

616.366-089-78

## Laparoscopic Cholecystectomy : Modifications of the Technique

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### Abstract

Laparoscopic cholecystectomy has been rapidly replacing the traditional method of open cholecystectomy. With experience of the technique surgeons are adding and developing technical «tips» and modifying the procedure for better safety and convenience of the patients. This work presents the patients in whom we made minor modifications of the technique in special situations. We use 3 parts only for easy cholecystectomy in 20 patients. The second modification is aspiration and retraction of the gall bladder while keeping the Veress needle inside the gall bladder during dissection for acute cholecystitis in 10 patients. Modification of umbilical port closure by the use of Vicryl stay sutures in 10 patients or the use of prolene plug in 10 patients. Laparoscopic cholecystectomy with modifications of the technique was attempted in 54 patients with symptomatic gall bladder disease during the period from January 1992 to January 1994. There were 40 females and 14 males. The mean age was 43 years (24-62 years). There was no mortality. The mean operative time was 105 minutes (60-150 minutes). In 4 patients laparoscopic cholecystectomy was converted to open cholecystectomy. The average hospital stay was 3.6 days (2-8 days) and the mean time taken for return to normal activity was 12 days (7-35 days).

### Introduction

**THE** laparoscopic cholecystectomy was born in secret in March 1987. Its first investigators developed the techniques throughout 1988 in an atmosphere of skepticism and even hostility. The excellent quality of their results, however, ensured that the technique triumphed in 1989 both in Europe and in the United States, and then rapidly throughout the rest of the world[1].

Laparoscopic cholecystectomy is a rapidly developing technique that is going to be the gold standard for the treatment of gall stones.

This work presents the patients in whom we made minor modifications of the technique in special situations.

With experience of the technique surgeons are adding and developing technical «tips» and modifying the procedure for

better safety and convenience of the patients.

### Material and Methods

The material of the present work comprises the patients in whom we did some modifications of the conventional technique of laparoscopic cholecystectomy. On the whole no selection of patients was attempted.

The modifications of the technique are presented here :

1. *Three ports laparoscopic cholecystectomy (Fig. 1) :*

The umbilical port, the epigastric port and the port of the anterior axillary line just below the costal margin.



Fig. 1. Three ports laparoscopic cholecystectomy, the lateral port is very near to the costal margin.

The decision to do without the fourth port is taken after inserting the three ports as above.

We started to perform this technique after our first 20 laparoscopic cholecystectomy and in those patients the structures are clear and when an easy cholecystectomy is expected.

The presence of omental adhesions did not represent a contraindication to the 3 ports laparoscopic cholecystectomy. This technique is done in 20 patients.

2. *The Second Modification we did it in 10 patients :*

In those patients the Veress needle is inserted into the fundus of the gall bladder which is stabilized by a grasper. As the needle pierces the gall bladder it serves two purposes :

- a) Aspiration of the bile to release tension and help grasping of the gall bladder.
- b) The needle while it is inside the gall bladder is used as a retractor of the liver by pushing the liver upwards and anteriorly, while dissection proceeds from the Hartman's pouch retrogradely into the fundus the needle is gradually withdrawn by the assistant. This technique is extremely helpful in distended, tense gall bladder specially in acute inflammation.

3. *In closing the umbilical port two modifications were used :*

- a) Via an umbilical skin incision the linea alba is exposed. Akocher's clamp is applied to the sheath adjacent to the umbilicus. Two stay

sutures of 0 Vicryl are applied above and below the Kocher's clamp. The Veress needle and the trocar are introduced between the stay sutures. At the end of the procedure the stay sutures are simply tied together to provide an effective, simple and secure closure (Fig. 2). This stay sutures technique is done in 10 patients.

- b) In case of closure of the umbilical port is considered not strong enough, part of a Prolene mesh  $3 \times 2$  cm is folded as a plug and used to strengthen closure of the umbilical port (Fig. 3). The fixation proceeds as follow : one entry of Vicryl 0 suture into the linea alba, then two entries into the folded mesh then a third entry into the linea alba again, the 2 free ends of the Vicryl thread are then tied upon the prolene plug to fix it on the linea alba. This technique was done in 10 patients.

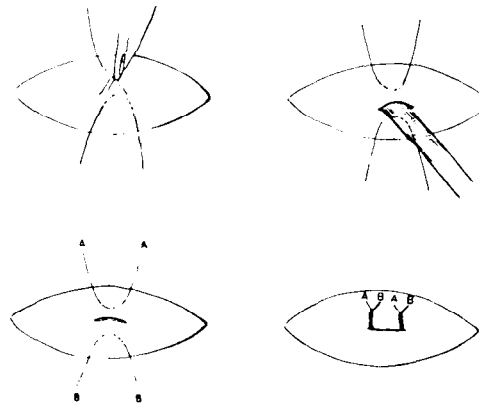


Fig. 2. Modified technique for closing the umbilical port.

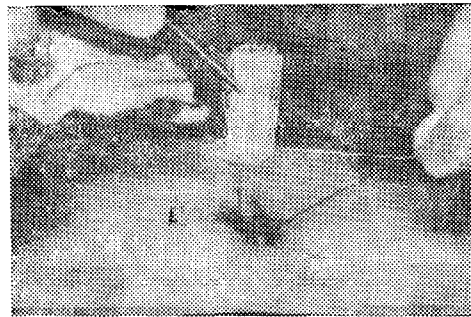


Fig. 3. Prolene mesh for closure of the umbilical port. The mesh will be folded as a plug and sutured in place using Vicryl sutures.

### Results

Laparoscopic cholecystectomy with modifications of the technique was attempted in 54 patients with symptomatic gall bladder disease during the period from January 1992 to January 1994.

The age of the patients in this study ranged between 24-62 years with the mean age of 43 years.

There were 40 female patients in this study, while the male number was 14 patients.

There was no mortality and no intra-operative complications.

The mean operative time was one hundred and five minutes ranging from 60 minutes to 150 minutes.

In four patients 3 females and one male laparoscopic cholecystectomy was converted to open cholecystectomy.

Thirty three patients complained of pain at the trocar sites, mainly the epigastric site for 24-48 hours after surgery. In 12 patients the pain persisted for three to six days, requiring oral analgesics.

The nasogastric tube was removed the next morning in all patients.

All patients tolerated oral fluids the day after surgery, though 15 cases had nausea for 48 hours.

The Radivac drain was removed after 48 hours except when the drainage was over 50 ml (10 patients), when it was retained for another 24 hours. In one

case the drain discharged bile stained fluid on the second day and was retained for 4 days by which time the discharge stopped. A check sonography showed no collection.

The average duration of hospital stay after laparoscopic cholecystectomy was 3.6 days (2-8 days) (Table 2) and the mean time taken for return to normal activity was 12 days (7-35 days) (Table 3).

Table (1) : The Reasons for Convrting to Open Cholecystectomy.

Reasons	No. cases
Dense adhesions between gall bladder and duodenum	1
Cirrhosis with rigid enlarged liver	1
Empyema of the gall bladder	1
Unclear duct anatomy	1
<b>Total</b>	<b>4</b>

Table (2) : Duration of Hospital Stay after Laparoscopic Cholecystectomy.

Days	No. of cases	%
1	—	—
2	12	22.2
3	13	24.2
4	8	14.8
5	10	18.5
6	4	7.4
7	3	5.5
8	3	5.5
<b>Total</b>	<b>54</b>	<b>100</b>

Table (3) : Days Required for Return to Normal Activity.

Days	No. of cases	%
0 - 5	—	—
6 - 10	20	37
11 - 15	18	33.3
16 - 20	8	14.8
21 - 25	2	3.7
26 - 30	3	5.5
31 - 35	3	5.5
Total	54	100

### Discussion

Laparoscopic cholecystectomy has been rapidly replacing the traditional method of open cholecystectomy. The percentage of cholecystectomies that are laparoscopic procedures has climbed from 0% in 1987 to 80% in 1992. Seldom has a new surgical procedure gained acceptance quickly [2].

Laparoscopic cholecystectomy is a safe and effective procedure, also it decreases the length of hospital stay from 4-7 days (for open cholecystectomy) to 2-4 days for the laparoscopic procedure and consequently, hospital costs are significantly less[3].

Prospective comparisons between laparoscopic and open cholecystectomy have proved the well-known advantages of the former procedures. However we do believe in such a new technique the field is still open for modifications required for special situations.

With the gradual gain in experience we found that in many situations only 3 surgiports for easy cholecystectomy (as seen during initial inspection of the field) are required.

We started to postpone inserting the fourth port till the progress of the operation dictates it. In order to use the right lateral port more efficiently we do recommend that it should be inserted as near as possible to the costal margin in the anterior axillary line (Fig. 1). In this position the grasping instrument not only grasps and retracts the gall bladder but it simultaneously retracts the liver affording more space for the dissecting instrument.

In the work of Massoud[4] in 1993 who uses only one surgiport for dissection, the umbilical port for vision and prolene suture inserted percutaneously retracting the fundus and the neck of the gall bladder, we found the technique is time consuming and some biliary leak occurs through the prolene sutures from the gall

bladder. For the convenience of the surgeon 3 ports are quite suitable and one assistant can be saved.

A high conversion rate for laparoscopic cholecystectomy in acute cholecystitis is recently reported [5]. In the present study we performed 10 cases converting 2 cases into minilaparotomy cholecystectomy with the technique published previously by us [6].

Among the difficulties experienced in laparoscopic cholecystectomy for acute cholecystitis are the inability to adequately retract or even grasp the inflamed gall bladder [7,8].

In the present work, the Veress needle is used as a retractor for both the gall bladder and the liver from within the gall bladder. Although Cushieri [9] in 1992 uses the Veress needle for aspiration of the tense gall bladder in acute cholecystitis, he withdraws the needle thereafter and does not use it as an endoretractor as in the present work.

In modifying the closure of the umbilical port we were alarmed by the few reports describing small intestinal herniation and/or strangulation as well as the occurrence of umbilical hernia [10,11].

The latter complication occurs in 0.1% to 0.3% of cases [12]. Some controversy as regard the best way to close the umbilical port exists. While some surgeons advise meticulous closure of the fascial defect [10]. Others pertain that closing the fascial defect is difficult with the possibility of inadvertently injuring the underlying bowel [13].

We decided to close the fascial defect especially if multiple punctures by the large 10 mm. or 11 mm. trocar were used, or if we had to extend the fascial defect for extracting the large gall bladder.

The use of Vicryl stay sutures has been reported previously [14], while the use of the prolene plug for closing the fascial defect especially if it has been enlarged, has not been previously reported.

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