

# Benefits of Early Cholecystectomy in Patients Presenting With Acute Gallstone Cholangitis following ERCP: A Systematic Review and Meta-Analysis

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#### INTRODUCTION

- Cholecystectomy following an episode of acute gallstone cholangitis (AGC) is strongly supported by the data, however the timing of cholecystectomy remains uncertain.
- Delay in cholecystectomy following an episode of AGC may increase the risk ED visits and readmissions while awaiting elective cholecystectomy.

#### AIMS

- Asses the safety of early cholecystectomy in acute gallstone cholangitis.
- Compare the outcomes of early vs late cholecystectomy in patients with acute cholangitis.

#### **METHODS**

- A systematic review and meta-analysis of six studies comprising a total of 604 patients (289 and 315 patients were allocated to the early and late cholecystectomy groups, respectively)
- The inclusion criteria comprised all randomized controlled trials (RCTs) and nonrandomized comparative trials (NCTs) that evaluated early (<24 hours) versus late (>24 hours) cholecystectomy among patients with acute gallstone cholangitis.
- The efficacy outcomes were summarized as mean difference (MD) or risk ratio (RR) with 95% confidence interval (CI).

## RESULTS

The mean length of hospital stay (MD=-1.25 d, 95% CI [-1.94, -0.55], p<0.001) was significantly reduced.

The rate of readmission within 30 days (RR=0.07, 95% CI [0.02, 0.28], p<0.001) was significantly reduced

The rate of readmission due to a biliary cause (RR=0.06, 95% CI [0.02, 0.18], p<0.001) was significantly reduced

The rate of death within 30 days (RR=0.16, 95% CI [0.03, 0.83], p=0.03)was significantly reduced

Ctudy or Cubarous	Early			Late	Total 184	Mean Difference		Mean Difference	
Study or Subgroup			l Mean	11.05		eight IV, Random, 95°		IV, Random, 95% CI	
Hoilat 2021	5.54 2.9			11.95		5.5% -2.36 [-5.32, 0	-		
Balman 2005 Bayid 2019	1.06 0. 5.2 3.			2.36 4.8		6.4%      -1.25 [-2.05, -0 8.1%       -0.90 [-2.53, 0	-		
Daylu 2018	5.2 3.	3 30	0.1	4.0	60 1	8.1% -0.90 [-2.53, 0	). r 3 <sub>]</sub>		
Total (95% CI)		109	9		163 10	0.0% -1.25 [-1.94, -0	.55]		
Heterogeneity: Tau² =		-	•	0.70); I²	= 0%		_	-4 -2 0 2	4
Test for overall effect:	•					D: 1 D 4:		Favors [Farly] Favors [Late]	
	Early	•	Late			Risk Ratio		Risk Ratio	
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Fixed, 95% CI		M-H, Fixed, 95% CI	
Hoilat 2021	1	46	29	68	66.5%	0.05 [0.01, 0.36]	←		
3ayid 2019	1	35	16	60	33.5%	0.11 [0.01, 0.77]		<del></del>	
Total (95% CI)		81		128	100.0%	0.07 [0.02, 0.28]			
Γotal events	2		45						
Heterogeneity: Chi²:	= 0.28, df=	1 (P = 1)	0.60); <b>I</b> ² =	: 0%			<del></del>		
Γest for overall effec	•	•					0.01	0.1 1 10	11
	Earl		Late			Risk Ratio		Favors [Early] Favors [Late] Risk Ratio	
Study or Subgroup			Events		Weight			M-H, Fixed, 95% CI	
Hoilat 2021	2	46	47	68	58.8%	0.06 [0.02, 0.25]			
Reinders 2010	1	47	18	47	27.9%		←		
	Ö	35	11	60	13.2%	0.00 [0.01, 0.40]			
Sayid 2019	U	33	11	00	13.270	0.07 [0.00, 1.21]	•		
Total (95% CI)		128		175	100.0%	0.06 [0.02, 0.18]	-		
Total events	3		76						
Heterogeneity: $Chi^2 = 0.03$ , $df = 2 (P = 0.99)$ ; $I^2 = 0\%$							0.04	0.1 1 10	1
Heterogeneity: Chi²	= v.v3, at =	: Z (P =	0.00/, 1 -					11 1 1 1 111	
Heterogeneity: Chi² Test for overall effec	•	-					0.01	Favors [Early] Favors [Late]	'
	•	(P < 0.0				Risk Ratio	0.01		'
	t: Z = 5.22 ( <b>Earl</b> )	(P < 0.0 <b>y</b>	0001) Late	e	Weight	Risk Ratio M-H, Fixed, 95% CI		Favors [Early] Favors [Late]	•
Test for overall effec	t: Z = 5.22 ( <b>Earl</b> )	(P < 0.0 <b>y</b>	0001) Late	e	<b>Weight</b> 77.4%	M-H, Fixed, 95% CI		Favors [Early] Favors [Late]  Risk Ratio	
Test for overall effect Study or Subgroup	t: Z = 5.22 ( <b>Earl</b> )	(P < 0.0 y Total	Late	e Total		M-H, Fixed, 95% CI 0.13 [0.02, 1.01]		Favors [Early] Favors [Late]  Risk Ratio	
Test for overall effect  Study or Subgroup  Hoilat 2021 Sayid 2019	t: Z = 5.22 ( <b>Early Events</b> 1	y Total 46	Late Events	<b>Total</b> 68 60	77.4%	M-H, Fixed, 95% CI 0.13 [0.02, 1.01] 0.24 [0.01, 4.55]		Favors [Early] Favors [Late]  Risk Ratio	<b>'</b>
Test for overall effective Study or Subgroup Hoilat 2021 Sayid 2019 Total (95% CI)	t: Z = 5.22 ( <b>Early Events</b> 1	y Total 46 35	11 3	<b>Total</b> 68 60	77.4% 22.6%	M-H, Fixed, 95% CI 0.13 [0.02, 1.01]		Favors [Early] Favors [Late]  Risk Ratio	
Test for overall effect  Study or Subgroup  Hoilat 2021 Sayid 2019	t: Z = 5.22 ( Early Events 1 0	y Total 46 35	11 14	Total 68 60 <b>128</b>	77.4% 22.6%	M-H, Fixed, 95% CI 0.13 [0.02, 1.01] 0.24 [0.01, 4.55]		Favors [Early] Favors [Late]  Risk Ratio	

### CONCLUSION

- Performing laparoscopic cholecystectomy during the same admission for acute gallstone cholangitis significantly decreases 30-day readmission and 30-day mortality in patient with acute gallstone cholangitis.
- Additionally, there was no increase in intra-operative time or the incidence of post-operative complications.