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Original Article

General surgeons' approach to laparoscopic inguinal hernia surgery and training expectations in Turkey: A web-based survey

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Abstract

Aim: In this study, we aimed to determine the approach of general surgeons toward laparoscopic inguinal hernia surgery and training needs of surgeons and to collate data that will help formation of training programs or the development of current training programs.
Material and Methods: A survey study was designed with 15 questions, including questions regarding determination of characteristics of their trainings, surgical preferences, and their knowledge and approach toward laparoscopic inguinal hernia surgery. General surgeons in Turkey invited to study on a voluntary basis by using Turkish Surgical Association's official website.
Results: A total of 160 surveys were completed included to the study. Of the total participants, 54.4% included laparoscopic hernia surgery in their daily applications. It was observed that most prevalently used surgical method (60.9%) was total extraperitoneal approach. Of 73 participants, 39 (52.8%) who did not include laparoscopic inguinal hernia surgery into daily surgical procedures stated that they inform the patients about laparoscopic inguinal hernia surgery during the pre-operative evaluation. The rate of performing laparoscopic inguinal hernia surgery was found to be lower among those who had been working for ≥10 years ($p = 0.001$). Moreover, it was observed that only 18 (34.6%) of the 52 participants, who had been working for ≥10 years and who did not include laparoscopic hernia repair into their daily surgical procedures, wanted to receive training.
Conclusion: General surgeons have a difference of opinion on the benefits of laparoscopic inguinal hernia repair. It is necessary to determine the obstacles for laparoscopic inguinal hernia surgery to be performed prevalently. Academic institutions designing and bringing the training programs into action can help inform surgeons who want and need the trainings, and success can be obtained in shortening the time the learning curve takes and lowering of the recurrence and complication rates by continuous medical training programs conducted routinely.

Keywords: Inguinal Hernia; Laparoscopy; Medical Education; Surgical Education.

INTRODUCTION

Inguinal hernia surgery is one of the most prevalently performed surgical procedures with frequent variations in terms of restoration methods (1). Laparoscopic inguinal hernia repair has not been widely accepted among surgeons despite the new positive developments created by it in the treatment of patients (2), and it only constitutes 15%–20% of hernia operations around the world (3-6). The main reasons for this avoidance are that the surgical procedures associated with inguinal hernia repair have a long learning curve (7), there are difficulties due to working in an unordinary anatomic region, there is a risk of facing more severe complications compared to open hernia repair (8), and the operation is performed under general anesthesia (9). However, the rates of laparoscopic inguinal hernia repair are showing a slow increase over the years, and the laparoscopic method (10) has become preferable for patients with bilateral and/or recurrent inguinal hernia (11-14).

European Hernia Society published a guideline regarding laparoscopic and open inguinal hernia repair in 2009. The guideline recommends the primary use of laparoscopic approach in female patients, bilateral inguinal hernias, and recurrent hernias after anterior approach repair. However, it recommends open repair with graft in patients with prior abdominal surgery history, large scrotal hernias,

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and in cases with general anesthesia contraindications. The guideline recommends open repair with graft or repair with laparoscopic approach depending on the expertise of the surgeon in primary, unilateral inguinal hernias (2). However, it is unclear whether these and similar guidelines are followed by the surgeons or whether they change the experiences acquired by the surgeons during their previous educations and surgical practice applications.

The primary objective of this study was to determine the approach of general surgeons toward laparoscopic inguinal hernia surgery. The secondary objective was to determine the training needs of surgeons and to collate data that will help the formation of training programs or the development of current training programs.

MATERIAL and METHODS

In this survey study, general surgery experts working in academic, public and private institutions in Turkey were selected as a target audience. The survey questions and design were prepared by the general surgery clinic of Okan University Hospital. "The approach of general surgeons toward laparoscopic inguinal hernia operations survey" comprised 15 questions, including questions regarding the determination of characteristics of their trainings, surgical preferences, and their knowledge and approach toward laparoscopic inguinal hernia surgery.

The link of the survey was available between June 2017 and June 2018 at the http://docs.google.com (Mountain View, California, USA) web address and was published in the 34th weekly newsletter of the Turkish Surgical Association's official website. Incomplete surveys were excluded from the study.

The study was carried out in accordance with the Helsinki Declaration

Study end points

There are 3719 general surgeons registered in the database of Turkish Surgical Association. In this study, the number of samples required to reach 80% power was calculated as 351 participants. The primary end point of this study was 351 participants. If the target number of participants could not be reached, it was decided to bring the study to the end of the first year.

Statistical analysis

Statistical analyses were performed using Number Cruncher Statistical System 2007 (Kaysville, Utah, USA). The study data were evaluated using descriptive statistical methods (Frequency, Rate). Qualitative data were compared using Pearson Chi-Square and Fisher–Freeman–Halton tests. $p < 0.05$ was considered to be significant.

Ethical Approval: Ethic committee of Istanbul Okan University also approved the study protocol (09.01.2019/102).

RESULTS

The survey was answered by 182 general surgeons. A total of 160 surveys were fully completed, and 22 (12%) surveys were excluded from the study due to incompleteness. Further, 56.9% of the participating doctors had surgical experience of ≥10 years, 45% of the participants stated that they work at a training hospital (university hospital, training and research hospital, private university hospital), and 56% stated that they work in the most populated cities of Turkey (Istanbul, Ankara, and Izmir) (Table 1).

Of the total participants, 54.4% included laparoscopic hernia surgery in their daily applications. It was observed that the most prevalently used surgical method (60.9%) was total extraperitoneal approach (Table 2).

Of 73 participants, 39 (52.8%) who did not include laparoscopic inguinal hernia surgery into daily surgical procedures stated that they inform the patients about laparoscopic inguinal hernia surgery during the pre-operation evaluation.

It was observed that 15 of 95 participants who had laparoscopic hernia surgery training did not include laparoscopic inguinal hernia surgery into their daily surgical procedures, and further, 6 of these 15 participants reported that laparoscopic inguinal hernia surgery could not be performed due to inadequate technical equipment.

When the participants were asked whether they would like to receive laparoscopic inguinal hernia training, the rate of willingness to receive training among those working at university hospitals was found to be lower than those working at state hospitals or private institutions ($p = 0.030$) (Table 3, Figure 1). Moreover, the rate of retraining among those who received training by participating in congresses and courses was found to be higher than those who received training during their residency trainings and in through other formats ($p = 0.046$) (Table 3, Figure 2).
The rate of willingness to receive training among those who used a single surgical method was found to be higher than those who used all surgical methods based on the condition of patients ($p = 0.002$) (Table 3, Figure 3). The rate of willingness to receive training in participants who continued surgery by switching to open surgery following the failure of laparoscopic hernia surgery was found to be higher than those who continued the operation by switching to another laparoscopic method ($p = 0.028$) (Table 3, Figure 4).

The rate of performing laparoscopic inguinal hernia surgery based on the years of experience is shown in table 4. The rate of performing laparoscopic inguinal hernia surgery was found to be lower among those who had been working for ≥10 years compared to those who had been working for <10 years ($p = 0.001$) (Table 4). Moreover, it was observed that only 18 (34.6%) of the 52 participants, who had been working for ≥10 years and who did not include laparoscopic hernia repair into their daily surgical procedures, wanted to receive training.

Table 1. Characteristics of the doctors' institutions and cities where they received training or worked

Work and Training Characteristics		n	%
Experience	≥10 years	91	56.9
	<10 years	69	43.1
Institution of employment	UH	16	10.0
	PUH	18	11.3
	TRH	38	23.7
	SH	64	40.0
	PI	24	15.0
City of employment	Istanbul	66	41.3
	Ankara	10	6.2
	Izmir	14	8.8
	Other	70	43.7
Institution of general surgery expertise training	UH	54	33.8
	PUH	11	6.8
	TRH	95	59.4
City of general surgery exper-tise training	Istanbul	83	51.9
	Ankara	36	22.5
	Izmir	11	6.9
	Other	30	18.7

UH: University hospital, PUH: Private university hospital, TRH: Training and research hospital, SH: State hospital, PI: Private institution

Table 2. General approach towards hernia surgery of the participating doctors

		n	%
Number of annual hernia surgeries performed	<50	53	33.1
	50–100	51	31.9
	>100	56	35.0
Laparoscopic inguinal hernia surgery training received	Yes	95	59.4
	No	65	40.6
Method of training (n = 95)	Expertise training	73	76.8
	Participating in congresses and courses	12	12.7
	Other*	10	10.5
Adequate technical equipment for laparoscopic inguinal hernia surgery in the institution of employment	Yes	140	87.5
	No	20	12.5
Whether they perform laparoscopic inguinal hernia surgery	Yes	87	54.4
	No	73	45.6
Most prevalently used surgical method (n = 87)	TEP†	53	60.9
	TAPP†	11	12.7
	iPOM†	1	1.1
	All according to the state of the patient	22	25.3
Method performed after failed intervention (n = 87)	Open surgery	56	64.4
	Another laparoscopic method	31	35.6

*The participant who learned from surgeons performing this surgical procedure in the institutions they worked in after having received trainings on applications related to laparoscopic inguinal hernia surgery
†TEPP/TAPP/İPOM: Total extraperitoneal approach/Transabdominal preperitoneal approach/Intraperitoneal onlay mesh technique

Table 3. Evaluations Based on Willingness to Receive Training on Laparoscopic Inguinal Hernia Surgery

		Willing to receive training (+) n (%)	Not willing to receive training (−) n (%)	p
Institution of employment	UH	1 (6.3)	15 (93.7)	[a]0.030*
	PUH	6 (33.3)	12 (66.7)	
	TRH	13 (34.2)	25 (65.8)	
	SH	30 (46.9)	34 (53.1)	
	PI	12 (50.0)	12 (50.0)	
Type of training received on laparoscopic inguinal hernia surgery (n = 95)	During expertise training	27 (37.0)	46 (63.0)	[b]0.046*
	By participating in congresses and cours-es	9 (75.0)	3 (25.0)	
	Other*	3 (30.0)	7 (70.0)	
Most frequently used surgical method in laparoscopic inguinal hernia surgery (n = 87)	TEPP/TAPP/iPOM†	33 (50.8)	32 (49.2)	[a]0.002**
	All	3 (13.6)	19 (86.4)	
Method performed following failed intervention (n = 87)	Open surgery	28 (50.0)	28 (50.0)	[a]0.028*
	Another laparoscopic method	8 (25.8)	23 (74.2)	
Experience	≥10 years	34 (37.3)	57 (62.6)	[a]0.73*
	<10 years	24 (34.7)	45 (65.2)	

[a]Pearson Chi-Square Test, [b]Fisher Freeman Halton Test, *p < 0.05, **p < 0.01
UH: University hospital, PUH: Private university hospital, TRH: Training and research hospital, SH: State hospital, PI: Private institution
†TEPP/TAPP/iPOM: Total extraperitoneal approach/Transabdominal preperitoneal approach/Intraperitoneal onlay mesh technique
*Participant who learned applications regarding laparoscopic inguinal hernia surgery from the surgeons who performed this surgical operation in the institutions they work in following their expertise training

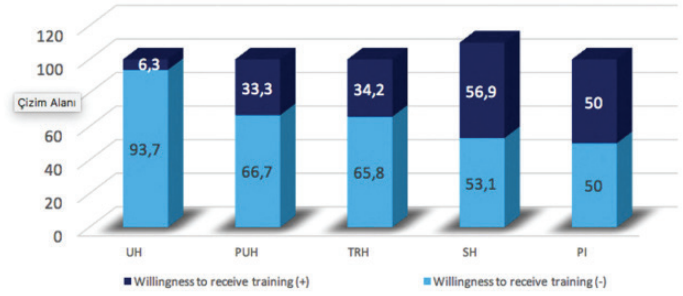

Figure 1. Distribution of willingness to receive training regarding laparoscopic hernia surgery based on the institutions

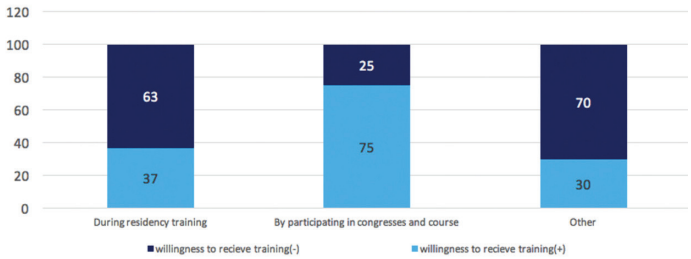

Figure 2. Distribution of willingness to receive training laparoscopic hernia surgery again according to the type of training received of the participants who previously received laparoscopic inguinal hernia surgery training

Figure 3. Distribution of willingness to receive training based on the most frequently used method in laparoscopic inguinal hernia surgery

Figure 4. Distribution of willingness to receive training based on the method performed after a failed laparoscopic intervention

Table 3. Evaluations Based on Willingness to Receive Training on Laparoscopic Inguinal Hernia Surgery

		Work duration		p
		≥10 years	<10 years	
Performing laparoscopic inguinal hernia surgery	Yes	39 (42.9)	48 (69.6)	[a]0.001**
	No	52 (57.1)	21 (30.4)	
[a]Pearson Chi-Square Test		**p < 0.01		

DISCUSSION

It is not surprising that general surgeons at the beginning of their careers are more willing to perform laparoscopic inguinal hernia repair. Because they are more familiar with laparoscopic procedures during surgical training at earlier ages, their probability of performing laparoscopic inguinal hernia repair is higher (14,15). The rate of performing laparoscopic inguinal hernia operation by senior general surgery residents in the United States of America has shown an increase in the last 2 decades (16,17). Although a decrease of 12.5% was reported on open hernia repairs performed by surgical residents during their trainings in the United States of America between 1999 and 2008, an increase of 87.5% was detected in the number of laparoscopic repairs (18). In our study, especially the willingness to perform laparoscopic inguinal hernia surgery of general surgeons who had been working for ≥10 years was found to be lower than those who were at the beginning of their careers (p = 0.001). These results are compatible with the literature and show that the rate of laparoscopic inguinal hernia repair among new generation surgeons has increased.

Almost half of the participating general surgeons stated that they had never performed laparoscopic inguinal hernia surgery. Similar results were reported in the surveys conducted in various countries (17,19,20). In two studies based in Denmark and United States of America, this rate was higher than 75% (4,9,17).

Laparoscopic inguinal hernia repair is a challenging procedure for surgeons and has a long learning curve (6,8). European Hernia Society stated that the learning curve for laparoscopic inguinal hernia repair is much longer than that for open surgery and varies between 50 and 100 cases (2). We believe that the main obstacle faced by general surgeons, who have been working for ≥10 years is the lack of necessary training. In our study, it was observed that only 18 (34.6%) of 52 participants who had been working for ≥10 years and who did not include laparoscopic hernia repair into their daily surgical procedures wanted to receive training. We believe that the reason why these surgeons have a low willingness to receive training is that the laparoscopic inguinal hernia repair has a long learning curve and the complication rates of the laparoscopic methods throughout the training are higher than those of open surgery methods (2,6,8).

We believe that continuous medical education programs can prevent information and surgical skill gaps that are possible to occur in one or two decades. Many new methods can be learned, complication and recurrence rates can be decreased, and the use of these new surgical methods can be made more prevalent with trainings provided by an expert qualified in the field. Society of American Gastrointestinal and Endoscopic Surgeons published various guidelines to integrate further laparoscopic procedures, such as laparoscopic inguinal hernia repair, into continuous medical education programs and recommended that surgeons working in

non-academic institutions have an information exchange with an expert by contacting faculties of medicine (21). In our study, we detected that the willingness to receive training was higher among the surgeons who were not employed in an academic institution and who had not received training on laparoscopic inguinal hernia repair methods during their trainings in comparison to others (p = 0.003 and p = 0.0046, respectively). We believe that this is an indirect indicator of the need to contact academic institutions and teachers who work in these institutions in compliance with the recommendations of the Society of Gastrointestinal and Endoscopic Surgeons. However, due to the lack of an established continuous medical education program conducted by the Ministry of Health or higher education institutions, it may be difficult to organize training programs on new surgical methods. Moreover, doctors working intensely may be unwilling to allocate time for these practices. Simulation-based training systems may be helpful in decreasing both the time for the learning curve and the anxiety caused by the risk of encountering a surgical complication during the training period (22).

Another interesting finding of this survey was surgeons affiliated with an academic institution (University Hospital, Private University Hospital or Training and Research Hospital) have less desire to get education about laparoscopic hernia repair techniques. We think the reason for this difference may be that the surplus number of surgical cases in academic institutions. The academic institution affiliated surgeons also need to renew themselves constantly for the training of new residents, therefore they are more willing to learn new surgical techniques, and that the surgeons working in academic educational institutions may have less anxiety about salary.

CONCLUSION

It is seen that there is a gap between the practices recommended in the guidelines and the surgeons how perform in real practice. General surgeons have a difference of opinion on the benefits of laparoscopic inguinal hernia repair. It is necessary to determine the obstacles for laparoscopic inguinal hernia surgery to be performed prevalently. Academic institutions designing and bringing the training programs into action can help inform surgeons who want and need the trainings, and success can be obtained in shortening the time the learning curve takes and lowering of the recurrence and complication rates by continuous medical education programs conducted routinely.

Limitations of the study, such as failure to achieve the targeted number of participants. The reason of this failure may be that the laparoscopic inguinal hernia repair is still considered to be less interested by surgeons. On the other hand, we believe that this questionnaire gives very important ideas about general surgeons' approach to laparoscopic hernia surgery and their expectations about education.

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