

Laparoscopic Cholecystectomies Performed at Night Versus Day at LVHN: An Investigation Into Average Length of Stay

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Laparoscopic Cholecystectomies Performed at Night Versus Day at LVHN:

An Investigation Into Average Length of Stay

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Intro/Background

The Tokyo Guidelines 13 are a set of widely accepted evidence based guidelines for classification and grading of hepato-biliary disease, specifically acute cholangitis and acute cholecystitis, as well as intervention based on severity of disease and patient factors. The guidelines suggest early definitive intervention, within the first 24-72 hours, through laparoscopic cholecystectomy to improve outcomes. Several studies have since been published, with differing conclusions, investigating the outcomes of laparoscopic cholecystectomies performed at night, versus those delayed and performed at day, in regards to average length of stay and associated complications.

Problem Statement

The purpose of this study is to evaluate non-elective laparoscopic cholecystectomies performed for acute cholecystitis in the Lehigh Valley Health Network in the past 10 fiscal years at day versus night to examine length of stay. I hypothesize that non-elective nighttime cholecystectomies will lead to a statistically significant decreased length of stay.

Methodology

The Department of Surgery was queried for retrospective patient data for the past 10 fiscal years for patients with an ICD-9 procedure code as laparoscopic cholecystectomy and a diagnosis of acute cholecystitis. Elective cases were removed, and only those listed as urgent or emergent were included. Patients who expired (n=7) were removed from the data, as well as any with a length of stay outside two standard deviations. For this study, nighttime was defined as 1900-0700 and day time as 0700-1900, the same time period used in other similar studies.



Results Gathered

The number of emergent or urgent laparoscopic cholecystectomies for acute cholecystitis performed at day over the 10 year period was n=4213 and at night was n=504. Average length of stay for day for those performed during the day was 3.06 days and at night was 2.47 days. Overall, the 10 year mean was an average length of stay 19.3% shorter when the laparoscopic cholecystectomy was performed at night verses day. A p value of <0.05 was used to determine if the difference was statistically significant and through a t-test analysis and found to be extremely statistically significant (<0.001).

Emergency Lap Cholecystectomies

ALOS: DAY vs. NIGHT Procedures
10 Year Analysis

LAP CHOLE (51.23)					
Fiscal Year	DAY		NIGHT		% ALOS Lower at Night
	ALOS	COUNT	ALOS	COUNT	
FY05	3.20	307	2.79	39	13.0%
FY06	3.38	299	2.60	43	23.2%
FY07	3.37	381	2.33	58	30.9%
FY08	3.23	397	2.73	62	15.5%
FY09	3.19	391	2.38	60	25.4%
FY10	3.02	429	2.41	44	20.2%
FY11	3.21	423	3.27	31	-2.0%
FY12	2.86	430	2.04	34	28.6%
FY13	2.76	436	2.29	23	17.1%
FY14	2.67	380	2.15	51	19.5%
FY15	2.92	340	2.36	59	19.0%
AVG/TOTAL	3.06	4213	2.47	504	19.3%

NOTES: DAY = OR IN 7AM TO 7PM, NIGHT = OR IN 7PM TO 7AM
All cases where pt expired were removed before summary was done
All cases are Emergent/Urgent (as opposed to Elective)
2 STDEV LOS outliers were removed before summary was done

Conclusion

In this retrospective investigation into Lehigh Valley Health Network's laparoscopic cholecystectomies for acute cholecystitis performed at day versus those performed during night, it can be definitively concluded there is a statistical significance in a reduced average length of stay for those performed at night (1900-0700). This supports the conclusions from the Tokyo Guidelines 13 for definitive intervention for acute cholecystitis within the first 24-48 hours, especially for those with comorbidities. Our hospital system should continue this model, as it produces better patient outcomes and also takes advantage of unused infrastructure and resources at night. This study could be improved by further investigating and stratifying subgroups including severity of patient disease as defined by the Tokyo 13 Guidelines, age, sex, type of complications (specifically conversion to open), and pathological correlation of disease. It would also be interesting to investigate the costs of performing laparoscopic cholecystectomies at night versus day.

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