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Minimally Invasive Hysterectomies—A Survey on Attitudes and Barriers among Practicing Gynecologists

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Abstract

Study Objective—To explore attitudes and hysterectomy practices among gynecologists in the United States and to identify potential barriers to offering minimally invasive hysterectomies.

Design—Mixed-mode (online and on-paper) survey of a random sample of 1500 practicing obstetrician-gynecologists.

Setting—Nationwide survey in the United States.

Participants—Nonretired obstetrician-gynecologists identified through a physician list from the American Medical Association.

Interventions—Postal and online survey.

Measurements & Main Results—We received a response from 376 physicians (25.8% response rate). The average age of respondents was 47.9 years, and 87% were generalists. Participants performed on average 4 surgical cases per week and 32 hysterectomies per year, most of which were abdominal hysterectomies. When asked for preferred mode of access for themselves or their spouse, 55.5% chose vaginal hysterectomy (VH), 40.6% chose laparoscopic hysterectomy (LH), and 8% chose abdominal hysterectomy (AH). Younger physicians (<40) and high surgical volume physicians were significantly more likely to chose a laparoscopic approach and identified significantly fewer barriers for performing LH. The main barriers to performing VH were technical difficulty, potential for complications, and caseload of VH. The main barriers for performing LH were training during residency, technical difficulty, personal surgical experience and operating time. The majority of gynecologists wanted to decrease their AH rates and increase their LH rates. The most significant identified contraindications to VH were prior laparotomy, a uterus larger than 12 weeks, narrow introitus, adnexal mass, and minimal uterine descent.

Conclusions—While a large majority of gynecologists would prefer a VH or LH for themselves or their spouse, AH remains the most common hysterectomy method in the United States. A generation gap appears to be brewing with younger gynecologist more in favor of the laparoscopic

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Editor's Comment: Usually the journal does not publish survey data with low response rates. But the continued disconnect between preference and practice demanded dissemination of these data. Residency programs in the United States continue to provide inadequate training and experience in laparoscopic and vaginal approaches to hysterectomy.

approach. More emphasis should be placed on training gynecologists in performing minimally invasive hysterectomies, given their desire to change their surgical mode of access.

Keywords

Minimally; Invasive; Hysterectomy; Barriers

Hysterectomy is one of the most commonly performed surgical procedures in the United States, with 570 000 cases performed in 2006 [1]. The most common indications include uterine fibroids, abnormal uterine bleeding, and pelvic organ prolapse [2], and approximately 45% of women in the United States above the age of 70 have had a hysterectomy in their lifetime [3].

Abdominal, laparoscopic, and vaginal approaches are appropriate for hysterectomy, and the choice of approach is dictated by patient characteristics, indication for surgery, and surgeon preference. Vaginal and laparoscopic hysterectomies are considered minimally invasive approaches because they are associated with less pain, shorter hospital stay, and a more rapid resumption of normal activity when compared with abdominal hysterectomy [4]. Despite its potential for longer short-term morbidity, abdominal hysterectomy (AH) continues to be the most common surgical approach in the United States [5]. A recent nationwide study found that 66.1% of hysterectomies were performed abdominally, 21.8% vaginally, and 11.8% laparoscopically [5].

Because of this apparent discrepancy, we were interested in exploring the potential provider-related barriers for offering a minimally invasive hysterectomy to their patients. We wanted also to evaluate provider attitudes toward mode of access, as well as inquire about provider perceived contraindications for performing a vaginal (VH) or a laparoscopic hysterectomy (LH). We hypothesized that perceived barriers to and attitudes toward a less-invasive hysterectomy approach would differ on the basis of surgeon volume and time since completion of training.

Materials and Methods

We developed a 2-page anonymous survey that was designed to explore physicians' attitudes and perceived barriers towards minimally invasive hysterectomy. The survey included questions on demographic characteristics, questions regarding preferred approach to hysterectomy, approximate number of surgical cases per year, and a Likert-type ranking of potential barriers and contraindications for performing vaginal and laparoscopic hysterectomies (Addendum 1). Laparoscopically assisted VHs were categorized as LHs in the analysis of the results. The study was reviewed and approved by the Partners Institutional Review Board. We first pilot tested the survey among a sample of 20 local physician volunteers and confirmed clarity and relevance of the questions and complete survey. After this review, minor adjustments to the survey were made. The questionnaire was designed to be brief and easy to read so that physicians would be able to complete it within 5 minutes.

We then identified a random sample of 1500 obstetricians/gynecologists with "active status" through the American Medical Association physician master file. The random sampling was performed by an independent company that is licensed by the American Medical Association to provide these services. We did not influence which physicians were selected for participation, and the selection process from the master file was completely random. In September of 2008, we mailed to these physicians an introductory letter, the questionnaire, and a self-addressed postmarked envelope to facilitate the return of the questionnaire. A

second mailing was sent out 2 weeks after the initial mailing, and concurrently an e-mail was sent to the same group of physicians with a link to an on-line version of the questionnaire. Physicians could either complete the questionnaire on-line or on-paper. A second reminder e-mail was sent out 2 weeks later. The questionnaires were anonymous, no personal identifiers were collected, and informed consent was implied by return of a completed survey. We defined "high-volume vaginal surgeons" as those who performed more than 30% of their hysterectomies vaginally and similarly "high-volume laparoscopic surgeons" were defined as those surgeons who performed more than 30% of their hysterectomies laparoscopically. On the basis of the authors' prior experience, we estimated that about a third of the sample surveyed would be high-volume vaginal or laparoscopic surgeons defined as performing 30% of their surgeries laparoscopically or vaginally. Setting our power at 80% and alpha at 0.05 to detect a difference of 15% between groups of interest (corresponding to OR = 2.0) on various study variables with a 2-sided test, we needed a minimum of 100 high-volume vaginal and 100 high-volume laparoscopic surgeons.

In the survey, we asked physicians to rate the significance of several potential barriers on a level for 1 to 10, with 1 not being a barrier and 10 being the most significant barrier. We then added all barriers for individual physicians for a barrier score, which is essentially the sum of all barriers that were reported by the individual physician.

For our data analyses, we used the Fisher exact test and χ^2 test for categorical variables and Student's t test and Wilcoxon rank sum test as appropriate for continuous variables. Responses left blank were censored. All p values were 2-sided, and those less than .05 were considered to indicate statistical significance.

Results

Of the total 1500 questionnaires that were distributed, 42 were undeliverable, leaving a total study population of 1458 potential respondents. A total of 376 questionnaires were completed and returned, for a study sample response rate of 25.8%. The demographics of the respondents are shown in Table 1. We identified 102 (27.1%) high-volume vaginal surgeons and 141 (37.5%) high-volume laparoscopic surgeons. The most commonly performed hysterectomy procedure that had been performed by the responders in the last year were AH (83.9%), followed by vaginal hysterectomy (VH) (75.8%). When gynecologists were asked to rank which hysterectomy approach they would prefer for themselves or their partner, 55.5% ranked VH as their first choice, 40.6% ranked laparoscopic hysterectomy (LH) as their first choice and only 8% ranked AH as their first choice. These personal preferences data are presented in Table 2. Gynecologists were asked to rank each approach to hysterectomy on a scale of 1 to 6, with "1" being "first choice" and "6" being "last choice." Looking at personal preferences by surgeon volume, compared with lower-volume vaginal surgeons, high-volume vaginal surgeons were more likely to rank VH as a highly preferred method and less likely to rank TLH and LSH as a highly preferred method. Conversely, high-volume laparoscopic surgeons were more likely to rank TLH and LSH highly. Looking at these same data by physician age, when compared with physicians older than 40 years, physicians 40 years or younger were significantly more likely to rank total laparoscopic hysterectomy (mean rank score 2.8 vs 3.4, $p = .001$) and laparoscopic supracervical hysterectomy (mean rank score 3.2 vs 3.9, $p = .0002$) highly and significantly less likely to rank AH (mean rank score 4.6 vs 3.9, $p = .001$) and supracervical abdominal hysterectomy (mean rank score 5.3 vs 4.9, $p = .02$) highly.

The main barriers to performing VH and LH are listed in Table 3. Gynecologists were asked to rank each factor on a scale of 1 to 10, with "1" being "not a barrier" and 10 being "most significant barrier". The most commonly reported barriers for VH were technical difficulty,

potential for complications, and personal caseload of vaginal hysterectomies. The most commonly reported barriers for LH were training during residency, technical difficulty, personal surgical experience, and operating time.

Surgeons who performed fewer than 6 cases per week were found to have a significantly higher barrier score (all barriers added together) to performing LH than surgeons who performed fewer than 6 cases per week (total barriers 46.2 vs 37.2, $p = .03$). Furthermore, physicians younger than 40 reported a significantly lower barrier score to LH than older surgeons (40.3 vs 46.8, $p = .04$).

Surgeons who performed on average fewer than 2 hysterectomies per month were found to have a significantly higher barrier score for vaginal hysterectomy (48.7 vs 33.8, $p = .04$) and laparoscopic hysterectomy (68.3 vs 43.9, $p = .03$). High-volume laparoscopic surgeons were found to be significantly younger and with significantly fewer years in practice (data not shown).

In Table 4, we present desired mode of access for hysterectomy. In our survey, physicians responded that they would like to decrease their AH and supracervical abdominal hysterectomy rates, whereas more than 50% would like to increase their TLH rates. When asked about their ideal goal for mode of access for hysterectomy, gynecologists on average believed that 78.8% of hysterectomies should ideally be performed by a minimally invasive approach, with 40.1% of hysterectomies performed vaginally and 38.7% laparoscopically.

The most commonly cited contraindications to performing vaginal hysterectomy were adnexal mass (75.3%), uterus larger than 16 weeks (72.7%), minimal uterine descent (63.3%), and a narrow vaginal introitus (58.1%) (Table 5). The most commonly cited contraindications to performing laparoscopic hysterectomy were uterus larger than 16 weeks (40.0%), adnexal mass (12.5%), narrow vaginal introitus (11.1%), and history of endometriosis (10.8%). When these data were broken down to compare high-volume with lower-volume surgeons (Table 5), we found that, compared with lower-volume vaginal surgeons, high-volume vaginal surgeons were less likely to report prior exploratory laparotomy, history of endometriosis, uterus larger than 12 weeks, and narrow introitus as a contraindication. Similarly, high-volume laparoscopic surgeons were less likely to consider many factors as contraindication to the laparoscopic approach (Table 5). Nevertheless, even among high-volume vaginal surgeons, history of endometriosis, history of pelvic inflammatory disease, uterus larger than 16 weeks, narrow introitus, minimal descent, and adnexal mass were considered contraindications to a vaginal approach. The most commonly reported contraindications to LH among high-volume laparoscopic surgeons were uterus larger than 16 weeks, narrow introitus, and adnexal mass.

When asked about hysterectomy alternatives, most gynecologists in practice responded that they offered their patients a variety of hysterectomy alternatives, including endometrial ablation (96%), myomectomy (76%), uterine artery embolization (64%), and the progesterone intrauterine device (90%).

Discussion

In our survey, we found large discrepancies between physician practice patterns and physician preferences for approach to hysterectomy. Although 8% of gynecologists in practice would choose AH as the preferred hysterectomy approach for themselves or their spouse, AH continues to be the most common hysterectomy method in the United States. This disconnect between preference and practice could present an ethical dilemma for gynecologists if they are not able to offer potentially appropriate candidates the hysterectomy they would prefer for themselves or their spouse. This seems consistent with

our finding that study participants expressed a strong desire to further incorporate minimally invasive hysterectomies into their practice.

Hysterectomy is the second most common surgical procedure performed on women in the United States [2]. Identifying ways to promote the least invasive approach to hysterectomy and the utilization of reasonable hysterectomy alternatives could decrease health care costs and improve patient quality of life [6,7]. However, a number of important barriers to providing less-invasive approaches were identified through this survey. Technical difficulty and potential for complications were most often reported as the main barriers for both VH and LH, and surgical volume a barrier for LH. Surgical volume and surgical experience in minimally invasive surgery appear to be important practice pattern modifiers and predictors. In our study we found that surgeons with a higher volume of surgery overall and a higher volume of minimally invasive hysterectomies specifically appear to identify fewer barriers to performing minimally invasive hysterectomies. This can be translated into higher-volume surgeons being more likely to offer minimally invasive surgical options to their patients. Once physicians are performing more than 30% of their hysterectomies either vaginally or laparoscopically, their barriers and contraindications toward these approaches appear to be significantly decreased.

The survey also highlights a significant relationship between the age of practicing gynecologists and both attitudes toward less-invasive hysterectomy approaches and hysterectomy practice patterns. It is likely that younger gynecologists have had more exposure toward LHs than their older colleagues, because LHs have slowly been incorporated into clinical practice over the past 20 years [4]. In a survey among graduating obstetrics/gynecology residents in 2001, most did not feel comfortable performing advanced laparoscopic procedures, including hysterectomy [8]. However, in a follow-up survey conducted in 2008, there was a significant increase in perceived competencies among graduating obstetrics/gynecology residents in advanced minimally invasive surgical techniques (article in press). The fact that a majority (77.4%) of gynecologists would like to increase their ability to offer less-invasive hysterectomy approaches suggests that, if more opportunities for LH exposure and training were available, more interested gynecologists potentially could become comfortable offering this option to their patients.

Although this is the first survey to evaluate barriers to performing minimally invasive hysterectomies in the United States, surveys on attitudes toward hysterectomy have been performed in Sweden [9], Denmark [10], and Australia [11] with varying results. Danish gynecologists in 2002 appeared to most commonly prefer an abdominal supracervical hysterectomy given 7 clinical scenarios [10], whereas Swedish gynecologists were more likely to prefer the vaginal approach for a small uterus and the abdominal approach for a large uterus [9]. An Australian survey found that the most significant barriers to offering a laparoscopic hysterectomy were insufficient training and experience, lack of hospital equipment and lack of support from colleagues. A recent U.S. survey designed to evaluate potential effects of gender in offering hysterectomy found no significant differences in hysterectomy practices among male and female gynecologists [12].

Our study has both strengths and limitations. One strength is that data were obtained from a random national sample of gynecologists. Additionally, although other countries have evaluated physician's preferences for hysterectomy approach [9–11], this is the first survey to evaluate barriers to performing minimally invasive hysterectomies in the United States. A limitation of our study was its low response rate of 25.8%. Prior studies have found that survey response rates among obstetrics/gynecology physicians can be low even in the setting of a monetary incentive [13]. We aimed to get at least a 50% response rate and used several strategies that have been found to maximize response rates, such as repeated mailings,

personalized mailings, a short questionnaire, and a questionnaire that was pretested for readability [14]. Although monetary incentives have been shown to improve response rates, we were unable to use this strategy for this study. Because of the low response rate, it is possible that the physicians who chose to respond to our survey may not be representative of the overall pool of gynecologists in practice, which affects the generalizability of our results. It is possible that physicians who were more interested in minimally invasive gynecologic procedures may have been more likely to respond to our survey. Although nonresponse bias may have affected our results, we did obtain responses from a large number of physicians who were low-volume laparoscopic and vaginal surgeons and the proportion of high-volume surgeons and low-volume surgeons was very similar to what was expected a priori on the basis of clinical experience.

The results of our study may have some important implications for future planning and implementation of training among practicing gynecologists. Gynecologists who perform at least 30% of their hysterectomies by a minimally invasive route (VH or LH) perceive fewer barriers to offering these approaches and cite fewer relative contraindications to performing either VH or LH. Physician decision making is a complex process, and several factors including availability of specialists, practice setting, and surgical training all likely affect personal choices and preferences for minimally invasive surgical techniques. It is likely that physicians who perceive fewer barriers to minimally invasive hysterectomy offer it as an option to more patients. Additionally, respondents generally believed that minimally invasive routes were the mode they would choose for themselves or someone close to them, despite the fact that most respondents preferentially perform AH. Last, we found that most gynecologists are interested in increasing the proportion of minimally invasive hysterectomies they perform. These data together suggest that facilitating minimally invasive surgical training and experiences for interested gynecologists in practice could potentially decrease AH rates. Gynecologic surgeons who are interested in incorporating minimally invasive surgical techniques may want to consider their own surgical volume before proceeding with further training. If their surgical volume is low (<6 cases per week or <2 hysterectomies per month), it may be logistically difficult to obtain the necessary skills to move forward because the steepest portion of the learning curve for a LH has generally been considered to be during the first 30 cases [15]. It seems evident that complication rates among inexperienced surgeons are higher than among experienced surgeons [16]; therefore it is important for inexperienced surgeons to identify an experienced mentor who can operate with them in their first few cases. Finally, if a practicing gynecologist has a patient who requires a hysterectomy and the gynecologist does not feel comfortable performing the hysterectomy in a minimally invasive fashion, he or she may want to consider referring the patient to an experienced vaginal or laparoscopic surgeon in their community for consideration of a minimally invasive surgical approach.

Conclusion

Physician preferences for mode of hysterectomy and physician practices appear inconsistent. Gynecologic surgeons who have a high surgical volume are more likely to feel comfortable offering a minimally invasive hysterectomy to their patients. This suggests that more emphasis needs to be placed on training opportunities in minimally invasive surgical approaches to hysterectomy given the desire among practicing gynecologists to change their surgical mode of access.

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Table 1**Demographic information**

Age	47.9 (10.7)
Sex	
Male	168 (46.3%)
Female	195 (53.7%)
Years in practice	16.8 (13.2)
Practice type	
Solo	81 (22.3%)
Single-specialty group	160 (44.0%)
Multi-specialty group	68 (18.7%)
Full time Academic	50 (13.8%)
Other	4 (1.10%)
Training level	
General obstetrics/gynecology	322 (87.0%)
Reproductive endocrinology	5 (1.4%)
Urogynecology	7 (1.9%)
Maternal fetal medicine	13 (3.5%)
Gynecologic oncology	9 (2.4%)
Minimally invasive surgery	12 (3.2%)
Other	2 (0.5%)
Surgical cases per week	4.0 (3.1)
Types of hysterectomy performed in past year	
Total abdominal hysterectomy	307 (83.9%)
Subtotal abdominal hysterectomy	108 (29.6%)
Vaginal hysterectomy	277 (75.8%)
Total laparoscopic hysterectomy	109 (29.8%)
Laparoscopically assisted vaginal hysterectomy	162 (44.4%)
Subtotal laparoscopic hysterectomy	101 (27.5%)
Hysterectomies per year	31.6 (33.2)
Total abdominal hysterectomy	10.4 (16.2)
Subtotal abdominal hysterectomy	1.2 (3.6)
Vaginal hysterectomy	8.2 (12.8)
Total laparoscopic hysterectomy	5.1 (14.7)
Laparoscopically assisted vaginal hysterectomy	4.4 (10.4)
Subtotal laparoscopic hysterectomy	3.7 (12.9)

Data are presented as mean (SD) unless otherwise specified.

Ratings of physician or partner preference for mode of hysterectomy by volume of vaginal hysterectomies and volume of laparoscopic hysterectomies

Table 2

	Vaginal surgeons			Laparoscopic surgeons		
	Overall	<30% (n = 274)	>30% (n = 102)	p	<30% (n = 235)	>30% (n = 141)
VH	1.90 (1.2)	2.2 (1.3)	1.3 (0.7)	<.001	1.7 (1.1)	2.2 (1.3)
LAVH	2.87 (1.2)	2.9 (1.3)	2.9 (1.0)	.49	2.9 (1.3)	2.8 (1.1)
TLH	3.19 (1.6)	3.1 (1.6)	3.5 (1.3)	.006	3.5 (1.5)	2.8 (1.5)
LSH	3.62 (1.7)	3.4 (1.7)	4.1 (1.5)	.004	4.1 (1.6)	3.0 (1.6)
AH	4.10 (1.5)	4.0 (1.6)	4.0 (1.5)	.70	3.7 (1.7)	4.6 (1.1)
SCH	5.05 (1.2)	5.0 (1.2)	5.1 (1.1)	.39	4.8 (1.3)	5.5 (0.7)

1 = first choice, 6 = last choice. Data are presented as mean (SD).

VH, vaginal hysterectomy; LAVH, laparoscopically assisted vaginal hysterectomy; TLH, total laparoscopic hysterectomy; LSH, laparoscopic supracervical hysterectomy; AH, abdominal hysterectomy; SCH, supracervical hysterectomy.

Table 3

Ratings of potential barriers to performing a minimally invasive hysterectomy

	Vaginal	Laparoscopic
Training during residency	2.3 (2.4)	5.0 (3.7)
Operating time	2.3 (2.1)	4.4 (3.0)
Hospital/patient cost	1.7 (1.7)	3.2 (2.7)
Technical difficulty	4.7 (3.0)	4.9 (3.1)
Potential for complications	3.6 (2.8)	4.2 (3.0)
Availability of equipment	2.1 (2.2)	3.6 (3.1)
Reimbursement rates	2.0 (2.1)	2.8 (2.6)
Personal surgical experience	2.7 (2.6)	4.4 (3.4)
Personal patient volume	2.6 (2.7)	2.8 (2.8)
Caseload of VH/LH	2.8 (2.9)	2.5 (2.5)
I teach residents	1.8 (2.0)	1.9 (2.1)
Early return to normal activity	2.2 (2.4)	2.0 (2.2)
Patient satisfaction	2.5 (2.8)	2.1 (2.3)
Malpractice concerns	2.2 (2.1)	2.8 (2.6)

1 = not a barrier, 10 = most significant barrier. Data are presented as mean (SD).

Table 4

Desired change of mode of access for hysterectomy

	Decrease	Stay the same	Increase
Total abdominal hysterectomy	154 (46.5%)	163 (49.2%)	14 (4.2%)
Subtotal abdominal hysterectomy	95 (30.4%)	207 (66.1%)	11 (3.5%)
Vaginal hysterectomy	14 (4.3%)	172 (52.8%)	140 (42.9%)
LAVH	51 (16.1%)	187 (59.0%)	79 (24.9%)
Total laparoscopic hysterectomy	15 (4.8%)	135 (42.7%)	166 (52.5%)
Subtotal laparoscopic hysterectomy	44 (14.0%)	155 (49.2%)	116 (36.8%)

Table 5
Perceived contraindications to performing vaginal and laparoscopic hysterectomies stratified by surgeon volume

	Laparoscopic hysterectomy			Vaginal hysterectomy		
	Overall	<30%	>30%	Overall	<30%	>30%
Prior exploratory laparotomy	57 (16.6%)	49 (20.0%)	8 (8.0%)	20 (5.8%)	18 (8.7%)	2 (1.5%)
Prior cesarean section	49 (14.4%)	43 (18.0%)	6 (6.0%)	14 (4.0%)	14 (6.6%)	0 (0%)
Prior laparoscopy	17 (5.0%)	14 (6.0%)	3 (3.0%)	5 (1.4%)	5 (2.4%)	0 (0%)
History of PID	110 (32.0%)	83 (34.0%)	27 (28.0%)	30 (8.6%)	27 (12.7%)	3 (2.2%)
History of endometriosis	127 (36.9%)	106 (43.0%)	21 (21.0%)	37 (10.8%)	34 (16.4%)	3 (2.2%)
Uterus larger than 12 weeks	73 (21.2%)	61 (24.8%)	12 (12.2%)	24 (7.0%)	21 (10.3%)	3 (2.2%)
Uterus larger than 16 weeks	250 (72.7%)	181 (73.6%)	69 (70.4%)	137 (40.1%)	92 (44.7%)	45 (33.1%)
Narrow introitus	200 (58.1%)	152 (61.8%)	48 (49.0%)	38 (11.1%)	28 (13.5%)	10 (7.4%)
Minimal descent	217 (63.3%)	156 (63.7%)	61 (62.2%)	22 (6.2%)	20 (9.3%)	2 (1.4%)
Adnexal mass	259 (75.3%)	188 (76.4%)	71 (72.5%)	43 (12.5%)	33 (15.9%)	10 (7.4%)
Nulliparity	83 (24.3%)	66 (27.2%)	17 (17.4%)	10 (2.8%)	7 (3.3%)	3 (2.2%)

PID = Pelvic inflammatory disease.

Surgeons who do more than 30% of cases either laparoscopically or vaginally are considered to favor that mode of access.