

Laparoscopy Training in United States Obstetric and Gynecology Residency Programs

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ABSTRACT

Objectives: To assess laparoscopic training curriculums in US Obstetrics and Gynecology residency programs.

Methods: A list of E-mail addresses was obtained for the accredited Obstetrics and Gynecology residency programs in the US from the CREOG Directory of Obstetric-Gynecologic Residency Programs and Directors. An E-mail survey containing 8 questions regarding laparoscopy training was sent to all residency directors with current E-mail addresses.

Results: Seventy-four residency directors responded to the survey for a response rate of 41%. Residency programs from all sections of the US were included in the study. Results of the survey indicate that 69% of residency programs had implemented a formal laparoscopy training program. At least half of the program directors surveyed stated that lack of faculty time and funds were the main barriers to laparoscopic surgery training. Seventy-two percent of those surveyed thought that in the future the health-care industry would demand proof of competency in laparoscopy as standard of care.

Conclusions: Most US Obstetrics and Gynecology residency programs have implemented a formal laparoscopy training curriculum, use more than one method to train their residents, and involve almost half of their faculty on average in training residents to perform laparoscopic surgery.

Key Words: Laparoscopy, Education, Residency, Surgery.

INTRODUCTION

Laparoscopic-assisted surgical procedures are performed in many surgical specialties including Obstetrics and Gynecology. Over the past 2 decades, the repertoire of laparoscopic procedures performed in gynecology has broadened. Today, nearly all gynecologic surgical procedures can be performed via laparoscopy. With certain procedures, such as tubal ligation performed at a time remote from delivery, it seems intuitive that the laparoscopic approach is best. However, with other procedures, such as hysterectomy, the advantages of a laparoscopic approach are not as clear. One report concluded that the advantages of laparoscopic-assisted vaginal hysterectomy over abdominal hysterectomy include a shorter hospital stay, speedier postoperative recovery, and a reduction in analgesia requirements.¹

No surgical procedure is devoid of risk. With laparoscopy, the surgical risks include both those of an open procedure and those of the laparoscopy itself. More specifically, laparoscopic-assisted procedures are associated with a risk of injury during the placement of the pneumoperitoneum needle, placement of one or more trocars, and injury from instruments used to deliver electrical energy through a metal trocar. Beyond those procedure-specific complications, when laparoscopic-assisted hysterectomy was compared with abdominal hysterectomy, the laparoscopic approach was associated with a higher rate of bladder injury and a longer procedure time.¹

Training residents to perform laparoscopic surgery is an important part of the teaching mission of the medical faculty in an Obstetrics and Gynecology residency program. With surgical training, the goal is to produce a surgeon who is highly competent and confident in performing laparoscopic procedures; and thereby mitigate the risks of complications. Because of the specific risks, visuospatial relationships, and the steep learning curve that are unique to laparoscopy, surgical training via the apprentice-mentor teaching method may be suboptimal for teaching laparoscopic surgery. In an effort to reduce this concern, several surgical training techniques have been developed and are currently being used to teach laparoscopic surgery. Included are didactic sessions, instructional videos, live animal laboratories, pelvic or vir-

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tual reality trainers, intraoperative telementoring, dominant and nondominant hand training, 1-hand and 2-hand skills, laparoscopic dissection, and laparoscopic suturing techniques. By using a variety of these types of techniques, effective laparoscopic training programs have been developed for resident education.²

A review of the literature from the American College of Obstetrics and Gynecology (ACOG) and the Council on Residency Education in Obstetrics and Gynecology (CREOG) revealed little guidance regarding the preferred method(s) for teaching laparoscopic techniques to residents in obstetrics and gynecology. The purpose of this study was to assess the current status of laparoscopic training in US Obstetric and Gynecology residency training programs. Included in our assessment were questions regarding whether US residency programs have implemented a formal laparoscopic teaching curriculum in their program, the spectrum of techniques that are currently being used to teach residents, the technique(s) that residency directors think work best, the barriers that impede the advancement of laparoscopic training, and whether nationally standardized testing should be developed to evaluate the surgical competency of graduating residents.

METHODS

Our local University Institutional Review Board approved this study. A questionnaire was developed to assess several areas of interest in laparoscopic training in Obstetrics and Gynecology residency programs. The questions from the survey are listed in **Table 1**. The survey was beta tested by administering it to a small group of both Obstetric and Gynecology and General Surgery program directors and their chief residents. Once suitable, the survey was sent via E-mail to the residency program directors of the Obstetrics and Gynecology residency programs in the United States. A list of accredited programs and the E-mail addresses of their residency directors was obtained from the CREOG Directory of Obstetric-Gynecologic Residency Programs and Directors. Programs were excluded from the study if a current E-mail address for the residency director was not available.

Residency directors were given 6 months to respond to the questionnaire, and a reminder E-mail was sent after 2 weeks and 3 months to the nonresponders. The residency directors were informed that all of their answers would remain anonymous and that no program would be mentioned by name in any subsequent publication(s).

The area of the country represented by each residency

Table 1.

Survey Questions on Residency Training in Laparoscopy in Obstetrics and Gynecology

1. Does your department have a formal curriculum for residency training in laparoscopy?
2. In training your residents for laparoscopic surgery, do you use any of the following?
 - a. Formal teaching lectures
 - b. An animal laboratory, and if so what animal
 - c. A pelvic trainer, virtual reality trainer, or other laparoscopic training device
 - d. Send residents to a formal laparoscopy training course(s)
 - e. Administer a written examination to assess fundamental knowledge of laparoscopy
 - f. Telementoring during laparoscopic cases
 - g. Use other teaching modality
3. If you had to choose only one of the above, which teaching modality do you think is the most important in teaching residents laparoscopic surgery?
4. If there is an element to your laparoscopic training that you would like to see more of, which would it be?
5. What is the major reason that you don't implement the element from question number four into your training now?
6. Do you think that within the next 10 years the health-care industry will demand proof of competency in laparoscopy as standard of care for providers of laparoscopic surgical procedures?
7. Do you think it would be beneficial to have a standardized clinical examination for graduating residents to test skills in gynecological laparoscopy at the completion of residency?
8. How many members of your faculty are actively involved in training residents in laparoscopy and what percentage of your teaching faculty does this number represent?

program was recorded, and the size of the faculty of each program was calculated from the information obtained from the survey. A space was made available within the survey form in which residency directors could record additional comments. No incentives were given to survey participants.

RESULTS

Although the survey was sent via E-mail to all US Obstetric and Gynecology residency programs with a valid E-mail address, some messages were returned undelivered with invalid addresses. Of the 180 surveys that were success-

fully delivered, 74 (41%) were returned with a completed survey from the residency program director. Each of the following regions of the US was represented by at least 1 residency program: Northeast (19), Southeast (14), Midwest (7), Southwest (14), Northwest (6), and West (14). Program directors from both university (47) and community-based (27) residency programs responded to the survey. The mean number of clinical faculty in the residency programs whose program directors responded to the survey was 20.7. Of the respondents, 51 (69%) reported having implemented a formal curriculum for laparoscopy training in their residency program. The residency programs used various methods to train their residents in laparoscopic surgery. All residency program directors who responded to the survey stated that they used tele-mentoring during laparoscopy cases to help train their residents in laparoscopic surgery. Didactic lectures were utilized by 68 (92%) of the respondents. An animal laboratory was used by 63 (85%) of the respondents with all but 2 programs using a porcine model. Pelvic trainers were used in laparoscopic surgery training by 64 (86%) of the respondents. Twenty-two (30%) of the programs sent their residents to a laparoscopy training course, and only 7 programs (9%) utilized a written examination to assess fundamental knowledge of laparoscopy. Finally, 7 (9%) programs stated that they used one or more other teaching methods not contained within the survey to train their residents in laparoscopic surgery.

When asked to choose which of the surgical training techniques they thought was the most important in teaching laparoscopy, four (5%) of the respondents did not select a method. Of the remaining 70 program directors who choose a technique, 34 (49%) choose an animal laboratory, 22 (31%) choose tele-mentoring during laparoscopic surgery, 12 (17%) choose a pelvic or virtual reality trainer, and two (3%) choose formal lectures. None of the respondents choose sending their residents to a formal laparoscopy course as the best method of training.

When asked whether there was an element to their laparoscopic training they would like to see more of, 61 (82%) program directors gave a positive response. The methods the program directors wanted more of were an animal laboratory 29 (48%), a pelvic trainer 14 (23%), and tele-mentoring during laparoscopic cases 14 (23%). The 4 (7%) remaining program directors who responded positively to the question regarding more laparoscopic training choose videotaped surgical procedures as the method they wanted to see more of in their residency program. None of the respondents wanted to see more residents sent to laparoscopic courses or written examinations to help as-

sess their residents' fundamental knowledge of laparoscopic surgery. When asked to state the major reason why any of these elements had not already been added to their curriculum, most respondents gave more than one answer. The most common reason given for not implementing more elements into their training was lack of faculty time (40, 54%), followed by lack of funding (38, 51%), insufficient patient volume (9, 12%), and finally space limitations (2, 3%).

The next subjects contained within the survey included proof of competency in laparoscopic surgery, a need for a standardized clinical examination for graduating residents and the number and percentage of faculty actively involved in training laparoscopy. Of the 74 respondents, 53 (72%) thought that within the next 10 years the health-care industry would demand proof of competency in laparoscopy as the standard of care for providers of laparoscopic surgical procedures. Most of the program directors (40, 54%) thought that it would be beneficial to have a standardized clinical examination for graduating residents to test their skills in gynecologic laparoscopy. The remaining respondents were either against this idea (29, 39%) or were unsure (5, 7%).

The absolute number of teaching faculty within the 74 programs who were actively involved in laparoscopic training ranged from 1 to 30 with a mean of 9.7. The percentage of faculty actively involved in laparoscopic training ranged from 8% to 95% with a mean of 45.5%.

DISCUSSION

Surgical competence reflects the knowledge, judgment, and attitude of the surgeon.³ Providing residents with competence in the full breath of laparoscopic-assisted surgical procedures during 4 years of an Obstetrics and Gynecology residency is a difficult task. Each of the subspecialties continues to add new laparoscopic techniques to their surgical armamentarium. Furthermore, other components of the residents' learning objectives continue to expand at an increasing pace. The need to learn primary care medicine, an increasing array of new pharmaceutical agents, a working knowledge of basic science applications, and ever-changing treatment guidelines only compound the teaching mission.

The important components of gynecologic laparoscopic training are well developed. One component of laparoscopic training is the concept of a steep learning curve. Unfortunately, this leads to longer operative time and that prospect may reduce the opportunity for beginning sur-

geons to develop their skills and knowledge in the operating room. Another component of laparoscopic surgical training is basic motor-skill learning. Two activities that improve motor-skill learning include mastery of the components of a routine before progressing to the full routine⁴ and repetitive practice.⁵ These learning techniques are most successful when accompanied by an adult education concept that includes a self-directed curriculum, specific tasks, and constructive feedback.⁶ When neurophysiologic testing was performed on surgical residents, surgical skills were found to correlate with the ability to use landmarks to create a mental 3-dimensional picture (visuospatial perception), the ability to interpret sensory cues based on prior experience (somatosensory memory), and the ability to distinguish essential detail from nonessential detail (stress tolerance).⁷

In this study, we found that most (69%) of the US Obstetric and Gynecology residency programs have implemented a formal laparoscopy training curriculum. Furthermore, greater than 80% of programs use a combination of telementoring, didactic lectures, an animal laboratory, and a pelvic trainer to train their residents in laparoscopic surgery. The types of techniques most commonly utilized by residency programs to teach their residents correlated well with the training techniques that residency directors thought were the most important and with the techniques they wanted to see used more frequently. It seems reasonable that programs would want to use more than one technique in their training. While a hands-on approach helps with motor-skill learning, visuospatial perception and somatosensory memory; telementoring during laparoscopic cases helps the resident to distinguish essential from nonessential detail and provides a live review of the surgical technique.

Greater than 50% of the residency program directors that responded to the survey thought that lack of both faculty time and funds were the major reasons they have not implemented more laparoscopic teaching opportunities into their residency programs. Although this response is of concern, the survey did not ask whether these factors were actually preventing residency programs from successfully accomplishing their teaching mission regarding laparoscopic training. However, many respondents used the comments section to expand on this subject and describe their frustration with the numerous teaching responsibilities that must be addressed with limited resources. The respondents commented further that no one had ever previously asked them about this issue despite their frustrations and its importance. Despite these difficulties, more than half of the respondents thought that the

health-care system would demand proof of competency in laparoscopic surgery as a standard of clinical care and that it would be beneficial to have a standard examination for graduating residents.

Results from the survey reveal that on average 45% of the faculty from a given residency program are involved in laparoscopic training. This percentage of faculty certainly seems sufficient. However, several aspects regarding this area are of interest that we did not address. We do not know what percentage of each faculty's time is spent in training laparoscopy, what procedures are being taught, and what percentage of the teaching faculty are subspecialists.

As with any study, ours has its strengths and weaknesses. One possible flaw of this study is the potential for bias in the pool of residency directors who responded to the survey. Program directors who think that laparoscopic surgery training is a particularly important issue or are significantly vested in their laparoscopic training program may have been more likely to have responded to the survey. Furthermore, because E-mail solicitation is a relatively passive route of recruitment, it too may specifically elicit responses from a similar pool of program directors. This subgroup of programs may be more likely to have implemented a formal laparoscopy training curriculum and may have a greater percentage of their faculty dedicated to laparoscopic training. One advantage of this self-selection process is that these same program directors may have the most experience and knowledge in this area of residency education and that may be the best subgroup from which to obtain this information. Although the response rate was modest at 41%, we were able to obtain information from all regions of the country, and both university- and community-based residency programs were included in the respondents. We did not ask some more specific questions that are of interest including what directors thought was the best year for laparoscopic training and how often do or should residents participate in laparoscopic training endeavors.

What the future holds for laparoscopic training methodologies, the requirement for standardized testing, and proof of competency in laparoscopy is unclear. What is clear is that most residency directors we surveyed think that the health-care industry will require proof of competency in laparoscopy as standard of care. Approximately half of the program directors think that it would be beneficial to have a standardized clinical examination to test one's skills in gynecologic laparoscopy at the conclusion of residency training. One possible reason for the lack of

support for a standardized test may be the fact that Obstetric and Gynecology residents are already evaluated on their surgical skills on a weekly basis and are subject to annual written examinations during their residency through the Council on Residency Education in Obstetrics and Gynecology and must pass both a written and oral examination after residency to be certified by the American Board of Obstetrics and Gynecology.

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