

Research Article

A comparative study between laparoscopic and open cholecystectomy

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Abstract: Open cholecystectomy was the gold standard for the treatment of the stones in the gall bladder till laparoscopic cholecystectomy was introduced in 1985. It is generally accepted that laparoscopic cholecystectomy has lower morbidity and complication rates, and a faster postoperative recovery as compared to Open cholecystectomy. The objective is to compare the advantages and drawbacks of laparoscopic cholecystectomy as compared to Open cholecystectomy. The methods in this study are Forty consenting patients diagnosed as calculus cholecystitis were randomly allocated to either laparoscopic cholecystectomy or open cholecystectomy. Various per- and post operative variables were studied in both groups. In results the study revealed that laparoscopic cholecystectomy requires longer duration of surgery, but is associated with less blood loss, less severe post-operative pain and shorter hospitalization period as compared to open cholecystectomy. In conclusion the study reveals that laparoscopic cholecystectomy is a cost-effective intervention for surgical management of calculus cholecystitis.

Keywords: Laparoscopic cholecystectomy, open cholecystectomy

INTRODUCTION:

Gallstones are one of the major causes of morbidity all over the world. Until the end of the 1980s, open cholecystectomy (OC) was the gold standard for the treatment of the stones in the gall bladder. This operative procedure was effective with low mortality and complication proportions. Laparoscopic cholecystectomy (LC) was introduced in 1985 and rapidly became the method of choice for surgical removal of the gall bladder. This rising popularity was based on many arguments, including assumed lower morbidity and complication rates, and a quicker postoperative recovery compared to OC [1]. However, laparoscopic cholecystectomy is relatively expensive as it involves high costs of the equipment and the specialized training. In a developing country like India, where the medical costs and loss of working days constitute major issues, could LC establish itself as a safe and cost effective alternative to the OC? This study aims to compare the advantages and drawbacks of LC as compared to OC in a tertiary care hospital in rural India, utilizing various per- and post operative indicators.

The aim of this study is to compare laparoscopic cholecystectomy and open cholecystectomy using per-operative and post-operative factors.

METHODS AND PATIENTS:

Forty consenting patients diagnosed as calculous cholecystitis, planned for cholecystectomy and meeting pre-decided inclusion and exclusion criteria at Kamineni Institute of Medical Sciences, Narketpally from September 2012 to October 2014 were randomly allocated to one of the two groups through a 20-each sealed envelope method. One group was subjected to LC and the other to OC. The patients were interviewed for detailed clinical history, examined and underwent blood investigations including liver function tests and abdominal USG. Data was collected prospectively and included patient's demographics, laboratory results, operative findings, requirement for conversion to open cholecystectomy, operating time (from incision to closure), per-operative bleeding, operative complications, duration of post-operative pain, analgesic administration, and length of hospital stay and with post-operative complications.

RESULTS:

Forty patients of calculous cholecystitis (15 males: 25 females) were randomly distributed to one of the two surgical procedures i.e. laparoscopic cholecystectomy and open cholecystectomy. The age and sex distribution of the patients is presented in Table 1 and 2, respectively.

Per-operative variables i.e. duration of surgery and blood loss were evaluated for each patient and have been tabulated in Table 3. The median duration of operative procedure for significantly longer for LC (median 105 minutes: range 45–160) as compared to OC (median 70 minutes: range 40-135), and the difference was statistically significant ($p < 0.05$). However, blood loss was significantly more for OC as compared to LC ($p < 0.05$).

Comparison of Post-operative factors between LC and OC are depicted in Table 4. It is seen that post-operative pain was not only more severe, but also of longer duration among those who underwent OC, requiring frequent and longer analgesics post-operatively. Similarly patients who underwent OC took longer to recover (late return of bowel sounds) thus necessitating longer period of hospitalization. However, the complication rate was slightly higher with LC as compared with OC. In addition, two patients who were planned for LC had to under OC, giving a conversion rate of 10%.

Table-1: Age distribution of Study Patients

Age in Years	Laparoscopic cholecystectomy n=20 (%)	Open cholecystectomy n=20
< 30	01 (5%)	01 (5%)
31-40	10 (50%)	05 (25%)
41-50	06 (30%)	06 (30%)
51-60	03 (15%)	06 (30%)
61-70	-	02 (10%)

Table-2: Distribution of Study Patients as per Gender

Gender	Laparoscopic cholecystectomy n=20(%)	Open cholecystectomy n=20(%)
Male	5(25%)	10(50%)
Female	15(75%)	10(50%)
Total	20(100%)	20(100%)

Table-3: Comparison of Per-Operative Variables between Two Groups

Per-Operative Variable	Grouping	laparoscopic cholecystectomy n=20 (%)	Open cholecystectomy n=20 (%)	P value
Duration of Surgery (min)	30 – 60	2 (10)	9 (45)	< 0.05
	61 – 90	6(30)	7 (35)	
	91 - 120	9 (45)	2 (10)	
	> 121	3 (15)	2 (10)	
Blood loss during surgery (ml)	< 100	18(90)	5(25)	< 0.05
	> 100	2(10)	15(75)	

Table-4: Comparison of Post-Operative Variables between Two Groups

Per-Operative Variable	Grouping	Laparoscopic cholecystectomy n=20 (%)	Open cholecystectomy n=20 (%)
Pain Score (VAS)	Grade 1	7(35%)	1(5%)
	Grade 2	9(45%)	11(55%)
	Grade 3	4(20%)	7(35%)
	Grade 4	-	1(5%)
Duration of pain(days)	< 4	17(85%)	6(30%)
	> 4	3(15%)	13(65%)
Duration of hospital stay (days)	1-3	9(45%)	-
	4-6	8(40%)	9(45%)
	> 7	3(15%)	11(55%)
Time taken to return of bowel sounds (hrs)	< 6	02(10%)	-
	6 - 12	18(90%)	02(10%)
	12 - 24	-	16(80%)
	24 - 36	-	02(10%)
Time to resumption of Oral feeds	< 6	02(10%)	-
	6 - 12	10(50%)	02(10%)
	12 - 24	08(40%)	14(70%)
	24 - 36	-	04(20%)
Complications	Bile leak	-	2(10%)
	Stone spillage	3(15%)	1(5%)
	CBD injury	2(10%)	-
	Adjacent organ injury	1(5%)	1(5%)
	Conversion	2(10%)	-
	Wound Infection	2 (10%)	5 (25%)

DISCUSSION:

The present study compared per- and immediate post-operative variables between LC and OC. The study revealed that operative time for LC was significantly higher than OC ($P < 0.05$). This observation of the present study collaborates with the study by Solanki *et al.*; [2] that reported a significantly longer operative period for LC as compared to OC. The blood loss during surgery is less in LC group (<100 ml in 18 patients and >100ml in 2 patients) compared to OC group (<100 ml in 5 patients and >100 ml in 15 patients), and the difference was found to be statistically significant ($P < 0.05$). This comparable favorably with studies by Solanki *et al.*; Pain during post-operative period is important for PO management. The study revealed that severity as well as duration of pain during post-operative period was significantly less among LC patients as compared to OC group. Similar results were reported by Saeed *et al.*; [3]. The present study revealed that LC causes less surgical trauma to superficial and deep abdominal tissues and organs as observed by early return of bowel sounds, faster resumption of oral feeding and overall shorter hospital stay. These findings of the study reinforce similar results by Saeed *et al.*; [3] Soni *et al.*; [4] and Attwood *et al.*; [5]. In this study there were no major complications and several minor ones. There was no peri-operative mortality. The complications observed were–Bile Leak (LC 0%, OC 10%), wound Infection (LC 10%, OC 25%), Stones Spillage (LC 15%, OC 05%) and CBD Injury LC10%, OC 0%) similar results were reported by Siddiqui *et al.*; [6] and Gupta *et al.*; [7]. The conversion was necessary in 2 patients out of 20 patient undergoing LC. One patient required conversion due to difficult dissection in view of acute cholecystitis and the other due to slippage of clip applied to cystic artery.

CONCLUSION:

The study conducted among 40 patients of gall stones, randomly allocated to two surgical procedures i.e. laparoscopic and open cholecystectomy supports that laparoscopic cholecystectomy results in lesser blood loss and surgical trauma during surgery, resulting in decrease intensity and duration of pain, early bowel recovery and overall shorter period of hospitalization. Although laparoscopic cholecystectomy is more resource intensive, the benefits outweigh the cost.

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