

## A structured training programme in laparoscopic cholecystectomy

### Introduction

Laparoscopic cholecystectomy (LC) has become the gold standard treatment for symptomatic cholelithiasis [1]. When performed by a trained surgeon it significantly reduces the post-operative hospital stay and morbidity. However, there is a learning curve and serious complications can occur due to technical error [1], and supervised training is mandatory before a surgeon embarks on laparoscopic surgery. Structured supervised training will reduce the complications while the trainee gains confidence in performing LC [2].

The objective of this study was to evaluate morbidity and mortality in a structured laparoscopic training programme and to indicate steps in LC that require trainer assistance.

### Patients and methods

29 patients (21 females, median age 43 years, ranging from 26 to 54) with symptomatic cholelithiasis underwent LC. Patients were investigated for fitness for anaesthesia laparoscopic cholecystectomy. All patients included in this study had no ultrasound or biochemical evidence of common bile duct pathology. Where ductal stones were suspected endoscopic retrograde cholangiopancreatography (ERCP) was performed before surgery.

Five surgical trainees who had not performed LC were evaluated. Each trainee included in the study should have previously held a laparoscopic camera, learnt the skills of Veress needle insertion and acquired hand-eye coordination on a laparoscopic trainer.

All patients were operated under general anaesthesia with prophylactic antibiotics. A standard 4 port technique with two 5 mm ports and two 10 mm ports was used. The operation was divided into four steps (Table 1). The trainee commenced operation with the trainer as the chief assistant. The trainer intervened when specific assistance was requested by the trainee or where it was deemed essential that the trainer should complete the operation for reasons of safety. The total time taken, steps at which trainer assistance was required,

post-operative pain score assessment, and complications during and after surgery were noted on a proforma.

### Results

Twenty-nine laparoscopic cholecystectomy operations were performed during the study during which trainer assistance was sought on 18 occasions. (Table 1) One procedure (3%) was converted to an open cholecystectomy to establish biliary drainage from a duct of Luschka. One (3%) patient died of pulmonary embolism which was not related to the procedure. Total time taken (median, range) to complete the operation by a trainee was 125 minutes (90–191 minutes). The trainees sought help most during dissection at Calot's triangle to identify important structures such as the cystic duct with its junction at the common bile duct or infundibulum. Least help was sought for insertion of ports. There were no surgical site infections and the median duration of hospital stay was 2 days (range 2–9 days).

### Discussion

We believe that this study will provide useful guidance into the safety of training in LC.

The trainees needed assistance in all the structured steps, but mostly during the dissection of the Calot's triangle. Though not evident in our study, bowel injury is a known complication of using the Veress needle [3], and common bile duct injury and conduction burns using diathermy are serious complications that can occur in laparoscopic surgery [4]. It is essential therefore that the trainer is available for assistance during operation within the Calot's triangle.

The rate of conversion to open cholecystectomy was 3% which is similar to established laparoscopic centres worldwide [5]. There were no major complications that resulted from trainee errors. It is evident in this and other studies that elective LC undertaken by trainees under supervision of a trainer does not increase surgical morbidity, and has a lasting influence on favourable conversion rates and operation time.

We conclude that training in LC can be undertaken in a structured manner. Emphasis should be focused on dissection in Calot's triangle. Furthermore a structured training programme enables goal-setting, providing trainee and trainer feedback that will improve the safety of LC.

### References

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Table 1. Requirement for intervention by the trainer

Step	Number (%)
1. Creation of pneumoperitoneum	2 (11)
2. Insertion of ports and laparoscopic survey	4 (22)
3. Dissection at Calot's triangle including application of clips	8 (45)
4. Dissection and delivery of the gallbladder	4 (22)
<b>Total</b>	<b>18 (100)</b>

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