ELSEVIER

JMIG The Journal of Minimally Invasive Gynecology

Original Article

Comparison of 2 Methods of Vaginal Cuff Closure at Laparoscopic Hysterectomy and Their Effect on Female Sexual Function and Vaginal Length: A Randomized Clinical Study

Ercan Bastu, MD*, Cenk Yasa, MD, Ozlem Dural, MD, Bahar Yuksel Ozgor, MD, Gamze Yilmaz, MD, Funda Gungor Ugurlucan, MD, Faruk Buyru, MD, and Saikat Banerjee, MD

From the Department of Obstetrics and Gynecology, Istanbul University School of Medicine, Istanbul, Turkey (Drs. Bastu, Yasa, Dural, Ozgor, Yilmaz, Ugurlucan, and Buyru), School of Health and Social Care (Dr. Bastu), and PostGraduate Medical School (Dr. Banerjee), Faculty of Health and Medical Sciences, University of Surrey, Guildford, Surrey, UK.

ABSTRACT **Study Objective:** To compare the effects of the laparoscopic approach versus the vaginal route for the management of vaginal cuff closure during total laparoscopic hysterectomy on female sexual function in premenopausal patients with benign gynecologic conditions.

Design: A prospective study with a randomized, double-blind design (Canadian Task Force Classification I).

Setting: A university hospital.

Patients: Patients who were scheduled to have total laparoscopic hysterectomy because of benign conditions.

Interventions: Patients were randomized to vaginal cuff closure via the vaginal route versus the laparoscopic approach. The study included a total of 70 patients; 34 underwent the laparoscopic approach in the management of vaginal cuff closure, and 36 underwent the vaginal route.

Measurements and Main Results: Female sexual function and vaginal length were measured. The duration of total surgery was significantly shorter in the laparoscopic approach group compared with the vaginal route group (112.2 ± 36.5 vs 122.7 ± 53.6, $p < .05$). The total Female Sexual Function Index scores preoperatively and 3 months postoperatively were similar between the laparoscopic approach and vaginal route groups (all $p > .05$). Vaginal lengths 3 months postoperatively were significantly longer in the laparoscopic approach group compared with the vaginal route group (8.39 ± 0.90 vs 7.34 ± 1.17, $p < .05$). The duration of cuff closure was significantly shorter in the vaginal route group compared with the laparoscopic approach group (8.92 ± 2.23 vs 7.51 ± 2.5, $p < .05$). Preoperative vaginal lengths were significantly longer in comparison with 3 months postoperatively both in the laparoscopic approach and the vaginal route groups (all $p < .05$). The preoperative total Female Sexual Function Index scores were significantly higher in comparison with 3 months postoperatively both in the laparoscopic approach and the vaginal route groups (all $p < .05$).

Conclusion: The results of this study indicate that the laparoscopic approach for vaginal cuff closure might be preferable because of better postoperative vaginal length and a shorter duration of total surgery time. Journal of Minimally Invasive Gynecology (2016) 23, 986–993

Keywords: Female sexual function; Laparoscopic hysterectomy; Vaginal cuff closure

Hysterectomy, which can be defined as surgical removal of the uterus, is 1 of the most common gynecologic operations around the world. As laparoscopy has spread worldwide and has been used by various surgeons in different fields of medicine, more gynecologic surgeons are now offering laparoscopic hysterectomy as an option to patients. Vaginal cuff closure during hysterectomy has undergone a great variation in technique throughout the history of gynecologic surgery (i.e., laparoscopic single-layer suturing,

The authors declare that they have no conflict of interest.
Supported by the Scientific Research Projects Coordination Unit of Istanbul University (grant no. 48890).
Corresponding author: Ercan Bastu, MD, Department of Obstetrics and Gynecology, Division of Reproductive Endocrinology and Infertility, Istanbul University School of Medicine, Istanbul, Capa 34093.
E-mail: ercan.bastu@istanbul.edu.tr

Submitted May 25, 2016. Accepted for publication July 6, 2016.
Available at www.sciencedirect.com and www.jmig.org

1553-4650/$ - see front matter
http://dx.doi.org/10.1016/j.jmig.2016.07.007

laparoscopic interrupted figure-of-eight suturing, knotted double-layer running suturing, vaginal closure with interrupted suturing, and barbed running suturing).

In recent years, the effects of hysterectomy on female sexual function have become an important research topic. On the other hand, using reproducible and valid methods to assess sexual function remains a challenge. Maybe because of this factor, evidence in the literature on the impact of hysterectomy on female sexual function is variable. Some authors found postoperative improvement in sexual function, whereas others found no impact or worsened sexual function [1–3]. The introduction of validated assessment tools such as the Female Sexual Function Index (FSFI) [4] has enabled researchers to evaluate sexual function in a more standardized manner. Interestingly, although the effects of different types of hysterectomy on female sexuality have been evaluated in the literature, there are no studies on the effects of different types of vaginal cuff closure on sexuality.

The primary aim of this study was to compare the effects of the laparoscopic approach versus the vaginal route for the management of vaginal cuff closure during total laparoscopic hysterectomy on female sexual function in premenopausal patients with benign gynecologic conditions in a reproducible and standardized manner by using the FSFI questionnaire and vaginal length.

Materials and Methods

Study Design

This was a prospective study with a randomized, double-blind design in a university hospital.

Population and Recruitment

All patients referred to the gynecologic surgery division of the Department of Obstetrics and Gynecology at Istanbul University School of Medicine, Istanbul, Turkey, between November 2014 and 2015 who were scheduled to undergo total laparoscopic hysterectomy because of benign conditions were invited to participate in the study during their first visit to the department.

Inclusion criteria were as follows: (1) confirmed premenopausal status in accordance with the World Health Organization criteria [5], (2) indication of laparoscopic hysterectomy because of a benign gynecologic condition, (3) age between 45 and 55 years, and (4) body mass index (BMI) between 18 and 30 kg/m^2.

Exclusion criteria were as follows: (1) suspicion of malignancy, (2) presence of large adnexal masses (maximum diameter $>$10 cm at preoperative ultrasonography), (3) potential need to convert to laparotomy because of perioperative complications such as Clavien-Dindo grade IV or V [6], and (4) potential need for surgical prolapse repair because of 2nd to 4th degree uterine descensus.

All patients underwent preoperative clinical evaluation, ultrasonographic examination to evaluate changes in endometrial lining, and a Papanicolaou smear test to exclude cervical pathology. Baseline demographics were gathered for each patient, which included age, parity, BMI, and surgical history. Two study groups were matched for demographic variables such as age and BMI.

The study was approved by the Ethics Committee of Istanbul University School of Medicine and was registered at ClinicalTrials.gov, a service of the US National Institutes of Health, in accordance with good clinical practice guidelines. The ClinicalTrials.gov identifier is NCT02293369. All recruited patients who met the inclusion criteria were extensively informed, and consent was obtained.

Sample Size

Sample size calculation was performed based on a previously published study that documented a postoperative total vaginal length difference of 1.5 cm in patients who underwent total vaginal hysterectomy compared with patients who underwent total abdominal hysterectomy [7]. Based on these data, we needed 29 patients in each group to reject the null hypothesis regarding the equality of groups with a probability of 80%. The probability of associated type I error for the null hypothesis was 5%.

Intervention

The patients who agreed to participate in the study and signed a consent form were randomized to vaginal cuff closure via the vaginal route versus the laparoscopic approach. We used a computer-generated randomization scheme and sequentially numbered opaque, sealed envelopes containing assignments to allocated groups. The envelopes were opened at the beginning of the surgical procedure. All hysterectomies were performed by 2 staff-attending surgeons (E.B. and C.Y.) who were trained in the same institute and have extensive experience in advanced laparoscopic procedures. All surgeries were performed in the Department of Gynecology of Istanbul University School of Medicine.

One week before surgery, all patients were asked to complete the FSFI. One week was chosen as a time period rather than a few days before the surgery to avoid the stress factor of upcoming surgery. The patients completed the questionnaire alone in a room. The questionnaires were handed out and collected by a nurse (N.I.). Questionnaires stayed in the patient files in closed envelopes until the time of data analysis.

Before opening the envelope that had the randomization information, vaginal length was measured in a standardized fashion by a surgical nurse (M.Y.). First, the patient was put into the lithotomy position under anesthesia. A speculum was then inserted into the vagina. The vaginal length was measured in centimeters by using forceps. The measurement