

The effect of laparoscopy courses in laparoscopy practice after urology resident training: A questionnaire-based observational study

Laparoskopi kurslarının üroloji asistan eğitimi sonrası laparoskopik uygulamalarına etkisi: Ankete dayalı gözlemsel çalışma

Gökhan Özmerdiven¹, Onur Kaygısız², Çağatay Çiçek², Kadir Ömür Günsere², Hakan Vuruşkan²

¹ Istanbul Aydın University, School of Medicine, Department of Urology, Department of Urology, Istanbul, Turkey

² Uludağ University, School of Medicine, Department of Urology, Bursa, Turkey

ORCID ID of the author(s)

GÖ: 0000-0002-0142-0897

OK: 0000-0002-9790-7295

ÇÇ: 0000-0002-0471-5404

KÖG: 0000-0001-8673-3093

HV: 0000-0001-9549-8435

Abstract

Aim: Laparoscopy is an important part of surgical training. Laparoscopy courses are organized to increase competence of laparoscopy. This aim of this paper is to evaluate the laparoscopic surgery competence of Turkish urologists and the effectiveness of laparoscopy courses.

Methods: In 2014, an online survey consisting of 11 questions was sent to 180 urologists via e-mail, among which 78 responded. The survey questions aimed at gathering information about where the urologists worked, their laparoscopic surgical experience, how long they attended laparoscopy courses, and whether they considered themselves to be competent in laparoscopic surgeries.

Results: 41.2% of the respondents who considered themselves to be competent in laparoscopy and 84.1% of those who did not, stated that they wanted to attend laparoscopy courses ($P<0.001$). 100% of the respondents who could perform Level-1 laparoscopy surgeries stated that they did not consider themselves to be competent and wanted to receive laparoscopic training ($P<0.001$). 54.9% of those who did not receive laparoscopy training during their residency and 48.1% of those who received training during residency stated that they attended courses in the past. All respondents who attended long-term courses and 73.6% of those who attended short-term courses could perform laparoscopic surgeries ($P<0.001$). It was also determined those who attended long-term courses could perform complicated laparoscopic surgeries ($P<0.001$).

Conclusion: This study revealed that the courses contributed a lot to laparoscopic surgical competence after residency. The study stresses that if the urologists who did not receive laparoscopy training during their residency attend long-term courses, they can increase their competence in laparoscopy.

Keywords: Laparoscopy, Course, Survey, Competence

Öz

Amaç: Laparoskopik cerrahi eğitimin önemli bir parçasıdır. Laparoskopik yeterliliğini arttırmak için laparoskopik kursları düzenlenmektedir. Bu yazıda Türk ürologların, laparoskopik cerrahi yeterliliği ve laparoskopik kurslarının etkinliğinin değerlendirilmesi planlandı.

Yöntemler: 2014 yılında Türkiye’de üroloji alanındaki 180 uzmana e-mail anket formu gönderildi. Sorulara yanıt veren 78 üroloji uzmanının, çalıştığı kurum, laparoskopik deneyimi, aldıkları laparoskopik kurs süresi ve laparoskopik cerrahisindeki yeterlilikleri 11 soruluk anket ile sorgulanmıştır.

Bulgular: Laparoskopik konusunda kendini yeterli gören uzmanların %41,2’si, yeterli görmeyenlerin %84,1’i kurs almak istediğini belirtti ($P<0,001$). Zorluk seviyesi 1 kabul edilen laparoskopik vakaları yapabilen uzmanların %100’ü kendini yeterli görmeyip, laparoskopik eğitimi almak istediğini belirtti ($P<0,001$). Asistanlığında laparoskopik eğitimi almayanların %54,9’u ve alanların %48,1’i kurs almış. Uzun süreli kurs alanların hepsi, kısa süreli kurs alanların %73,6’sı laparoskopik yapabiliyordu ($P<0,001$). Uzun süreli kurs alanlar daha zor vaka yapabildiği izlenmektedir ($P<0,001$).

Sonuç: Yapılan anketin sonucunda, asistanlık sonrası laparoskopik cerrahi yeterliliğinde kursların büyük yarar sağladığı görülmektedir. Asistanlığında laparoskopik eğitimi almayan ürologların, uzun süreli eğitim veren merkezlerde bulunması laparoskopik becerilerini arttıracaklarını düşünmekteyiz.

Anahtar kelimeler: Laparoskopik, Kurs, Anket, Yeterlilik

Corresponding author / Sorumlu yazar:

Gökhan Özmerdiven

Address / Adres: Istanbul Aydın Üniversitesi Tıp Fakültesi, Üroloji Anabilim Dalı, Turgut Özal str. No: 1, Küçükçekmece 34303 İstanbul, Türkiye
e-Mail: gozmerdiven@gmail.com

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Introduction

The laparoscopic approach has been used with increasing frequency in urology during the last 25 years due to technological and technical development. In parallel with the development of suturing techniques and sutures, laparoscopic surgeries have become widespread all over the world and almost all urologic operations are currently performed by laparoscopic technique [1-4]. Compared to open surgery, laparoscopic technique reportedly provides a significant advantage in shortening hospital stay and decreasing postoperative pain [5].

Laparoscopic surgical skills are an integral part of surgical training [6], and laparoscopic surgery is harder than open surgery due to reduced depth perception that arises from two-dimensional vision, reduced tactile sensations, and the need for hand-eye coordination. Therefore, laparoscopic surgery requires a new structured training program that should include clinical practice [7].

Due to the need for laparoscopic training, various centers have invested to promote training through skill-courses [8]. However, acquiring laparoscopic skills, especially stitching skills, is a difficult and lengthy process [9]. The long-term impact of the courses on surgical practice is still unknown. It is also difficult to assess the impact of these courses on surgical practice because training centers do not provide feedback [10].

In the literature, short-term laparoscopy courses have been shown to be an effective and useful method to achieve laparoscopic skills [11]. However, urologists still need to transfer their knowledge and experience to clinical practice. Although short-term courses provide ample experience, the transferal of skills to the clinical practice may be insufficient. For this reason, it is thought that long-term training methods can be developed with the training models developed in short-term courses [12,13].

In this study, we investigated the competence of urology specialists to perform laparoscopy and the period of training courses that are more useful.

Materials and methods

An online survey was sent to 180 urologists between 01.10.2014 and 30.10.2014. The survey response rate was 43.33% (78 persons). All answers were recorded on an Excel form. This 2-page questionnaire was prepared anonymously by Uludag University Faculty of Medicine, department of Urology by the approval of the Ethics Committee of Uludag University (2017-13/54). The survey containing 11 questions is presented in Table 1. Laparoscopy courses after residency were grouped under three headings according to the responses: a short course of maximum three days, a long local course of at least three months, and a long international course of at least three months. All the long courses abroad were certified centers for laparoscopy. The domestic long-term courses attended by four respondents held regular courses while the other centers did not.

Urological laparoscopic cases were divided into 4 levels according to their difficulty and respondents were asked what level of surgery they could perform.

- Level 1: Diagnostic laparoscopy, laparoscopic orchiopexy, laparoscopic cyst excision
- Level 2: Laparoscopic nephrectomy, laparoscopic ureterolithotomy, laparoscopic pyelolithotomy, laparoscopic adrenalectomy

- Level 3: Laparoscopic pyeloplasty, laparoscopic sacrocolpexy, laparoscopic simple prostatectomy
- Level 4: Laparoscopic radical prostatectomy, laparoscopic partial nephrectomy, laparoscopic radical cystoprostatectomy

Statistical analysis

The information in the survey form was recorded numerically in SPSS version 15 (SPSS Inc, Chicago, Ill, USA) program and analyzed. Chi-square test was used to compare the data. $P < 0.05$ was considered statistically significant.

Table 1: Survey form

1. Your title:	a. Specialist b. Assistant Professor c. Associate Professor d. Professor
2. Where did you receive laparoscopy training?	a. Training and Research Hospital b. University-public c. University-private
3. Expertise period: (year)	
4. Place of work:	a. Public Hospital b. Training and Research Hospital c. University Hospital d. Private Hospital
5. Did you receive laparoscopic surgery training during your specialization?	Yes No
6. Do you perform laparoscopic urological surgeries?	Yes No
7. Do you consider yourself to be competent in laparoscopic surgeries?	Yes No
8. Do you want to receive laparoscopy training?	Yes No
9. Where did you receive laparoscopy training after specialization?	a. Short term course b. Training and practice in a domestic center c. Training and / or practice in a center abroad
10. What is the name of the institution where you received laparoscopic surgery training after specialization and how long did you train?	
11. What laparoscopic surgeries have you performed in the last two years? (you can mark more than one item)	a. Diagnostic laparoscopy, Laparoscopic orchiopexy b. Laparoscopic nephrectomy, Laparoscopic ureterolithotomy, Laparoscopic pyelolithotomy, Laparoscopic adrenalectomy c. Laparoscopic pyeloplasty, Laparoscopic sacrocolpexy, Laparoscopic simple prostatectomy d. Laparoscopic radical prostatectomy, Laparoscopic radical cystoprostatectomy, Laparoscopic partial nephrectomy

Results

The mean duration of specialization was 6.5 years (1-16 years). Respondents included 10 professors, 13 associate professors, 11 assistant professors and 42 specialists. The titles of two respondents were unknown. Fifteen out of 29 respondents with less than 5 years of specialization, six out of 19 respondents with 6-10 years of specialization, five out of 13 respondents with 11-15 years of specialization, and one out of 17 respondents with more than 15 years of specialization had received laparoscopy training during their residency ($P=0.004$). Eighteen of the 27 respondents who received laparoscopy training and 24 of the 51 respondents who did not receive laparoscopy training during residency performed laparoscopic surgeries. The difference between the groups was not significant ($P=0.152$).

The rate of performing laparoscopy was 26.7%, 60.6%, 63.2% and 54.5% in public hospitals, university hospitals, training-research hospitals, and private hospitals, respectively. The rate of performing laparoscopic surgeries of the respondents working in public hospitals was lower than that of the respondents working in other hospitals ($P=0.023$). Sixteen (38.1%) of the 42 respondents who stated that they performed laparoscopic surgeries and 35 (97.2%) of the 36 respondents who stated they could not perform laparoscopic surgeries indicated that they wanted to receive laparoscopic training ($P < 0.001$).

Based on their responses, 4 urologists could perform Level-1 laparoscopic surgeries, 23 urologists, Level-2 laparoscopic surgeries, 9 urologists, Level-3 laparoscopic surgeries, and 10 urologists, Level-4 laparoscopic surgeries. None of the Level-1 laparoscopic surgery performers, 16 (66.7%) of Level-2 performers, 7 (77.8%) of Level-3 performers and 10 (100%) of Level-4 laparoscopic performers considered themselves competent ($P=0.001$). Among respondents, all Level-1 performers, 52.17% of Level-2 performers, 33.3% of Level-3 performers and 10% of Level-4 performers indicated that they wanted to receive laparoscopic training ($P=0.001$) (Figure 1). 41.2% of respondents who considered themselves competent in laparoscopy and 84.1% of those who did not, wanted to receive training ($P<0.001$). 22 of the 27 urologists who did not want to receive training had previously attended courses.

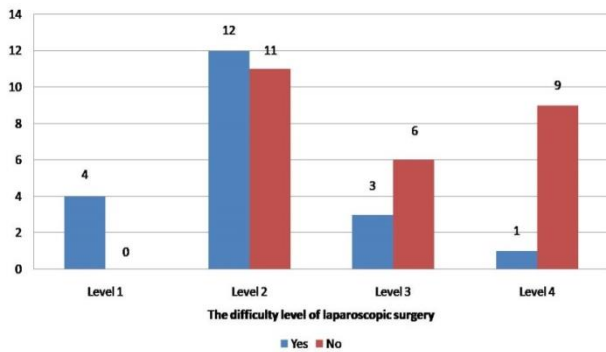


Figure 1: Respondents who want to receive laparoscopy training were asked what level of surgery they could do

Twenty-eight (54.9%) urologists who did not receive laparoscopy training during residency and 13 (48.1%) who did, attended laparoscopy courses after residency ($P=0.637$). Among those who did not receive training during residency, 14 individuals attended short-term courses, five individuals, local long-term courses and nine individuals, international long-term courses. Among those who received training during their residency, the number of individuals who attended short-term, local long-term, and international long-term courses were five, six and two, respectively ($P=0.526$). Twenty-three of 28 urologists who attended laparoscopy courses for the first time after residency stated that they could perform laparoscopic surgeries while 24 respondents who did not attend any courses stated that they could not ($P<0.001$).

Twelve of 13 urologists who received laparoscopic training during residency and again thereafter, and six of the 14 urologists who did not attend any courses could perform laparoscopic surgeries ($P=0.013$).

While all of the 11 urologists who attended local long-term courses and international long-term courses could perform laparoscopic surgeries, of the 19 urologists who attended short-term courses, 14 could perform laparoscopic surgeries ($P<0.001$). Four of those who could not perform laparoscopic surgeries and who attended short-term courses stated that they did not receive laparoscopy training during their residency. In addition, those who attended long-term courses were able to perform more difficult laparoscopic surgeries than those who attended short-term courses ($P<0.001$). Attended course types were presented in figure 2.

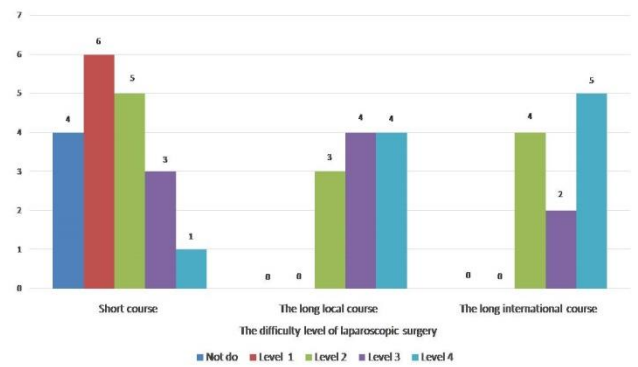


Figure 2: Respondents who perform laparoscopic surgery were asked which course they attended

Discussion

Using the survey method, we investigated the laparoscopic competence of Turkish urologists and the effectiveness of laparoscopy training courses after residency. The majority of the studies on surgery courses to date provide insight into the content of these courses and the attitudes of the participants towards them. However, few studies have been conducted on their clinical implications or educational methods [10]. Therefore, the impact of these courses on health service outcomes, quality of training and resource allocation remains unclear. Research on training shows that between 10% and 40% of the knowledge obtained during training is transferred to clinic practice [14].

In this study, only 27 (34.6%) of 78 urologists and only 1 urologist who had completed their residency before 2005 had received laparoscopic training during residency. This indicates the necessity of additional laparoscopy training for urologists who completed residency training at earlier dates. On the other hand, only half of the urologists who completed their residency in the last 5 years had received laparoscopic training. A survey of urology residents in Europe revealed that laparoscopic surgeries were performed in 74% of the clinics, only 23% of the urologists considered themselves to be competent, and 33% of them received no laparoscopy training or attended no laparoscopy course. It is therefore recommended that urologists are encouraged to attend laparoscopy courses [15].

Nowadays, laparoscopic skills are required of urologists, irrespective of whether they received laparoscopic training. The fact that the respondents who can perform laparoscopic surgeries are working in university or private hospitals further supports this statement. It is therefore important to plan training programs which can contribute to increasing laparoscopic skills for the untrained urologists. According to the 10-year data from a center providing long-term laparoscopic training in the UK, 69% of participants who prefer the laparoscopic method successfully perform laparoscopic surgeries and these courses are useful in developing laparoscopic skills [10].

Short courses implement basic teaching methods such as the training box and laparoscopic surgical observation, and some courses allow training on the animal model. However, this training is not sufficient for participation in the laparoscopic surgery team. This means that the stepped education model proposed in the literature is not completed [16,17]. After a 3-session and 2-week advanced laparoscopy course with a total of

114 participants consisting of general surgery residents and general surgeons, an increase in the rate of laparoscopic anastomosis was observed and there was no difference between the duration of operation performed by experienced specialists and residents [18]. Asano et al. [19] reported that after a 2-day live surgery course, only 62% of the participants could perform laparoscopic surgeries. Okrainec et al. [20] reported that a 3-day laparoscopic training was insufficient. Laparoscopic surgeries require follow-up and knowledge of correct preoperative and postoperative interventions to be applied when necessary. In our study, the rate of performing laparoscopy in short-term courses of participants was found to be 73%, however, mostly simple laparoscopic cases were performed. Experience in managing complications will provide self-confidence for the surgeon who will begin laparoscopic operations for the first time.

Long-term courses can only be offered in experienced centers. Professional organizations should take an active role in establishing links between these centers and urologists who need courses. A study with general surgery specialists participating in long-term laparoscopy courses revealed that there was a 300% increase in the rate of those who could perform laparoscopic surgeries, pointing out the importance of long course programs in minimally invasive surgery [21]. We have determined that the urologists who did not receive laparoscopy training during their residency mostly preferred attending international long-term courses while those who received laparoscopy training during their residency mostly preferred local long-term courses. Considering the number of urologists who want to attend laparoscopy training, we believe underlining the need for the dissemination of these courses will provide benefit.

The majority of the urologists who participated in our study were eager to perform laparoscopic surgeries. Moreover, none of the respondents who did not receive training or attend courses could perform laparoscopic surgeries while 82.14% of those who did not receive laparoscopy training but later attended courses could. This shows that attending courses helps urologists in starting to perform laparoscopic surgeries.

In laparoscopic urological surgery, reconstructive surgeries require more experience than excisional surgeries. In this study, we classified surgery according to difficulty levels. It was found that the respondents who attended international long-term courses were able to perform more complicated surgeries. A survey with 106 urologists reported a slight increase in laparoscopic nephrectomy, laparoscopic nephroureterectomy, laparoscopic pyeloplasty, and laparoscopic partial nephrectomy skills of urologists after a 5-day laparoscopy program. A lower success rate was observed in difficult surgeries such as pyeloplasty and partial nephrectomy and it was stated that longer courses may be required for such operations [22].

Limitations

The percentage of respondents is low (43.33%), but we believe that the population represents urologists who actively perform laparoscopic surgeries within the country, since the respondents in our study had different amounts of work experience. Additionally, reconstructive surgeries and advanced oncological cases were considered Level-3 and 4 surgeries, however, since a surgeon who is not interested in urologic oncology will not perform Level-4 surgeries, he/she may not

appear to be competent in Level-4 surgery, but still perform reconstructive pyeloplasty. Therefore, respondents who can perform Level-3 and 4 surgeries should be considered as able to perform advanced laparoscopic urological surgeries.

Conclusion

The study shows that it is not possible for urologists who do not receive laparoscopy training during residency to start laparoscopic surgeries after short-term training. Also, the trainings held in local and international competent centers will contribute to the learning of laparoscopy. Trainings in the international centers will both be costly and fail to reach large audiences; therefore, competent centers are needed in the country. We believe that the adoption of certain standards by laparoscopic centers, whose numbers are increasing in the country, will allow laparoscopic surgeries to be widely performed.

References

- Lane BR, Gill IS. 7-Year oncological outcomes after laparoscopic and open partial nephrectomy. *J Urol.* 2010;183:473-9.
- McNeill SA, Tolley DA. Review laparoscopy in urology: indications and training. *BJU Int.* 2002;89:169-73.
- Shalhav AL, Dabagia MD, Wagner TT, Koch MO, Lingeman JE. Training postgraduate urologists in laparoscopic surgery: The current challenge. *J Urol.* 2002;167:2135-7.
- Kaynan AM, Lee KL, Winfield HN. Survey of urological laparoscopic practices in the state of California. *J Urol.* 2002;167:2380-6.
- Khan MN, Fayyad T, Cecil TD, Moran BJ. Laparoscopic versus open appendectomy: The risk of postoperative infectious complications. *JSL.* 2007;11:363-7.
- Barnes RW. Surgical handicraft: teaching and learning surgical skills. *Am J Surg.* 1987;153:422-7.
- Gonzalez D, Carnahan H, Praamsma M, Dubrowski A. Control of laparoscopic instrument motion in an inanimate bench model: Implications for the training and the evaluation of technical skills. *Appl Ergon.* 2007;38:123-32.
- Kroeze SG, Mayer EK, Chopra S, Aggarwal R, Darzi A, Patel A. Assessment of laparoscopic suturing skills of urology residents: a pan-European study. *Eur Urol.* 2009;56:865-72.
- Bansal VK, Tamang T, Misra MC, Prakash P, Rajan K, Bhattacharjee HK, et al. suturing skills acquisition: a comparison between laparoscopy exposed and laparoscopy-naive surgeons. *JSL.* 2012;16:623-31.
- Khan MH, Aslam MZ, McNeill A, Tang B, Nabi G. Transfer of Skills From Simulation Lab to Surgical Services: Impact of a Decade Long Laparoscopic Urology Surgical Course. *J Surg Educ.* 2019;76:591-9.
- Tunc L, Guven S, Gurbuz C, Gozen AS, Tuncel A, Saracoglu F, et al. Evaluation of applied laparoscopic urology course using validated checklist. *JSL.* 2013;17:300-5.
- Frede T, Erdogru T, Zukosky D, Gulkesen H, Teber D, Rassweiler J. Comparison of training modalities for performing laparoscopic radical prostatectomy: Experience with 1,000 patients. *J Urol.* 2005;174:673-8.
- Hruza M, Weiss HO, Pini G, Goetzen AS, Schulze M, Teber D, Rassweiler JJ. Complications in 2200 consecutive laparoscopic radical prostatectomies: standardised evaluation and analysis of learning curves. *Eur Urol.* 2010;58:733-41.
- Burke LA, Baldwin TT. Workforce training transfer: a study of the effect of relapse prevention training and transfer climate. *Hum Resour Manage.* 1999;38:227-41.
- Furriel FT, Laguna MP, Figueiredo AJ, Nunes PT, Rassweiler JJ. Training of European urology residents in laparoscopy: results of a pan-European survey. *BJU Int.* 2013;112(8):1223-8.
- Ehdaie B, Tracy C, Reynolds C, Cung B, Thomas K, Floyd T, et al. Evaluation of laparoscopic curricula in American urology residency training. *J Endourol.* 2011;25:1805-10.
- Brinkman WM, Tjiam IM, Schout BM, Muijtens AM, Van Cleynenbreugel B, Koldewijn EL, et al. Results of the European basic laparoscopic urological skills examination. *Eur Urol.* 2014;65:490-6.
- Castillo R, Buckel E, León F, Varas J, Alvarado J, Achurra P, Aggarwal R, et al. Effectiveness of learning advanced laparoscopic skills in a brief intensive laparoscopy training program. *J Surg Educ.* 2015;72:648-53.
- Asano TK, Soto C, Poulin EC, Mamazza J, Boushey RP. Assessing the impact of a 2-day laparoscopic intestinal workshop. *Can J Surg.* 2011;54:223-6.
- Okrainec A, Smith L, Azzie G. Surgical simulation in Africa: the feasibility and impact of a 3-day fundamentals of laparoscopic surgery course. *Surg Endosc.* 2009;23:2493-8.
- Dominguez EP, Barrat C, Shaffer L, Gruner R, Whisler D, Taylor P. Minimally invasive surgery adoption into an established surgical practice: impact of a fellowship trained colleague. *Surg Endosc.* 2013;27:1267-72.
- Kolla SB, Gamboa AJ, Li R, Santos RT, Gan JM, Shell C, et al. Impact of a laparoscopic renal surgery mini-fellowship program on postgraduate urologist practice patterns at 3-year follow-up. *J Urol.* 2010;184:2089-93.

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