

Targeted Enhanced Recovery in major hepatobiliary surgery: Analysis of PQIP data at a high-volume centre

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Introduction

Postoperative length of stay (pLOS) after major hepatobiliary (HPB) surgery was higher at the Royal Free than the national 'average' in a recent PQIP report ¹

Prolonged pLOS may be a marker of both process and outcome and is associated with both direct and indirect resource implications for patients, healthcare providers and wider society

We sought to identify determinants of pLOS across the perioperative period in order to deliver targeted Enhanced Recovery and individualised preoperative counselling, and augmented perioperative care bundles to 'at-risk' individuals

Methods

Dataset & inclusions: Patients undergoing major HPB surgery at the Royal Free Hospital before 1st December 2018, who survived to hospital discharge

Outcome: postoperative length of stay (days)

Variables: casemix (including age, ASA-PS grade and comorbidities), perioperative processes (including anaesthetic technique and details of perioperative management) and postoperative events (location of care and Clavien-Dindo morbidity)

Statistical analyses: Cox regression to identify potentially modifiable factors associated with postoperative length of stay. Outcomes reported as Hazard Ratios and testing of Proportional Hazard assumption

Results

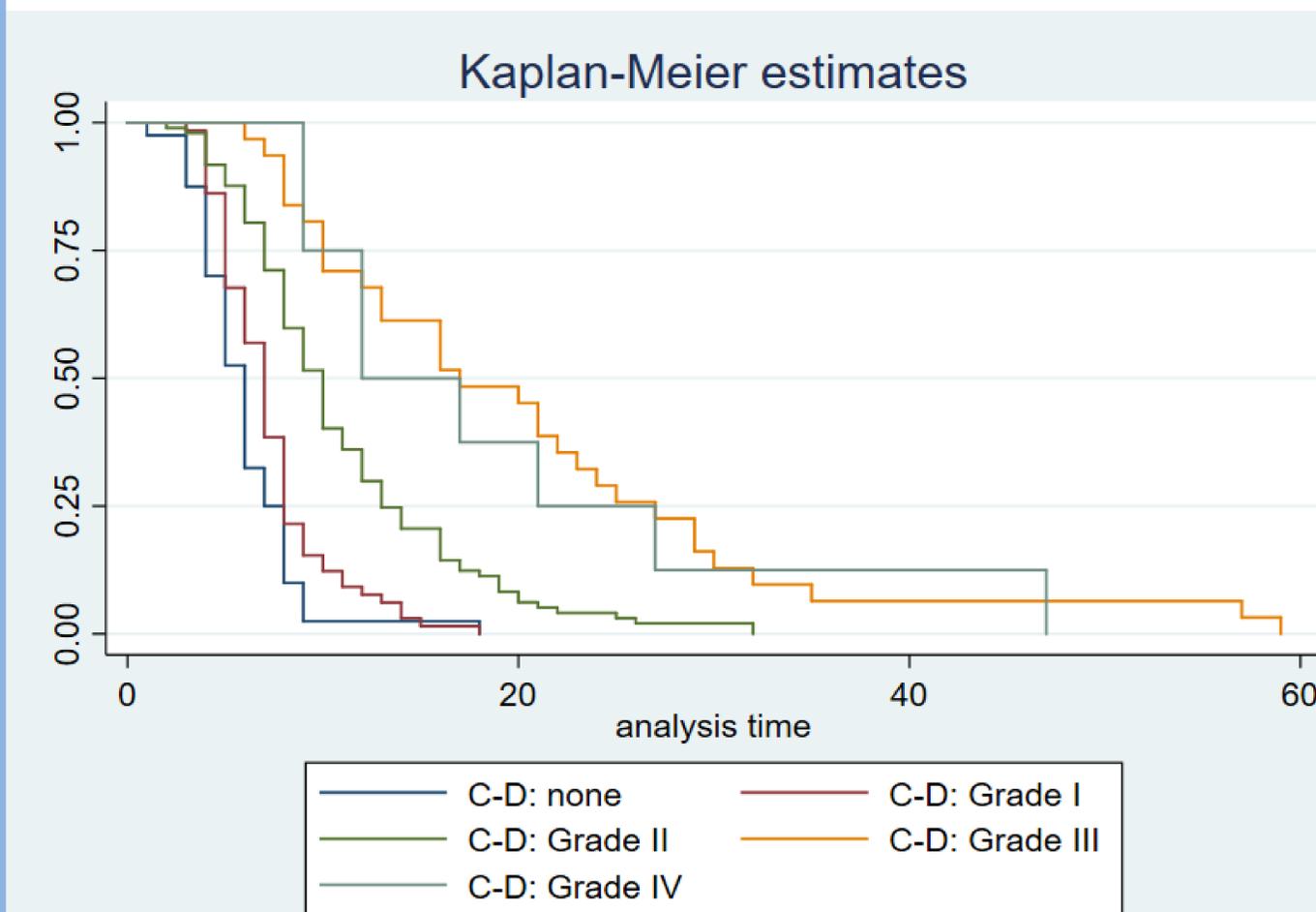
Length of stay data were available for 240 patients surviving to discharge from hospital, 115 (48%) of whom underwent a liver resection and 100 (42%) pancreatic surgery (Table 1)

Median postoperative length of stay was 8 days (5-13) following hepatic resection and 9 days (7-13.5) after pancreatic surgery

No discharge was delayed due to organisational failure or pending social care package

Postoperative morbidity was associated with prolonged pLOS in surgical subgroups (Figure 1 & Table 2)

Figure 1 Kaplan Meier plot of postoperative length of stay by Clavien-Dindo (C-D) morbidity grade for all patients



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Table 1 Cohort characteristics. (*: Median (interquartile range), ASA-PS: American Society of Anesthesiologists -Physical Status classification)

	All patients n= (%)	Liver resections n= (%)	Pancreatic surgery n= (%)
Characteristic			
Male	132 (55)	70 (61)	51 (51)
Age	* 64 (55-71)	* 65 (55-70)	* 65 (57-71)
ASA-PS >2	67 (28)	31 (27)	29 (29)
From own home	240 (100)	115 (100)	100 (100)
Outcome			
pLOS (days)	* 8 (6-13)	* 8 (5-13)	* 9 (7-13.5)

Table 2 Cox regression hazard ratios by type of surgery (PH: proportional hazard, NS: Non-significant, POD: postoperative day)

Variable	Hazard ratio (95% Confidence Interval), p=		
	All patients PH p=0.59	Liver resections PH p=0.99	Pancreatic surgery PH p=0.95
Immediate postoperative destination			
Level 1 care	0.66 (0.37-1.19), 0.17	NS	NS
Level 2 care	1.00 (Ref)	NS	NS
Level 3 care	1.57 (1.04-2.36), 0.03	NS	NS
Urinary catheter beyond POD1	15.79 (1.14-219.6), 0.04	NS	306 (2.88-32679), 0.02
Clavien-Dindo postoperative morbidity			
None	1.00 (Ref)	1.00 (Ref)	1.00 (Ref)
Grade I	1.61 (1.03-2.51), 0.04	1.49 (0.72-3.06), 0.3	2.15 (0.93-4.99), 0.08
Grade II	2.15 (1.35-3.44), 0.001	1.98 (0.99-3.98), 0.06	2.12 (0.87-5.15), 0.10
Grade III	5.56 (2.81-11.01), <0.001	4.64 (1.62-13.32), 0.004	14.2 (3.42-58.8), <0.001
Grade IV	3.25 (1.20-8.80), 0.002	2.10 (0.47-9.41), 0.33	2.43 (0.40-14.8), 0.34

Conclusion

Postoperative morbidity was significantly associated with prolonged pLOS after HPB surgery and increasing severity of morbidity with increased time to discharge. Casemix factors and perioperative processes of care were not significantly associated with pLOS

The apparent decreased HR for pLOS, and non-significance observed in surgical subgroups with Grade IV morbidity probably represents the strong association of organ failure/ multiorgan failure with early mortality

Reliable means to preoperatively identify patients at risk of substantial morbidity would aid efforts to reduce pLOS. We have developed an enhanced recovery protocol for HPB surgery and will incorporate these findings into its rollout

References

¹ Perioperative Quality Improvement Programme Annual Report 2017 – 2018. Royal College of Anaesthetists 2018