



APPLICATION OF CRITICAL PATH TO HOSPITAL DISCHARGE TIMING AFTER LAPAROSCOPIC CHOLECYSTECTOMY: A COMPARATIVE STUDY OF DAY 1 VS. DAY 2 POSTOPERATIVE DISCHARGE PROTOCOL.

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KEYWORDS :

Introduction:

Laparoscopic cholecystectomy is the most effective treatment for patients with symptomatic gallbladder diseases.¹⁻³ Laparoscopic cholecystectomy has been widely used because it is associated with shorter hospital stay, shorter recovery period, lower hospital cost, and postoperative pain reduction. Open cholecystectomy has been limited to acute cholecystitis with complications.⁴

In recent years, laparoscopic cholecystectomy has been performed under a systematic treatment algorithm using the critical pathway (CP), which is a series of standardized processes for the diagnosis and treatment of a defined condition based on practice guidelines in order to reduce the duration, improve outcomes and reduce costs.⁵⁻⁷ It has been proved in other studies that it is possible to effectively reduce the hospital stay and the cost of hospitalization when CP is applied. Furthermore, some studies revealed that there was no significant difference in the re-admission rate, visual analogue scale (VAS) pain score, and postoperative complication rate comparing day-surgery and overnight stay surgery in laparoscopic cholecystectomy. However, it was difficult to find studies that directly compare two CPs with different hospital stay period. Also, the effectiveness of these pathways in achieving their goals is not well studied. Hence in this study, we tried to assess whether there is significant difference between 1-day CP (discharge from hospital on postoperative day 1) and 2-day CP (discharge from hospital on postoperative day 2).

Materials and Methods:

This prospective study conducted at the department of General Surgery of Dr Panjabrao Alias Bhausaheb Deshmukh Memorial Medical College and Research Centre, Amravati, protocol of which was approved by the Institutional Ethical committee of the medical college. Written informed consent was taken from all study subjects.

Two types of clinical pathway of laparoscopic cholecystectomy were developed and applied to patients by surgeon's decision: 1-day CP and 2-day CP. Inclusion and exclusion criteria for CP was summarized below. One- and 2-day CPs had the same preoperative lists. All patients' records admitted via outpatient clinic and received elective laparoscopic cholecystectomy were evaluated for comorbidities, history of previous abdominal surgery, IV and PO medications, operative time and other surgical details, post-operative complications. Patients visited outpatient department 1 week after the discharge day were evaluated and complete blood cell count and liver function follow up tests results obtained. After 1 month from the first follow up visit, a second outpatient follow up visit was done, the record of which was also obtained. Final postoperative complications data was analyzed including medical records of outpatient clinic. Visual analogue Numerical Rating Scale (NRS) pain scores were checked post-operatively.

Inclusion criteria were:

1. Patients with Gallbladder stone, gallbladder polyp,
2. Admitted via out-patient department,
3. Agreed with critical pathway.

Exclusion criteria were:

1. Patients with cholecystitis with complications (empyema, perforation),
2. Accompanied CBD stone,
3. Emergency operation,

4. Open conversion, Operative complication; biliary tract injury,
5. Refused to be discharged as scheduled Disagreed with critical pathway.

Sampling method was convenience sampling and all eligible patients coming during study period were included in the study.

Statistical analysis was done by SPSS version 22 (IBM: Armonk, NY, USA). Statistical significance set at $p=0.05$.

Results:

In the current prospective study, there was no lost to follow up and we have analyzed 71 patients at the end; 33 in the one-day critical path (CP) group and 38 in two-day critical path group, so the response rate was 100%. Mean age of the patient in the one-day CP group was 50.3 ± 8.6 years vs 53.4 ± 9.7 years in the two-day CP group. Majority of the patients were male in both the groups. 12 (36.36%) had comorbidity in one-day CP group as opposed to 18 (47.37%) in two-day CP group. 4 (12.12%) patients in one-day CP group had history of abdominal surgery vs 7 (18.42%) in two-day CP group. Most common cause of cholecystectomy in both the group was cholecystitis with gall stones (57.58% vs 50%) followed by cholecystitis with gall stones (33.33% vs 34.21%) and gallbladder polyp (9.09% vs 15.79%). But the two group did not differ significantly as per these baseline characteristics ($p>0.05$). (Table 1)

Table 1. Distribution of patients according to baseline characteristics.

Baseline characteristic		1-day CP (n=33)	2-day CP (n=38)	P
Mean age (years)	Mean + SD	50.3 + 8.6	53.4 + 9.7	0.1
Gender	Male	22 (66.67)	28 (73.68)	0.5
	Female	11 (33.33)	10 (26.32)	
Comorbidities	Yes	12 (36.36)	18 (47.37)	0.3
	No	21 (63.64)	20 (52.63)	
Abdominal surgery	Yes	04 (12.12)	07 (18.42)	0.4
	No	29 (87.88)	31 (81.58)	
Diagnosis	Cholecystitis without stone	11 (33.33)	13 (34.21)	0.9
	Cholecystitis with stone	19 (57.58)	19 (50)	
	Gallbladder polyp	03 (9.09)	06 (15.79)	

Table 2 is showing surgical details & outcomes of the patients. Mean operative time in the one-day CP group was (63.4 + 20.5 minutes) was significantly less than the two-day CP group (74.7 + 18.8 minutes). On follow up visit we have noted septicemia, readmission, urinary tract infection, wound sepsis and wound hematoma more among one-day CP group but this did not reach significance ($p>0.05$). Follow up lab. analysis had shown raised WBC count (21.21% vs 13.16%) and raised liver enzymes (9.09% vs 10.53%) but there was no significant difference between the two. Mean pain score of the patient in the one-day CP group was $2.34 + 0.74$ vs $2.11 + 0.66$ in the two-day CP group & there was no significant difference between the two. Mean no. of

analgesic injections given in the two groups also did not differ significantly. (Table 2)

Table 2. Comparison of surgical details and outcomes among the study subjects.

Parameter		1-day CP (n=33)	2-day CP (n=38)	P
Operation time (min.)	Mean + SD	63.4 + 20.5	74.7 + 18.8	0.01
	Complications			
	Septicemia	2 (6.06)	1 (2.63)	0.4
	Readmission	1 (3.03)	0 (00)	0.2
	UTI	3 (9.09)	2 (5.26)	0.5
	Wound sepsis	2 (6.06)	2 (5.26)	0.8
	Wound hematoma	0 (00)	1 (2.63)	0.7
Follow up lab.	Raised WBC	7 (21.21)	5 (13.16)	0.4
	Raised liver enzymes	3 (9.09)	4 (10.53)	0.8
Pain score	Mean + SD	2.34 + 0.74	2.11 + 0.66	0.1
No. of analgesic injection	Mean + SD	0.17 + 0.67	0.14 + 0.88	0.8

Discussion:

In the current prospective study, on application of critical path to hospital discharge timing after laparoscopic cholecystectomy, we have compared one-day discharge with two-day discharge. Patients in the one-day CP group (50.3 ± 8.6 years) was quite younger vs than in two-day CP group (53.4 ± 9.7 years). Jae Uk Chong et al⁸ noted similar mean age. Majority of the patients were male in both the groups. 36.36% had comorbidity in one-day CP group as opposed to 47.37% in two-day CP group. 12.12% patients in one-day CP group had history of abdominal surgery vs 18.42% in two-day CP group. Most common cause of cholecystectomy in both the group was cholecystitis with gall stones (57.58% vs 50%) followed by cholecystitis without gall stones (33.33% vs 34.21%) and gallbladder polyp (9.09% vs 15.79%). But the two group did not differ significantly as per these baseline characteristics ($p > 0.05$). Consistent to our study, Jae Woo Park et al⁹ observed that preoperative characteristics were not different between two CP groups.

Mean operative time in the one-day CP group (63.4 ± 20.5 minutes) was significantly less than the two-day CP group (74.7 ± 18.8 minutes). CD BRIGGS et al⁵ noted mean operation time was 62 min with 84% cases discharged on same day. On follow up visit we have noted septicemia, readmission, urinary tract infection, wound sepsis and wound hematoma more among one-day CP group but with respect to complications, two groups did not differ significantly ($p > 0.05$). Jae Uk Chong et al⁸ reported that operation time significantly alters the timing of discharge post cholecystectomy. Follow up lab. analysis had shown raised WBC count (21.21% vs 13.16%) and raised liver enzymes (9.09% vs 10.53%) but there was no significant difference between the two. Mean pain score of the patient in both the groups (2.34 ± 0.74 vs 2.11 ± 0.66) did not differ significantly. Mean no. of analgesic injections given also did not differ significantly in the two groups. Similar to our study, CD BRIGGS et al⁵ also did not find significant difference between the two groups with respect to mean pain score, Intravenous opiate therapy and complications. This is also in line with Jae Woo Park et al⁹ who reported that operative outcomes of 2-day CP group showed longer operative time than 1-day CP (73.4 vs 54.1 min, $p < 0.001$); otherwise, there was no significant difference in frequency of postop complications (6.1% vs 2.6%, $p = 0.474$), numerical rating scale (NRS) pain score (1.82 vs 2.16, $p = 0.052$), and count of analgesics injection (0.12 vs 0.16, $p = 0.754$).

Conclusion:

The length of hospital stays in patients who undergo cholecystectomy can be effectively shortened to one day without increasing pain scores and complications, hence we recommend policy of same day discharge to reduce burden on patients and hospital as per our results.

Declaration:

There was no source of funding in our study and there was no any conflict of interest in this study.

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