Research Article

Laparoscopic surgery as a beginner in a new rural institute: single surgeon experience

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ABSTRACT

Background: Laparoscopic surgery has become indispensable for all surgical procedures worldwide. Every surgeon wants to master the art of laparoscopic surgery as quickly as possible, but has to go through a 'learning curve' for almost all procedures-basic or advanced.

Methods: The study was conducted on all the patients admitted under a single surgeon through outdoor in the department of Surgery, who underwent elective laparoscopic surgery during July 2008 to July 2010 (2 years) in UPRIMS & R, Saifai, Etawah. Various laparoscopic procedures were performed under adequate anaesthesia after proper convincing and informed consent.

Results: In the present study undertaken at UP Rural Institute of Medical Sciences and Research, Saifai over the period of two years in the department of surgery by a single surgeon, 398 (three hundred seventy eight) patients underwent different laparoscopic procedures. Among all cases, laparoscopic cholecystectomy was the commonest procedure performed (325 cases, 85.97%) followed by laparoscopic appendectomy (30 cases, 7.93%).

Conclusions: Laparoscopic surgery is here to stay and success in it is determined by how quickly and effectively we learn. However certain measures may be taken to lessen some of the adverse effects of the learning curve and others to help laparoscopic surgeons ease into the specialist.

Keywords: Laparoscopic surgery, Beginner, Rural institute

INTRODUCTION

Laparoscopic surgery has become indispensable for all surgical procedures worldwide. Every surgeon wants to master the art of laparoscopic surgery as quickly as possible, but has to go through a 'learning curve' for almost all procedures-basic or advanced. The so called, 'learning curve' (operative experience) depends on multitude of factors for every surgeon in their workplace.¹ At least, for today's surgeon, sky is the limit for creative enterprise, so, let us seize the moment and move our specialties forward in a way and on a scale that may not happen again for many generations.

METHODS

The study was conducted on all the patients admitted under a single surgeon through outdoor in the department of Surgery, who underwent elective laparoscopic surgery during July 2008 to July 2010 (2 years) in UP Rural Institute of Medical Sciences and Research, Saifai, Etawah. Various laparoscopic procedures were performed under adequate anaesthesia after proper convincing and informed consent.

The instrumentation used was basic laparoscopy set available (3-chip camera from ILO, Germany and hand instruments by Om Surgicals) in our surgery operation theatre. Veress needle for initial creation of

pneumoperitoneum. Laparoscopes-10 mm and 5 mm diameter, both 0° and 30° as per need. The energy source used was electrocautery-monopolar (Johnson) and harmonic scalpel (Ethicon). The risks of the laparoscopic operation were fully explained to the parents of the children, which included post-operative infection, bleeding, failure of pyeloplasty, the need to convert to open surgery, damage to other viscera and adhesion formation.

After observation and results were derived from the study conducted during last two years, the results were subjected to proper statistical analysis, thereby drawing conclusions from the study.

Aim of the study

The basic aim of the study conducted over the period of two years was to assess the following parameters on the procedures performed laparoscopically;

- Feasibility
- Alternative feasibility of assisted laparoscopic intervention

- Successful completion
- Operative time
- Intra-operative difficulty
- Conversions
- Complications/post-operative events
- Duration of hospital stay

Apart from assessment of the above listed parameters, analysis was done in terms of 'learning curve' for each procedure as a beginner in laparoscopic surgery in new rural institute and methods to maintain the 'steepness of learning curve' in the future endeavours.

RESULTS

In the present study undertaken at UPRIMS&R, Saifai over the period of two years in the department of surgery by a single surgeon, 398 patients underwent different laparoscopic procedures.

Table 1: Various procedures undertaken by laparoscopy.

Procedure	No. of cases	Laparoscopic	Converted	Mean operative time (min)	Hospital stay (in days)
Cholecystectomy	330	327	3	22	2
Appendectomy	30	30	-	28	3
Hernia (TEPP)	2	2	-	110	3
Incisional hernia	8	8	-	50	3
Pyelolithotomy	2	-	2	105	5
Ovarian cystectomy	1	1	-	45	3
Splenectomy	1	-	1	135	7
Rt. Hemicolectomy (Assisted)	2	-	-	130	8
Nephrectomy	1	1	-	180	4
CBD exploration	2	2	-	90	7
Rectopexy	1	1	-	105	5
SEPS	7	7	-	45	3
SILC (Single Incision Lap Chole)	6	6	-	100	2
TILC (Two Incision LC)	3	3	-	95	2
Renal cyst deroofing	1	1	-	35	3

Table 2: Intra-operative complications in laparoscopic Cholecystectomy.

Complications*	No. Of cases
Perforation of gall bladder	2
Spillage of bile	4
Spilled stones	3
Soiling of port site while retrieval	5
Slipped cystic duct ligature/clip	0
Cystic artery bleeding	2

*More than one complication observed in seven cases.

Among all cases, laparoscopic cholecystectomy was the commonest procedure performed (325 cases, 85.97%) followed by laparoscopic Appendectomy (30 cases, 7.93%). Two conversions of laparoscopic Cholecystectomy to open were in the initial 20 cases due dense adhesions and difficulty in proper delineation of Calot's triangle.

Mode of specimen retrieval in laparoscopic assisted right hemicolectomy was through a 3 cm transverse incision placed in the right flank and extra-corporeal stapler ileo-transverse anastomosis was performed. In conventional laparoscopic cholecystectomy, specimen was retrieved through epigastric port site while in TILC and SILC/SILS gall bladder was removed through the umbilicus.

Main intra-operative complication in laparoscopic splenectomy and pyelolithotomy was bleeding from the hilum which led to conversion to open in those cases.

Table 3: Post-operative complications in laparoscopic Cholecystectomy.

Complications	No. of cases
Prolonged drainage	0
Prolonged ileus	2
Nausea/vomiting	5
Subhepatic collection	0
Wound infection	2
Postoperative fever	0
Jaundice	0

DISCUSSION

The study included 378 patients of different pathologies who were registered over 2 years (July 2008 to July 2010) under the author's care in the department of surgery, UPRIMS&R, Saifai, Etawah.

All these patients underwent elective laparoscopic procedures of different magnitude under proper anaesthesia after informed consent. Some of procedures were familiar to the surgeon while the rest were attempted for the first time in this institute. Aim was to increase the dexterity in laparoscopic surgery and to compare and analyse the results with other contemporary studies and to assess their outcome on the previously listed parameters.

A learning curve is needed to decrease conversions and bowel injuries during LVHR. The improved experience could permit the treatment of larger defects.

Laparoscopic cholecystectomy was the most common procedure done among all the cases. As the operating surgeon I did assist in a few cases during my senior residency and had done a couple of cases under supervision of my teachers. To start with, conventional laparoscopic cholecystectomy was done in all the cases with 4-ports and application of titanium clips to secure cystic duct and cystic artery. Initially, in 20-30 cases, the operative time was lengthened (45-60 min) due to careful slow dissection and re-evaluation before ligation of cystic duct. Afterwards, the operative time reduced in the range of 30-40 minutes for next 80-100 cases.

The learning curve for lap cholecystectomy in adults ranges from 10 to 75 procedures.² Chang, et al showed that the duration of the operation correlated negatively with the experience of the surgeon.³ For laparoscopic cholecystectomy, improvement persists for about 100 operations, resulting in a 40% reduction in operative time. The primary mechanism of improvement seems to be an ability to deal more effectively with difficult cases.

Laparoscopic CBD exploration is limited by its long learning curve and it is technically demanding.⁴ Transcystic CBD exploration has high success rate and low morbidity.⁵ We performed choledochotomy in both the cases and used a rigid nephroscope for retrieval of CBD stones.

Laparoscopic nephrectomy has been one of the modalities for treatment nonfunctioning kidney.⁶ In our case also it was performed for non-functional kidney.

Laparoscopic colorectal surgery has been used for inflammatory, benign and malignant disease entities and has been shown to reduce postoperative pain and length of hospital stay, provide faster recovery and shown to be cost-effective in comparison to open surgery.⁷ As the demand for laparoscopic colorectal surgery increases, patient selection, case-mix, and laparoscopic outcomes such as conversion rates are expected to vary between surgeons and institutions. Colorectal malignancy managed by laparoscopic procedure has been a subject of intense investigation. Recent date meta-analysis comprising five randomized controlled trials confirmed its acceptable oncological outcome as primary end point and immediate post-operative outcome as secondary end point.^{8,9}

Availability of various modalities like extracorporeal shockwave lithotripsy and percutaneous nephrolithotomy made use of laparoscopic approach minimal for renal stones.¹⁰ In our cases, non-availability of PCNL and large calculi was the indication for laparoscopic approach.

Laparoscopic surgery requires a high degree of special resolution, dexterity, and technical skills. An initial training period is usually required for the majority of surgeons to become proficient in these complex procedures by continuous repetition of these tasks. As a result, one would anticipate that to become technically proficient at laparoscopic colorectal resections may require a longer training period than simpler procedures such as cholecystectomy.¹¹ This initial training period or learning curve often consists of a steep gradient, which varies between surgeons and procedures, representing the rapid change in the ability to complete the task until failure is eliminated or reduced to a minimum constant rate.

CONCLUSION

Laparoscopic surgery is here to stay and success in it is determined by how quickly and effectively we learn. However certain measures may be taken to lessen some of the adverse effects of the learning curve and others to help laparoscopic surgeons ease into the specialist. Setting up of minimal standards and credentialing is a must. Current guidelines in many countries are vague and general. The evidence for training is well documented. The message for individual surgeons is to identify their deficiencies, and chart a way forward for their personal graph of progress. Evaluation and monitoring in a systematic scientific manner will benefit the surgeon with a satisfactory learning curve that will ensure that patient welfare is not compromised. The development of a successful laparoscopic programme can be achieved with a comparatively short learning curve and without detriment to the patient provided the necessary steps are observed. It is important to train the postgraduates and residents so that future laparoscopic surgery is widely available for the common population with a lesser complication and a higher safety margin.

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