



PREOPERATIVE PREDICTORS FOR SUCCESSFUL COMPLETION OF LAPAROSCOPIC CHOLECYSTECTOMY

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Abstract

Background: laparoscopic cholecystectomy is one of the most commonly performed laparoscopic procedure in the world and it is the gold standard for the treatment of various gallstone disease. **Method:** The proposed prospective study was conducted in Smt. N.H.L. Municipal Medical College. A total 100 patients of symptomatic gall stone disease of all age groups both males and females were included in this study. **Results:** Male sex, Positive Murphy's sign, acute cholecystitis, leukocytosis, Pericholecystic fluid collection and edematous GB wall in ultrasonography is associated with significantly higher risk of conversion of laparoscopic cholecystectomy. **Conclusions:** Various clinical, hematological and radiological predictions done preoperatively may help the patient as well as the surgeon in being better prepared for the intraoperative risk of conversion to open procedure and postoperative complications.

Keywords: Predictors, Laparoscopic Cholecystectomy, Preoperative Predictors

INTRODUCTION

Laparoscopy is the minimal invasive technique of the new millennium for performing most of abdominal operations. No other operation has been so profoundly affected by the advent of laparoscopy as cholecystectomy and so rightly laparoscopic cholecystectomy (LC) is one of the most commonly performed laparoscopic procedure in the world and it is the gold standard for the treatment of various gallstone disease [1].

Approximately 2-15% of the attempted LC has to be converted to an open procedure due to various difficulties faced while performing the procedure [2]. Various clinical, hematological and radiological parameters that may help to predict the difficulty level pre-operatively were analyzed in the present study. These predictions done preoperatively may help the patient as well as the surgeon in being better prepared for the intraoperative risk of conversion to open procedure and postoperative complications.

MATERIAL AND METHODS

The proposed prospective study was conducted in Smt. N.H.L. Municipal Medical College and associated V. S. General Hospital, Ahmedabad. A total of 100 patients of symptomatic gall stone disease of all age groups both males and females operated in our department were included in this study. Written informed consent was obtained from all patients included in the study. After enrolling the patients, the following work up was done:

- Clinical history and physical examination.
- All patients had following preoperative investigations

Complete hemogram

Liver function tests

Prothrombin time

Ultrasonography of abdomen

Laparoscopic cholecystectomy was performed with standard four port technique. Laparoscopic surgery converted to open as and when required by the operating surgeon.

Operative steps:

- Patient positioned supine position on operative table.
- Preoperative antibiotic injection ceftriaxone (1gm) i.v. given.
- General anesthesia given.
- Painting done with povidone iodine solution and draping done.
- 10 mm trocar inserted in supraumbilical position.
- Pneumoperitoneum created.



- 30-degree telescope inserted through the trocar and peritoneal cavity inspected.
- 10 mm trocar inserted in epigastric region approx. 2 cm below xiphisternum.
- Another two 5 mm trocar inserted in midclavicular line in subcostal region and anterior axillary line between anterior superior iliac spine and subcostal margin and grasper and Maryland inserted through these trocars.
- Gall bladder grasped with grasper at its body region and retracted towards right shoulder and boundaries of calot's triangle delineated.
- Calot's triangle dissection done with Maryland.
- A window created between the cystic duct and cystic artery.
- Cystic duct and cystic artery ligated with Liga clips.
- Cystic duct and cystic artery cut in between the clips, in such a way that one clip remain on specimen side while another two remain on stump side.
- Closed drain was inserted through the subcostal port into sub hepatic space only when deemed necessary by operating surgeon.
- Specimen retrieval done through the port site and port site wash given with povidone iodine.
- Port site closure done with polyglactin no 1 figure of eight stitches.
- Skin closure done with nylon 3-0.
- Sterile dressing done.
- Patient shifted to postoperative ward and injectable antibiotics and analgesics given to all patients.

RESULTS

Male sex is associated with significantly higher risk of conversion of laparoscopic cholecystectomy than female (9.37% in male, 0% in female).

Age, at least up to 65 years does not affect the success of laparoscopic cholecystectomy.

Positive Murphy's sign signify severity of inflammation in acute cholecystitis is associated with higher (20%) conversion rates of laparoscopic cholecystectomy.

Raised total WBC count is a strong predictor of severity of acute inflammation and associated with higher (12.5%) conversion rates.

Pericholecystic fluid collection and edematous GB wall(8mm) in ultrasonography signifies acute inflammation and associated with higher risk (16.67% and 22.22% respectively) of conversion of laparoscopic cholecystectomy.

DISCUSSION

Laparoscopic cholecystectomy is one of the most commonly performed surgeries world over and is undergoing regular amendment with growing technology in order to make it safer, cosmetically acceptable and cost effective. A number of prospective as well as retrospective studies have described certain factors that play a role directly or indirectly in making this procedure difficult. Various clinical, hematological and Ultrasonological parameters that may help predict the difficulty level pre operatively were analyzed in the present study.

Table 1: Age and sex distribution of patients undergoing successful versus converted laparoscopic cholecystectomy.

		Laparoscopic cholecystectomy				Total	p-value
		Successful	%	Converted	%		
Age (years)	<30	23	95.83	1	4.16	24	0.835
	30-60	66	97.05	2	2.94	68	
	>60	8	100	0	00	8	
Sex	Male	29	90.62	3	9.37	32	0.010
	Female	68	100	0	00	68	

Age was not found to be a significant predictive factor for successful laparoscopic cholecystectomy (p-0.835). This is in contrast with the study by Elder et al³¹ which found age>65 years, a significant independent factor associated with conversion. The observed disparity may be due to younger age of patients in the present study. The mean age of patients in the present study was 33 years and there was no patient with age > 65 years.

Male sex significantly predicted the conversion (p-0.010). Eldar et al³¹ and Schafer et al also found male sex to be significant predictor of conversion of laparoscopic cholecystectomy. Simopolous et al³, in a series of 1804 patients found male sex to be one of the factors attributing to conversion to open cholecystectomy. It was observed that male patients



have more intense inflammation and fibrosis associated with difficult dissection at the calot's triangle and dissection of the gallbladder from its bed and at significantly higher risk of conversion to open than female.

Table 2: Various clinical parameters in patients undergoing successful versus converted laparoscopic cholecystectomy.

Clinical parameters		Laparoscopic cholecystectomy				Total	p-value
		Successful	%	Converted	%		
No of attacks of pain	<5	54	96.42	2	3.57	56	.817
	5-10	32	96.96	1	3.03	33	
	>10	11	100	0	00	11	
Murphy's sign	Positive	8	80.00	2	20.0	10	.0008
	Negative	89	98.88	1	1.11	90	

No. of attacks of pain was not found to be a significant predictive factor for successful laparoscopic cholecystectomy (p-0.817).

Positive Murphy's sign significantly predicted the conversion of laparoscopic cholecystectomy (p-0.0008). Patients with positive murphy's sign have more intense inflammation.

Table 3: Various ultrasonography parameters in patients undergoing successful versus converted laparoscopic cholecystectomy.

USG parameters		Laparoscopic cholecystectomy				Total	p-value
		Successful	%	Converted	%		
GB size	Normal	55	98.21	1	1.78	56	.430
	Distended	32	96.96	1	3.03	33	
	Contracted	10	90.90	1	9.09	11	
GB wall thickness (mm)	<4	54	100	0	00	54	<.0014
	4-8	36	97.29	1	2.70	37	
	>8	7	77.78	2	22.22	9	
Site of stone	Freely mobile	73	97.33	2	2.66	75	.735
	Impacted at neck	24	96	1	4	25	
No of stone	Single	43	97.72	1	2.27	44	.705
	Multiple	54	96.42	2	3.57	56	
Pericholecystic collection fluid	Present	10	83.33	2	16.67	12	.0029
	Absent	87	98.86	1	1.14	88	

Presence of pericholecystic collection and gallbladder wall thickness were significantly predicted the conversion to open surgery (0.0029, 0.0014 respectively). Thick GB wall on preoperative USG represents either acute inflammation or intense fibrosis due to previous attacks of cholecystitis.

Ultrasonological assessment of GB with reference to volume of GB, stone impacted at neck and number of stones were not found to be statistically significant factors in failure (0.430,0.735,0.705 respectively). In series by Jaskiran et al²³ an impacted stone did not make the procedure difficult.

Table 4: Various laboratory parameters in patients undergoing successful versus converted laparoscopic cholecystectomy.

Lab parameters		Laparoscopic cholecystectomy				Total	p-value
		Successful	%	Converted	%		
WBC count	Normal	83	98.80	1	1.19	84	.015
	Abnormal	14	87.5	2	12.5	16	
Bilirubin	Normal	62	96.87	2	3.12	64	.922
	Abnormal	35	97.22	1	2.78	36	



Alkaline phosphatase	Normal	54	96.43	2	3.56	56	.871
	Abnormal	43	97.72	1	2.27	44	
SGPT	Normal	62	95.38	3	4.61	65	.196
	Abnormal	35	100	0	00	35	

Serum alkaline phosphatase, bilirubin, SGPT level were not found to be a significant predictive factor for successful laparoscopic cholecystectomy (p-0.871, 0.922, 0.196 respectively).

Raised WBC count significantly predicted the conversion of laparoscopic cholecystectomy (p-0.015). Rattener et al²¹ found degree of leukocytosis to be significantly associated with severity of inflammation and failure of laparoscopic procedure.

CONCLUSIONS

Various clinical, hematological and radiological predictions done preoperatively may help the patient as well as the surgeon in being better prepared for the intraoperative risk of conversion to open procedure and postoperative complications.

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