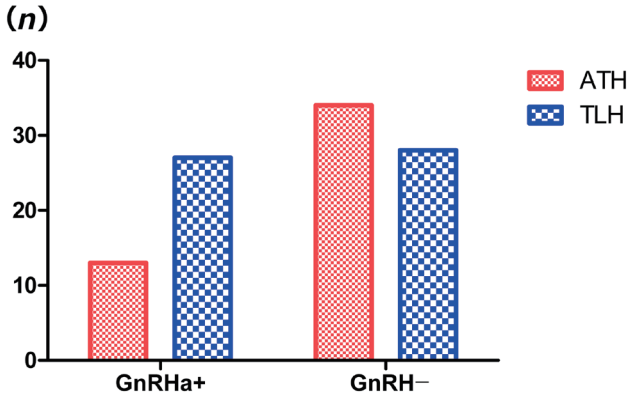

Fig. 6. Comparison of the number of patients who received preoperative GnRHa. GnRHa was administered to more number of patients in TLH group than those in the ATH group (49.1% vs. 27.7%, $P = 0.04$), but no difference was observed in the preoperative intervention period ($P = 0.1452$).

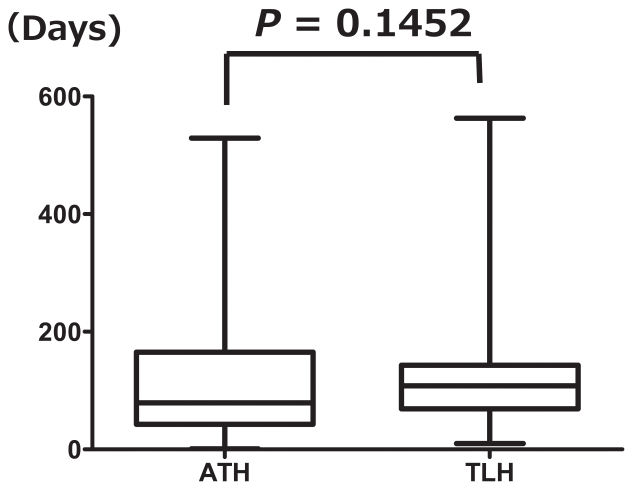

Fig. 7. Distribution of the preoperative period. The period from the first visit to the date of surgery was compared. No significant difference was found between the two groups ($P = 0.1452$).

the ultrasonic coagulation cutting device.[10] The length of hospital stay in TLH is short. The reason is that TLH requires only a small skin incision, thereby resulting in reduced postoperative pain and minimal blood loss; consequently, patients can quickly resume the postoperative activities of daily living. Moreover, the total operation time in TLH was significantly longer than that in ATH, given that careful performance of hemostasis treatment using an enlarged visual field and that of the transvaginal uterine procedure are time consuming. In the future, shortening of the operation time can be expected along with improvement of the technique of the operator.

Komatsu et al. reported that the procedures that greatly affect the operation time are ureteral identification and uterine artery processing on the learning curve of TLH.[11] With regard to the low uterine weight, an improvement in the results due to the technical improvement is expected.

The frequency of perioperative complications tended to be low in the TLH group, but no significant difference was found between the two groups. However, our results conform to the questionnaire survey of Japan Society for Endoscopic Surgery.[8] As for complications related to postoperative vaginal cuff, one case had hematoma in the TLH group, whereas one case had vaginal cuff dissection and another case had vaginal cuff abscess in the ATH group.

Although acquiring suturing skills in laparoscopic surgery is time-consuming, the results will be equivalent or better with the development of technology and surgical instruments. No urinary tract injury was seen in TLH. Although TLH can be performed even in cases with large uterine weight, perioperative outcomes are still poorly reported.[12] Hence, further studies are needed in cases with large uterine weight and cases with strong adhesions.

The limitation of this study is that it is a retrospective cohort study, and patients' characteristics were different (especially, diagnosis, uterine size, and frequency of GnRHa administration). Next, operative method and preoperative management are not unified. When to perform hysterectomy, whether to administer GnRHa or not, or whether to choose ATH or TLH, lies on the discretion of the outpatient physician. In addition, TLH is often selected for cases such as cervical dysplasia and endometrial hyperplasia, with low uterine weight in preoperative evaluation, and this procedure may contribute to a reduction in complications and blood loss.

TLH had less blood loss and shorter hospital stay than ATH. No difference was found in the frequency of perioperative complications between the two groups, and TLH could contribute to patients' quality of life. In TLH, the operation time was longer, and the weight of the uterus was less in comparison with those in ATH. However, we believe that cases indicative for TLH can be expanded as the skills of the surgeon improve.

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The authors declare no conflict of interest.

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