

Perceived Proficiency in Minimally Invasive Surgery Among Senior Ob/Gyn Residents

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ABSTRACT

Background and Objectives: To assess self-perceived proficiency in minimally invasive surgical procedures among fourth-year Ob/Gyn residents in the United States and to evaluate trends in self-perceived proficiencies by comparing the current survey to a similar survey distributed in 2001.

Methods: A Web-based survey was sent out to all fourth-year residents in accredited obstetrics and gynecology programs in the United States. The residents completed the online survey regarding their perceived proficiency in performing minimally invasive procedures. These results were compared with the results from a similar survey performed in 2001. The residents were also asked about teaching methods and the importance of minimally invasive surgery training during residency.

Results: We received responses from 248 senior residents. Of these, 65.1% thought emphasis on laparoscopic surgery training should be increased or greatly increased, and 97.1% thought laparoscopic skills were important for building a successful practice. Perceived proficiencies in advanced laparoscopic procedures, such as total laparoscopic hysterectomy and supracervical hysterectomy, were significantly higher compared with our results in 2001. Residents also seemed to feel more comfortable performing basic and advanced hysteroscopic procedures. Of respondents, 56.8% felt that a fellowship in minimally invasive surgery would be beneficial to them following graduation.

Conclusion: Senior Ob/Gyn residents seem to feel more comfortable performing advanced laparoscopic procedures at graduation than they did 7 years ago. The majority feels that the emphasis on training in minimally invasive surgery should be increased.

Key Words: Residents, Laparoscopy training, Competency.

INTRODUCTION

As gynecologic surgery continues to evolve, there appears to be an increased emphasis on minimally invasive surgical techniques within this specialty.¹ Residency programs have invested significant resources for equipment and training opportunities; however, the limitation of resident work hours and the ever-increasing body of knowledge create a challenge for residents and program directors to be able to accommodate all this training during the 4-year training period.²

In 2001, we conducted a survey among fourth-year Ob/Gyn residents in which we asked about attitudes toward minimally invasive surgery, teaching methods, and perceived proficiencies in minimally invasive techniques.³ We found that the majority of the residents at that time did not feel comfortable performing most advanced laparoscopic techniques upon graduation. The majority felt that emphasis on laparoscopic surgery training should be increased and that laparoscopic skills were important for building a successful practice.

We were interested in evaluating whether there had been any changes in perceived resident competencies during the span of the last 7 years. During this time period, laparoscopic surgery has become more engrained in the surgical armamentarium of the gynecologist, but at the same time, restrictions on resident duty hours may have had a negative impact on resident surgical experience. Our objectives therefore were to compare perceived proficiency in minimally invasive gynecologic surgery (MIGS) in 2001 and 2008, to compare the availability of various MIGS teaching methods in 2001 and 2008, and to evaluate resident attitudes towards minimally invasive surgery.

MATERIALS AND METHODS

We adopted the same questionnaire that was used in 2001. The questionnaire was anonymous and Web based. We identified accredited Ob/Gyn programs and

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program directors through the Fellowship and Residency Electronic Interactive Database.⁴ Program directors received a cover letter via E-mail and were asked to forward the survey to their fourth-year Ob/Gyn residents. Residents who elected to include their E-mail address were eligible for a drawing of an I-pod Nano. The E-mailing to the program directors was repeated one week later as a reminder. Participants were asked to rank their comfort level when performing a procedure on a Likert scale from 1 to 5 (1=very uncomfortable, 5=very comfortable). For discussion purposes, residents with a mean score >3 were assumed to feel competent in performing that particular procedure.

We used guidelines from the Society for Reproductive Surgeons (SRS)⁵ when classifying laparoscopic procedures as simple (level 1) or advanced (level 2 or 3). Diagnostic laparoscopy, tubal sterilization, and treatment of ectopic pregnancy were classified as simple (level 1); oophorectomy, supracervical hysterectomy, total hysterectomy, laparoscopically assisted vaginal hysterectomy (LAVH), treatment of moderate to severe endometriosis, myomectomy, and the Burch procedure were classified as advanced. Advanced procedures were mostly level 2, except Burch, which is level 3, because it was felt unlikely that residents will become proficient in procedures such as laparoscopic ureteral dissection or pelvic lymphadenectomy during residency. Office hysteroscopy, diagnostic hysteroscopy, and polyp removal were classified as simple hysteroscopic procedures; septum transection and endometrial ablation were classified as advanced.

We compared demographic, educational, and attitudinal information using the chi-square test and mean proficiencies in specific procedures using the Wilcoxon rank-sum test. We also evaluated any sex differences and potential changes in teaching methods by using the Wilcoxon rank-sum test. We used SAS 9.1 software for all analyses (SAS Institute, Inc., Cary, NC), and a 2-sided $P<0.05$ was regarded as statistically significant.

RESULTS

We received responses from 248 fourth-year Ob/Gyn residents. Most of the respondents were women (74%). Comparison in demographic, educational, and attitudinal data between 2001 and 2008 are presented in **Table 1**. Overall, there seem to be significantly more programs that offer a laparoscopic fellowship. As in 2001, a large majority of responders believe that emphasis on laparoscopy training should be increased or greatly

increased (65.1%). Interestingly, graduating residents in 2008 expect to perform a greater number of laparoscopic cases 5 years after graduation than the graduating residents in 2001 did. Perhaps not surprisingly, awareness of the AAGL fellowship programs has significantly increased, and well over half of the graduating residents felt that a laparoscopy fellowship program would be beneficial to them following graduation. The majority of residents do not favor a board-certified subspecialty in MIGS; however, the proportion of residents who favor a MIGS subspecialty has increased significantly. **Table 2** presents a comparison between mean self-perceived competencies in various MIS procedures in 2001 and 2008. Perceived competencies in total laparoscopic hysterectomy, laparoscopic supracervical hysterectomy, and laparoscopic myomectomy are all significantly higher in the current survey. However, perceived competencies in the laparoscopic Burch procedure and laparoscopic treatment of endometriosis remains low, and the data indicate a declining trend in perceived competencies. Perceived competencies in hysteroscopic skills seem to have significantly improved. The data in **Table 3** examine potential sex differences in perceived competencies in the current survey. As can be seen from the data presented, there are minimal sex differences in perceived competencies, with men reporting significantly higher competencies in total laparoscopic hysterectomy and laparoscopic treatment of endometriosis. The availability of MIGS teaching methods appears to have increased significantly according to the data presented in **Table 4**. We also evaluated the potential association between teaching methods and perceived competencies as presented in **Table 5**. A significantly higher level of perceived competency in advanced laparoscopy was found among residents who had access to a dry laboratory (box trainers), lectures, and a formal surgical skills assessment compared with residents who did not have access to these teaching methods. Overall lectures and a formal surgical skills assessment seemed to have the most widespread effect on perceived competencies in laparoscopy and hysteroscopy.

DISCUSSION

The results of the current study indicate that senior Ob/Gyn residents appear to have higher self-perceived competencies in most laparoscopic and hysteroscopic procedures compared with senior Ob/Gyn residents in 2001. However, the continued low self-perceived proficiency rating for specific advanced methods, such as

Table 1.
Demographic, Educational and Attitudinal Information

Variable	2001 (N = 295)	2008 (N = 248)	p
Men	83 (28.0)	64 (26.0)	
Women	212 (72.0)	179 (74.0)	.64
Entering fellowship training after graduation	39 (17.7)	47 (23.7)	<.001
Laparoscopy fellowship offered at program			
Yes	8 (3.0)	23 (9.6)	
No	287 (97.0)	216 (90.4)	<.001
Emphasis on laparoscopy training should be			
Decreased	2 (0.7)	0	
Unchanged	0	1 (0.4)	
Increased	92 (31.9)	84 (34.6)	
Greatly increased	161 (55.9)	126 (51.9)	
Cases to be done laparoscopically 5 years after graduation	33 (11.5)	32 (13.2)	.43
1–15	41 (14.2)	33 (13.6)	.91
16–30	130 (44.6)	66 (27.2)	<.001
31–50	92 (31.1)	83 (34.2)	.47
>50	29 (10.0)	61 (25.1)	<.001
Aware of existence of new laparoscopy fellowship programs			
Yes	147 (50.0)	226 (93.0)	
No	146 (50.0)	17 (7.0)	<0.001
Think laparoscopy fellowship programs would be beneficial			
Yes	147 (51.0)	137 (56.8)	
No	142 (49.0)	104 (43.2)	.17
Laparoscopic surgery should be a board-certified subspecialty			
Yes	44 (15.0)	89 (36.6)	
No	246 (85.0)	154 (63.4)	<0.001

endometriosis treatment and myomectomy, highlights the need for improved training in these procedures. Moreover, the majority of senior residents believe that emphasis on laparoscopic training should be increased, and significantly more senior residents expect their proportion of laparoscopic cases to be higher than 50% following graduation. There has also been a significant increase in the number of available MIGS fellowship sites as well as the availability of MIGS training opportunities during residency. Taken together, it appears that MIGS training may be more ingrained into current residency programs compared with 7 years ago. Indeed, a recent publication indicates that the majority of residency programs in the United States

have established a formal curriculum in minimally invasive surgery.⁶

The number of available MIGS fellowship sites has increased from 5 locations in 2001 to 23 fellowship sites offered in 2008.⁷ As graduates of these programs enter into practice, the diffusion of advanced laparoscopic techniques is likely to spread faster through the medical community and will probably result in an even greater number of fellowship sites around the country. The effects of this trend may explain some of the findings of our survey, since hiring a faculty member with special skills in laparoscopic surgery has been shown to considerably improve resident exposure and experience in minimally invasive

Table 2.

Mean Self-Perceived Competencies in Basic and Advanced Laparoscopic and Hysteroscopic Procedures

Procedure	2001	2008	p
Basic Laparoscopy			
Diagnostic laparoscopy	4.89	4.86	.08
Bilateral tubal ligation	4.90	4.88	.20
Treatment of ectopic pregnancy	4.56	4.67	.07
Advanced Laparoscopy			
Oophorectomy	4.59	4.68	.13
Total hysterectomy	1.96	3.18	<.001
LAVH	3.83	4.01	.14
Subtotal hysterectomy	2.13	3.70	<.001
Myomectomy	2.14	2.33	.04
Burch	1.54	1.31	.005
Endometriosis treatment	3.69	3.24	<.001
Basic Hysteroscopy			
Office hysteroscopy	3.01	3.71	<.001
Diagnostic hysteroscopy	4.88	4.90	.54
Polyp removal	4.58	4.78	.008
Advanced Hysteroscopy			
Endometrial ablation	4.11	4.64	<.001
Septum transection	2.81	3.22	<.001

surgery.⁸ Although most residents do not favor the establishment of a board certified MIGS subspecialty, the proportion of residents who are in favor of this proposal has increased significantly in the past 7 years. There appears to be a rapid evolution towards subspecialty training within the field of Ob/Gyn,⁹ and in fact we found that significantly more responders (17.7% vs 23.7%) in our study were planning to enter a fellowship compared with residents in 2001.

We were encouraged by the increased availability of a formal curriculum in MIGS teaching methods revealed by our current survey. Surgical simulation centers are currently being established around the country, in part as a result of a recent mandate by the Surgery Residency Review Committee that every General Surgery residency training program must have a skills lab or access to one by 2008.¹⁰ The emphasis on simulation training in minimally invasive gynecologic surgery is likely to increase in the near future due to widespread availability and because this has been shown to improve actual surgical performance in the operating room.^{11,12}

Table 3.

Gender Differences in Mean Self-Perceived Competencies

Procedure	Men	Women	p
Basic Laparoscopy			
Diagnostic laparoscopy	4.83	4.86	.83
Bilateral tubal ligation	4.91	4.87	.99
Treatment of ectopic pregnancy	4.67	4.68	.31
Advanced Laparoscopy			
Oophorectomy	4.65	4.69	.64
Total hysterectomy	3.47	3.07	.03
LAVH	4.13	3.98	.24
Subtotal hysterectomy	3.88	3.63	.10
Myomectomy	2.58	2.23	.07
Burch	1.41	1.28	.28
Endometriosis treatment	3.56	3.13	.009
Basic Hysteroscopy			
Office hysteroscopy	3.69	3.72	.78
Diagnostic hysteroscopy	4.88	4.92	.87
Polyp removal	4.73	4.78	.76
Advanced Hysteroscopy			
Endometrial ablation	4.61	4.66	.68
Septum transection	3.39	3.15	.20

It is worth mentioning some of the important limitations of our findings. We received responses from 248 of the estimated 950 Ob/Gyn residents in the US for a response rate of 26.1%. This is similar to the 26.8% response rate in the 2001 survey. We took several steps to increase our response rate; nevertheless, it is possible that the residents who chose to answer our survey were not a representative sample of current senior Ob/Gyn residents. It may be that residents who come from unusually strong or weak programs in laparoscopic surgery might have been more likely to respond to our survey. However, because we did not have the direct contact information for the residents, it may be that some of the program directors that we contacted chose not to forward the survey to their residents. Therefore, our response rate may not be as low as these numbers may suggest. Another important limitation is that the survey measured perceived competencies and not actual competencies, which may not be accurately reflected in the results.

CONCLUSION

The results of our study seem to indicate that senior Ob/Gyn residents are more comfortable performing ad-

Table 4.
Teaching Methods Available in 2001 and 2008

Teaching Method	2001*	2008*	P
Dry Laboratory	158 (59.4)	206 (86.2)	<0.001
Animal Laboratory	159 (58.2)	156 (65.3)	0.10
Formal Didactic Curriculum	229 (86.4)	228 (94.2)	0.003
Surgical Skills Assessment	158 (62.0)	202 (85.2)	<0.001

*Data are presented as n (%).

Table 5.
Association Between Teaching Methods and Perceived Competencies

Procedure Type*	Dry Laboratory†		Animal Laboratory†		Lectures†		Surgical Skills Assessment†	
	No (n = 115)	Yes (n = 122)	No (n = 149)	Yes (n = 87)	No (n = 133)	Yes (n = 106)	No (n = 111)	Yes (n = 124)
Basic Laparoscopy	14.17	14.64	14.29	14.67‡	14.30	14.57	14.27	14.57
Advanced Laparoscopy	21.88	23.41‡	22.29	23.39	21.97	23.43‡	21.64	23.46‡
Basic Hysteroscopy	13.15	13.65	13.34	13.60	13.05	13.86‡	12.90	13.80‡
Advanced Hysteroscopy	7.72	8.02	7.88	7.85	7.50	8.35‡	7.55	8.12‡

*Basic laparoscopy refers to combined scores for diagnostic laparoscopy, tubal ligation, and treatment of ectopic pregnancy.

Advanced laparoscopy refers to combined scores for oophorectomy, supracervical hysterectomy, total laparoscopic hysterectomy, LAVH, treatment of moderate to severe endometriosis, myomectomy, and Burch procedure. Basic hysteroscopy refers to combined scores for office hysteroscopy, diagnostic hysteroscopy, and polyp removal. Advanced hysteroscopy refers to combined scores for septum transection and endometrial ablation.

†Numbers represent mean competency scores with higher scores indicating higher perceived competency.

‡P<0.05.

vanced laparoscopic procedures at graduation in 2008 compared with graduating residents in 2001. The majority feels that the emphasis on training in minimally invasive surgery should be increased.

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