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Original Article

Vaginal Versus Robotic Hysterectomy and Concomitant Pelvic Support Surgery: A Comparison of Postoperative Vaginal Length and Sexual Function

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ABSTRACT **Study Objective:** To compare the change from pre- to postoperative total vaginal length (TVL) in women who underwent either a total vaginal hysterectomy (TVH) with uterosacral ligament suspension (USLS) or a robotic hysterectomy (RH) with colpopexy (SCP). Secondary objectives included comparing sexual function, pelvic floor function, and prolapse recurrence between routes of surgery.

Design: This was a retrospective cohort study (Canadian Task Force classification II-2).

Setting: This was conducted at 1 tertiary academic medical center over a 2-year period.

Patients: Women who underwent either TVH/USLS or RH/SCP.

Interventions: Baseline and postoperative POP-Q Pelvic Organ Prolapse Quantification exams were recorded as well as postoperative validated questionnaires. Twenty-nine subjects were needed in each group to detect a 1.5-cm difference in TVL.

Measurements and Main Results: There were 38 TVH/USLS and 46 RH/SCP participants. RHs were either total (28/46 [61%]) or supracervical (18/46 [39%]). The mean postoperative follow-up was 9.5 ± 3.1 months. For the primary outcome, women in the TVH/USLS group had a decrease in TVL, whereas women in the RH/SCP group had an increase in TVL (−0.6 ± 1.0 cm vs 0.5 ± 0.8 cm, $p < .001$). Among sexually active women (55/84, 65.5%), there was no difference in postoperative sexual function between groups based on Pelvic Organ Prolapse/Urinary incontinence Sexual Function Questionnaire short form scores, with good sexual function in both groups (32.6 ± 6.2 TVH/USLS vs 35.1 ± 7.3 RH/SCP, $p = .22$). Although both groups showed good postoperative apical support, the TVH/USLS group had a slightly lower mean C point compared with the RH/SCP group (−6.8 ± 1.2 vs −7.7 ± 1.8, $p = .02$). Both groups showed good postoperative pelvic floor function, with no difference in mean postoperative Pelvic Organ Prolapse Distress Inventory scores (42.2 ± 45.4 vs 52.7 ± 46.6, $p = .44$). Recurrent prolapse (defined as any prolapse at or beyond the hymen) was not different between groups (13.2% for TVH/USLS vs 6.5% for RH/SCP, $p = .46$).

Conclusion: Vaginal length decreased after vaginal hysterectomy with pelvic support surgery compared with RH with pelvic support surgery, with no differences in postoperative sexual function or pelvic floor function between groups. Journal of Minimally Invasive Gynecology (2014) 21, 1010–1014 © 2014 AAGL. All rights reserved.

Keywords: Robotic hysterectomy; Sacrocolpopexy; Sexual function; Vaginal hysterectomy; Vaginal length

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Dr. Geller has received honoraria from Intuitive Surgical, Inc for postgraduate courses during the study period.

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Hysterectomy is the most common surgical intervention occurring in the United States in nonpregnant women [1]. Pelvic organ prolapse has become a leading reason for women to undergo hysterectomy in the United States, accounting for approximately 15% of hysterectomies [2]. Over the last few years, trends in the route of hysterectomy have changed, with more surgeons adopting laparoscopic and robotic approaches at the cost of vaginal hysterectomy [3,4]. However, the American College of Obstetricians and Gynecologists recommends a vaginal approach for benign hysterectomy when possible because it has clinical benefits including less blood loss, less genitourinary tract injury, quicker return to normal function, and lower cost [1,2]. Despite the benefits of the vaginal route, we have witnessed a decline in the rates of vaginal hysterectomy. A tertiary academic hospital compared routes of hysterectomy in 2000 with those in 2010; laparoscopic hysterectomy increased from 3.3% to 43%, whereas abdominal hysterectomy decreased from 74.5% to 36% and vaginal hysterectomy decreased from 22% to 17% [4].

Although there are many known benefits of vaginal hysterectomy, it is unclear how the route of surgery affects vaginal length and sexual function [5–8]. A prospective study comparing vaginal length between total abdominal hysterectomy (TAH) and total vaginal hysterectomy (TVH) found a decrease in postoperative total vaginal length (TVL) in the TVH group only [6]. There was also a higher rate of postoperative dyspareunia in the TVH group (20% vs 5%, $p < .05$) and those women had the shortest TVL [6]. However, a retrospective study of 1236 women found similar postoperative vaginal lengths when comparing TAH and TVH [7]. A study assessing sexual function in vaginal versus nonvaginal prolapse surgery reported no difference in sexual function between groups, but only some of the subjects underwent hysterectomy at the time of the study, which may confound the results [8]. There are no published studies comparing TVL and sexual function among the minimally invasive routes of hysterectomy (i.e., vaginal vs either laparoscopic or robotic-assisted laparoscopic hysterectomy). Our primary objective was to compare changes in TVL among women who underwent either TVH with uterosacral ligament suspension (USLS) or a robotic hysterectomy (RH) with sacrocolpopexy (SCP). Secondary objectives were to compare postoperative sexual function, pelvic floor function, and prolapse recurrence between groups.

Methods

This was a retrospective cohort study in women who underwent surgery between January 2011 and December 2012 at the Division of Female Pelvic Medicine and Reconstructive Surgery, University of North Carolina at Chapel Hill, Chapel Hill, NC. After institutional review board approval, subjects were identified from an operating room database and included if they underwent either a TVH/USLS or RH/SCP during the study period and had both a baseline preoperative examination and a postoperative examination at least 3 months after surgery.

Baseline demographic information was obtained including age, parity, tobacco use, and past surgical procedures. Postoperative condition-specific validated quality of life questionnaires were also collected including Pelvic Organ Prolapse/Urinary incontinence Sexual Function Questionnaire short form (PISQ-12), Pelvic Organ Prolapse Distress Inventory short form (PFDI-20), and Pelvic Floor Impact Questionnaires short form. We defined postoperative dyspareunia as an answered response of "usually" or "always" to question #5 in the PISQ-12, "do you feel pain during intercourse?" Concomitant prolapse or incontinence procedures were noted and were not reason for exclusion. If subjects had not completed postoperative quality of life questionnaires at their postoperative visit, they were contacted and completed the questionnaires over the telephone.

Sample size was calculated based on prior published data showing a difference in postoperative TVL in TVH versus TAH of 1.5 cm [6]. We required 29 subjects in each group to detect a 1.5-cm difference between groups, with 80% power and alpha of .05.

Statistical analyses were conducted with SPSS version 20.0 (SPSS Inc, Chicago, IL). Student's *t* test was used for continuous data and the chi-square or Fisher exact test for categoric data. Spearman correlation was used when appropriate. Analysis of variance with Tukey subanalysis was used for secondary analysis to compare the 3 hysterectomy groups.

Results

There were 38 TVH/USLS and 46 RH/SCP participants who met the inclusion criteria. In the TVH group, 25 women were excluded from the analysis because they did not have adequate follow-up, whereas no women were excluded from the RH group. RHs were either total (28/46 [61%]) or supracervical (18/46 [39%]). There were no differences in baseline demographics (Table 1). The TVH/USLS group had more concomitant anterior repairs (36.8% vs 4.4%, $p < .01$) and posterior repairs (52.6% vs 30.4%, $p = .04$) with no difference in midurethral sling placement compared with the RH/SCP group (42.1% vs 54.3%, $p = .26$) (Table 2). The mean postoperative follow-up was shorter in the TVH/USLS group (5.4 ± 3.1 vs 13.6 ± 3.0 months, $p < .001$). The length of hospital stay was shorter in the TVH/USLS group (1.0 ± 0.2 vs. 1.6 ± 0.6 days, $p < .01$).

For our primary outcome, postoperative TVL was noted to decrease in the TVH/USLS group and was noted to increase in the RH/SCP group when compared with baseline TVL (-0.6 ± 1.0 cm vs 0.5 ± 0.8 cm, $p < .001$) (Table 3). Postoperative TVL in the TVH/USLS group compared with the RH/SCP group was 7.7 ± 1.2 versus 9.1 ± 1.0 ($p < .01$), with no differences noted in preoperative TVL between the groups (8.3 ± 1.2 vs 8.6 ± 1.1,