

# Training of Surgical Residents in Performing Safe Cholecystectomy: Where Do We Stand?

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## ABSTRACT

**Background:** Laparoscopic cholecystectomy is one of the most commonly performed surgeries throughout the world. However, when compared with open technique it requires acquisition of finer skills to perform this procedure, and hence a steep learning curve. Consequently, it is the responsibility of surgical teacher and trainer to teach and train the resident surgeons to do safe laparoscopic cholecystectomy under strict supervision. However, in our country, training of surgical residents is not uniform across the Institutes and consequently surgical experience for trainees much depends on the personal believes and benevolence of the supervisors. With this background we conducted two teaching-hospital-based studies on the learning experience of resident surgeons while assisting and doing laparoscopic cholecystectomy procedure under guidance to find out the diverse practice and scope for further modifications in their training. **Methods:** We performed a cross sectional study with a structured pretested questionnaire documenting the response of fifty one surgical residents based on their experience on laparoscopic cholecystectomy done by them under supervision. **Results:** Most of the residents reported the hepatocystic triangle dissection to achieve the critical view of safety to be very challenging and the minimum number of laparoscopic cholecystectomy they wished to do under supervision before proceeding to do it independently was 20. **Conclusion:** In order to achieve a uniform standard of training, a structured pre fixed training program should be included in the post-graduate curriculum so that after completion of training the young surgeons can perform safe laparoscopic cholecystectomy independently.

**Keywords:** Cholecystectomy, laparoscopy, resident surgeons, training, learning curve.

## INTRODUCTION

Laparoscopy or minimal access surgery is a surgical procedure that utilizes minimal incision and small insignificant scars on abdominal wall for diagnostic and therapeutic purpose. In recent years there has been a revolution in the field of laparoscopic surgery with bits ongoing advancement so that most of the abdominal surgeries can be done by this method for better outcome in terms of post-operative pain, morbidity, early recovery from surgery, early return to work, better cosmetics and rapid bed turnover. But at the same time this method of surgery has its own limitations also, particularly when compared with conventional open surgery. Laparoscopic surgery has a steep learning curve and a narrow margin of safety when performed by beginners.<sup>[1,2]</sup> Consequently it requires an intensive learning period to acquire surgical competency to perform safe laparoscopic surgery and in order to achieve this it is recommended to have simulation based training outside the operating room followed by exposure to live patients to minimize complications.<sup>[3-7]</sup>

Gall stone disease is a very common disorder in our set up and we consider laparoscopic cholecystectomy as the gold standard for gall stone disease.<sup>[8]</sup> Being a teaching institute it is expected that junior resident should have intensive modulated training on laparoscopic surgery, especially, laparoscopic cholecystectomy according to a stipulated guideline during their three year residency.<sup>[9]</sup> However there is no such stipulated guideline about formal training procedure of post-graduate trainee, documentation, evaluation and rectification of difficulties faced by trainee during the learning curve in our country. With this background, we have conducted a study aimed to assess the level of exposure and training experience of surgical residents for their self-assessment of acquisition of surgical skills to perform safe laparoscopic cholecystectomy independently.

## MATERIALS AND METHODS

A cross sectional survey consisting of a structured pre tested questionnaire containing 21 items was given to resident surgeons after attaining ethical and scientific committee clearance. USG proved gall stone disease with ASA grade 1 or 2 with clinical, radiological and biochemical parameters in favour of anticipated uncomplicated cholecystectomy were allotted to surgical residents. Residents' experiences were documented using a questionnaire based on

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dichotomous or linkert-type or ordinal constructs. The complete surgical procedure was divided in three parts and residents' experiences were evaluated by their proficiency in doing those three parts using particular technical variants. Residents' satisfaction level were evaluated indirectly from their expressed comfort level and minimum number of cases they think they need to do to acquire the confidence to perform the cases independently.

## RESULTS

### Demographic characteristics:

A total no of 51 surgical residents were assigned for evaluation of whom 44 (86%) were male and only 7 (14%) were female. The age range of residents was 24 to 38 years.

### Background training experience of residents:

All the residents have completed at least two years residency in General Surgery. 36 (72%) of them had experiences on endotainers while 15 (28%) started their training directly on the patients.

### Operating room training experience:

All the residents have undergone structured conventional monitored training on laparoscopic surgery starting from assembly of instruments onwards. All of them had at least 6 months training as second assistant before proceeding to camera surgeon and by this time the range of cases they performed as second assistant was 9 to 52 with a median of 15 cases.

After at least 6 months training as camera surgeons they were allowed to do basics of laparoscopic cholecystectomy in steps starting from port placement or veress needle insertion onwards under supervision. At the end of two years the number of cases done by residents stepwise before proceeding to do the entire cholecystectomy were <10 for 17 (33%) residents, 10-20 for 25 (49%) residents, and 21-50 for 9 (17%) residents. 28 (55%) residents reported the incidence of accidental stone spillage as <20%, 21(41%) residents reported the rate of stone spillage more than 20%. 2 (4%) residents did not reply the question.

Of the residents 17 (33%) routinely used abdominal drain even when there was no gall bladder perforation or accidental spillage of stone or excessive per operative hemorrhage. 34 (66%) residents did not use abdominal drain routinely and used it when was indicated. There was no statistically significant difference for use or no use of drain in terms of outcome of patient.

30 (59%) residents routinely used retrieval bags for gall bladder extraction and of them two third used plastic bags and one third used glove-made retrieval bags. Among the residents who routinely used the extraction bags 19 (63%) were comfortable handling the bags. 76% residents believed the routine use of

retrieval bags to be helpful and recommended the same. There was no statistically significant difference with the use of retrieval bags in terms of immediate recovery and short term (6 months) outcome of the patients.

### Self-appraisal of residents:

37 (72%) residents declared that the most challenging step was dissection of hepatocystic triangle to achieve the critical view of safety, for 10 (20%) residents it was the placement of ports and for 4 (8%) residents it was the dissection of gall bladder from cystic plate which appeared to be most challenging.

34 (66%) residents believed that minimum no of cases to be done under supervision before doing laparoscopic cholecystectomy independently was approximately 20. For 4 (8%) residents the number was approximately 10 cases and another 9 (18%) residents believed they needed to do more than 20 cases before they could proceed for safe laparoscopic cholecystectomy independently. Although 43 (84%) residents believed they needed to perform at least 20 cases under supervision before they could proceed with laparoscopic cholecystectomy independently only 26 (51%) residents' experience matched their expectations. So we can conclude that one third of our residents remained unsatisfied in training in terms of the number of laparoscopic cholecystectomy cases they thought they needed to do to achieve proficiency and safety level.

## DISCUSSION

Basic laparoscopic surgery as defined by Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) include diagnostic laparoscopy, laparoscopic appendectomy and laparoscopic cholecystectomy. SAGES also recommend graduated supervised learning of psychomotor skills of laparoscopy by trainee surgeons.<sup>[10]</sup> However in most of our teaching institutions there is no pre fixed structured curriculum for basic training of laparoscopic surgery for the surgical residents and in many cases such training is very much dependent on the willingness of senior surgeons and mentors. Moreover there is inadequate availability of endotrainer, simulation models, laparoscopic trainer boxes for pre operating room training.<sup>[11,12]</sup> Consequently junior surgeons after completion of their residency experience a lot of difficulties to perform laparoscopic cholecystectomy independently and safely leading to complications, increased morbidity, mortality, financial constraints resulting in poor doctor patient relationship. All of these can be nullified to a great extent by a systemic, uniform and structured training during the period of surgical residencies.<sup>[13]</sup>

In our study, most of the residents (72%) had some experience about the basic laparoscopic surgery procedures before they had hands-on training on patients. All of them were given a structured step wise supervised training. Most of the residents had a smooth learning curve. They faced difficulties in three crucial steps of laparoscopic cholecystectomy; viz- placement of ports, dissection of hepatocystic triangle to achieve critical view of safety and separation of gall bladder from cystic plate and also in handling the retrieval bags. All of these technical issues were gradually improved under supervision and finally all of our residents were successful to do laparoscopic cholecystectomy independently but under close supervision. Our study helped them recognize their own deficiencies and will be useful for the supervisors to plan training of the residents in a more explicit and uniform way.

#### **Limitations of the study:**

The framework of this study is based on responses given by surgical residents and bias in responses can't be ruled out. Furthermore this study is based on residents of two institutions only and hence it lacks power to recommend desired changes in current training pattern.

### **CONCLUSION**

Basic training of laparoscopic surgery including laparoscopic cholecystectomy should be included in the curriculum of post graduate training of surgical residents. It should be structured, uniform, supervised and updated from time to time. Feedback given by the trainee should be analysed meticulously for better training. Pre operating room training in the form of endotrainer, simulation models, laparoscopic trainer boxes should be encouraged. Residents should also be encouraged to attend workshops and seminars on laparoscopic surgery to have an idea about state of the art and periodic self-appraisal to sharpen their expertise. We feel the need of more such studies with involvement of residents from across the country to plan some minimum standard guidelines for hands-on training for the postgraduate residents which will be feasible to follow in the Institutes of our country almost universally.

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