

## Minimal access surgery training of general surgical residents in Karachi, Pakistan; where do we stand?

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### ABSTRACT

**Objective:** To evaluate post graduate surgical residents' training in minimal access surgery.

**Methodology:** This cross sectional survey was based on a 16-item self reporting questionnaire that was provided to 48 third, fourth and fifth year postgraduate general surgical trainees doing residency in seven Karachi institutions accredited by College of Physicians and Surgeons Pakistan for Fellowship training. All 48 trainees completed and returned the given questionnaire.

**Results:** Eleven were 3<sup>rd</sup> year, 33 were 4<sup>th</sup> year and four trainees were 5<sup>th</sup> year residents. Mean age of the trainees was 30.31(SD 2.8) years (range 27 to 43), Males were 35 (72.92%), females were 13 (27.08%). Forty six (95.83%) answered that laparoscopic surgery was performed in their department, while two (4.17%) replied in negative. Nine (18.75%) said that they had performed Laparoscopic Cholecystectomy under supervision, while 39 (81.25%) responded "no". Regarding "Dry Lab" access 18(37.5%) responded "yes" while 30 (62.5%) said no. Similarly regarding "Wet Lab" none said "yes", all (100%) responded by saying "No" as was the case of Virtual Reality Simulator where 45 (93.75%) said "No" while three (6.25%) did not answer this question and none responded "Yes". Out of the 48 trainees questioned only nine (18.75%) had ever attended a Basic Laparoscopy workshop while 39 (81.25%) had not. Trainees own perception regarding their skills and status in laparoscopic surgery training was such that none said Excellent, 7(14.58%) said Good, eight (16.67%) labelled themselves as Average while nine (18.75%) thought they were below average, 23 (47.92%) said they were Poor in this Skill and one(2.08%) did not respond. Most 41 (85.42%) would prefer to do a One Year Fellowship in Minimal Access Training following FCPS, while one(2.08%) said "No" and six (12.5%) were not sure.

**Conclusion:** Education and training in Minimal Access Surgery within Institutions of Karachi is not standardized and access to training facilities is limited.

**KEY WORDS:** Minimal Access Surgery, Skills, Education, Trainees, Surgical Training.

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## INTRODUCTION

Minimal access surgery is performed through two dimensional visual feedbacks and without direct touch sensitivity. This demands that surgeons adapt to and develop new and improved visual-motor skills. These abilities can only be learned, developed, and maintained through training.<sup>1,2</sup> Various researchers<sup>3,4</sup> have in the past pondered over the need for structured training in this area and many<sup>5</sup> have in the past asked the question regarding competencies of surgeons performing laparoscopic Cholecystectomy.

Rosser<sup>6</sup> in 1998 objectively assessed two hundred ninety-one trained surgeons who were given over eight thousand standardized laparoscopic dexterity drills and around two thousand nine hundred intracorporeal suturing exercises in the Yale Laparoscopic Skills and Suturing Program and concluded that basic skills relevant to laparoscopic performance can be acquired with a high level of competence in a brief course unrelated to prior surgical experience, gender, or age.

Various authors within Pakistan have looked at various aspects of minimal access surgery like management of difficult cases<sup>7</sup>, as a diagnostic modality<sup>8,9</sup>, use in evaluation of chronic pain<sup>10</sup>, newer techniques like laparoscopic appendectomies<sup>11</sup> and hernia repair.<sup>12</sup> Recently Asghar and co-workers<sup>13</sup> looked at the stress endured by patients during open and laparoscopic cholecystectomies.

Minimal access surgical training and its evaluation has been an area which is yet to be explored and in light of the same this study was carried out.

## METHODOLOGY

A 16-item self reporting questionnaire was provided to 48 third, fourth and fifth year postgraduate surgical trainees doing residency in seven Karachi institutions accredited by College of Physicians and Surgeons Pakistan, these were the only institutes within Karachi where senior residents were available at the time of survey thus leading to a small sample size. Also at the time the study was conducted no specialist centre was available for Minimal Access Surgery (MAS) training in Karachi and the only exposure to MAS for these trainees was during their general surgical training in these institutions All 48 completed and returned the given questionnaire.

All questions asked had identified responses. The first two questions were about the availability and frequency of laparoscopic surgery in the unit. Questions 3 to 6 related to the frequency of laparoscopic cholecystectomies in the training unit where the trainee worked and the training status of the trainee in view of laparoscopic cholecystectomy. Questions 7, 8 and 9 were about Dry Labs, Wet Labs and Virtual Reality simulators. Questions 10 and 11 enquired about training workshops. Exposure to laparoscopic procedures other than Laparoscopic Cholecystectomy was queried in questions 12 to 14. Question number 15 was regarding trainees own perception of their current status of laparoscopic training. The final question was related to possible advanced training in minimal access surgery. Table-I

The institutions from where data was gathered, as mentioned before, are accredited institutions for Fellowship training in General Surgery and the number of trainees from each institution is not mentioned so as to maintain confidentiality. The data was entered onto an Excel Sheet and analyzed for frequency and percentages.

## RESULTS

A total of 48 trainees were given the questionnaire and all completed and returned it. Eleven residents were in their 3<sup>rd</sup> year residency while 33 were in the 4<sup>th</sup> year of their residency program and 4 trainees were doing 5<sup>th</sup> year residency. Mean age of the trainees was 30.31(SD 2.8) years (range 27 to 43), Males were 35 (72.92%) while 13 (27.08 %) were females.

In response to the first question 46 (95.83%) answered that laparoscopic surgery was performed in their department, while two (4.17%) replied that laparoscopic surgery was not carried out. Regarding number of cases 15 (31.25%) said less than 10 cases were performed in a calendar month while 17 (35.42%) said between 10 & 20 cases underwent minimal access surgery whilst 14 (30.5%) replied that more than 20 patients had laparoscopic surgery in their unit. To the question regarding Laparoscopic Cholecystectomy being attempted in all cases out of 46 trainees questioned 24 ( 52.2%) said yes while 22 (47.8%) said no.

In response to the question No. 4 as to if the trainees had performed laparoscopic Cholecystectomy under supervision, nine (18.75%) said yes while 39 (81.25%) responded by saying no, out of these nine two (4.17%) had performed more than 30 procedures, two (4.17%) had done between 10 to 30 while five (10.42%) had done less than 10 whereas out of those trainees who had not performed a complete procedure four (8.33%) said they had observed while 22 (45.83%) had assisted and 11 (22.9%) had partly performed a Laparoscopic Cholecystectomy.

In response to questions regarding "Dry Lab" (Endotrainers, Simulators) availability in the department 18 (37.5%) responded "yes" while 30 (62.5%) said no. Similarly regarding "Wet Lab" (Animal, Cadaver) none said "yes", all (100 %) responded by saying "No" as was the case of Virtual Reality Simulator where 45 (93.75%) said "No" while 3 (6.25 %) did not answer this question and none responded "Yes".

Out of the 48 trainees questioned only nine (18.75%) had ever attended a Basic Laparoscopy workshop while 39 (81.25%) had not attended any such skills session.



Year Fellowship in Minimal Access Training after completion of FCPS; 41 (85.42%) said yes they wanted to do a fellowship while one (2.08%) said "No" and six (12.5%) were not sure.

## DISCUSSION

Training of surgeons has followed the technological advances made over the years. Martinez and coworkers<sup>14</sup> in 2007 developed a novel magnetic home system for training in minimal access surgery. This study conducted showed that a greater than 80% of trainees had not performed Laparoscopic Cholecystectomy and when questioned about the number of procedures, a total of two (4.17%) trainees had done more than 30 procedures, two (4.17%) had done between 10 to 30 procedure and five (10.42) trainees had carried out less than 10 laparoscopic cholecystectomies (LCs). This is in contrast to the study by Liberman<sup>15</sup> which showed that the graduating resident averaged 95 laparoscopic cholecystectomies. In the study group 37 out of 48 trainees were in their final year of training. Published studies on Laparoscopic surgery is available to some extent locally yet no material on training in Minimal Access Surgery (Laparoscopic Surgery) was found despite web and journal search, so it was difficult for the authors to compare results in this regard

In the 1993 study<sup>16</sup> from Iowa it was seen that the rate of complications associated with the clinical learning curve can be decreased by additional education following an initial course in laparoscopy. Torkington<sup>17</sup> in 2001 showed that all parameters of laparoscopic skills improved significantly after attending a training course, with the exception of distance travelled by the instruments. All outcome measures were significantly improved at 3 weeks. The kinematic data was analyzed using the Imperial College Surgical Assessment Device. This was in comparison to a group of controls who underwent no training. Jakimowicz and Cuschieri<sup>18</sup> in their editorial in 2005 pointed out the need for structured training in Minimal Access Surgery. From the presented study it was seen that out of the 48 trainees only 9 (18.75%) had ever attended a Basic Laparoscopy workshop while 39 (81.25%) had not attended any such skills session despite most of them were near completion of their training.

The use of Endo trainers and Virtual simulators has become a cornerstone of Minimal Access training as shown by Grantcharov<sup>19</sup>, Seymour<sup>20</sup>, Andreatta<sup>21</sup> and Aggarwal<sup>22</sup> in their randomized clinical trails. The need for the use of this modality has been shown to be mandatory in the training curriculum for minimal

access surgery. In the current study majority of trainees 30 (62.5%) out of 48 did not have access to Endotainers and none i.e. 48 out of 48 did not have any exposure to a "Wet Lab" (Animal, Cadaver) during their training. Similarly none of the trainees responded in affirmative to the availability of Virtual Reality Simulator during training.

Encouraging was the fact that more than half the trainees had exposure to Laparoscopic Appendicectomy yet only 4 (8.33%) had performed it under supervision. Exposure of trainees to other laparoscopic procedures was varied with the highest response for diagnostic laparoscopy followed by Inguinal Hernia repair, Ventral hernia, colorectal surgery and upper G.I surgery.

An interesting though probably not unexpected fact was the trainees own perceptions regarding their skills and status in laparoscopic surgery training, none felt it was excellent, 7(14.58%) said good, 8 (16.67%) labelled themselves as average while 9 (18.75%) thought they were below average, 23 (47.92%) said they were poor in this skill and 1(2.08%) did not respond to the question. This certainly is food for thought for all concerned.

Birch<sup>23</sup> showed that a comprehensive course in advanced minimal access surgery has a positive impact on attendees' knowledge and skills. This perception of incomplete training was probably why an overwhelming majority of trainees 41 (85.42%) preferred to do a One Year Fellowship in Minimal Access Training after completion of FCPS, while 1 (2.08%) said "No" and 6 (12.5%) were not sure.

Aggarwal<sup>24</sup> showed the need to develop an indigenous evidence-based virtual reality laparoscopic training curriculum for novice laparoscopic surgeons to achieve a proficient level of skill prior to participating in live cases. Segan<sup>25</sup> stressed on efforts that should be aimed at creating valid training and assessment paradigms that can be applied by the broadest group of trainees, from medical students to surgeons, in active practice. Ji-Hui and coworkers<sup>26</sup> looked at the changes in Laparoscopic Surgery Education in China over a 15 year period and the use of indigenous techniques in developing the local education systems. Also perhaps the development of a database for clinical research and training in minimal access surgery could be developed.<sup>27</sup>

## CONCLUSION

Education and training in Minimal Access Surgery within Institutions of Karachi is not standardized and access to training facilities is limited.

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