Ann Surg Oncol (2022) 29:15–16
https://doi.org/10.1245/s10434-021-10874-6

Annals of
SURGICAL ONCOLOGY
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY

EDITORIAL – HEPATOBILIARY TUMORS

Caveat Emptor: 2-Year Follow-Up Evaluating Post-Resection Liver Decompensation in Patients with Underlying Cirrhosis and Incident Hepatocellular Carcinoma

Dhavan Shah, MD[1], Bona Ko, MD[1], and David J. Bentrem, MD, MS[1,2]

[1]Northwestern University, Chicago, IL; [2]Jesse Brown VA Medical Center, Chicago, IL

Mir et al.[1] present a population-based retrospective cohort study examining post-resection liver decompensation and mortality in patients with hepatocellular carcinoma (HCC) and underlying cirrhosis. The authors have worked with the Institute for Clinical Evaluative Sciences (ICES), a recognized and renowned Canadian data linkage and analysis institute, to answer a focused and relevant question—the burden of post-hepatectomy liver dysfunction in patients with liver dysfunction (cirrhotics) who develop HCC. This is a well-designed study with a robust analysis. This large administrative health dataset from Ontario, Canada, using population-level data and a broad time frame provides an adequate sample for analysis, improving the strength of the conclusions that can be drawn. The 2-year follow-up interval is an important contribution given that only one-third of decompensation events happened in the first 30 days after surgery. Their definition of liver decompensation events differs from the International Study Group of Liver Surgery (ISGLS) consensus definition[2] and relies on diagnosis codes of decompensation events—jaundice, hepatic failure, encephalopathy, and hepatorenal syndrome—which allows for a broader range of clinically significant liver-related complications. The limitations of the analysis are acknowledged, namely perioperative deaths are censored and may represent the most fulminant form of post-hepatectomy failure. In addition, patients who were transplanted after resection were also censored, yet postoperative transplantation may be a salvage strategy for postoperative liver decompensation events (POLDEs) in patients with severe liver failure post-resection who meet the transplant criteria.

The challenge of treating hepatocellular cancer is the need to co-manage two conditions—the underlying liver dysfunction and the malignancy. HCC has one of the fastest growing incidence and death rates in North America and remains the second leading cause of cancer death worldwide. Liver resection is one of the potentially curative options for patients with HCC with other modalities, including percutaneous ablation and liver transplantation, for those meeting the criteria.[3–7] Prior literature has shown underutilization of treatment for early-stage disease.[8] There are many considerations when deciding which therapy to pursue, including the severity of underlying liver dysfunction, location and burden of oncologic disease, and the performance status of the patient. The authors rightly equate POLDEs with appropriate patient selection. This is true for both primary and secondary malignancies of the liver. Post-hepatectomy liver failure is a major cause of postoperative morbidity and mortality after an elective resection. The reported incidence of post-hepatectomy liver failure varies from 1 to 32% across the literature. The variability in incidence can be attributed to the difference in the extent of liver resection, a patient's baseline liver function, their age, comorbidities, and perioperative management. The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) has formed a hepatopancreaticobiliary collaborative, with over 150 US centers participating, and the 30-day rate of post-resection liver failure after elective resection of primary and secondary tumors has been around 10%.[9] Proper perioperative risk assessment is required to predict this

First Received: 14 September 2021
Accepted: 20 September 2021;
Published Online: 15 October 2021

D. J. Bentrem, MD, MS
e-mail: dbentrem@northwestern.edu

complication. Over half of the patients in this series were treated at liver transplant centers and over half of the patients underwent a major liver resection (three or more segments removed). Participating in a quality collaborative and/or monitoring a center's own POLDE rate is an important initial step. This not only provides for enhanced preoperative discussion of surgical risks but also provides an objective measure of performance in terms of appropriateness of patient selection at a given center.

REFERENCES

1. Mir ZM, D, Djerboua M, Nanji S, Flemming JA, Groome PA. ASO Visual Abstract: Predictors of post-operative liver decompensation events following resection in patients with cirrhosis and hepatocellular carcinoma: a population-based study. *Ann Surg Oncol*. 2021. https://doi.org/10.1245/s10434-021-10934-x
2. Rahbari NN, Garden OJ, Padbury R, et al. Posthepatectomy liver failure: a definition and grading by the International Study Group of Liver Surgery (ISGLS). *Surgery*. 2011;149(5):713–24. https://doi.org/10.1016/j.surg.2010.10.001.
3. Curley SA, Izzo F, Ellis LM, Nicolas Vauthey J, Vallone P. Radiofrequency ablation of hepatocellular cancer in 110 patients with cirrhosis. *Ann Surg*. 2000;232(3):381–91.
4. Fong Y, Sun RL, Jarnagin W, Blumgart LH. An analysis of 412 cases of hepatocellular carcinoma at a Western center. *Ann Surg*. 1999;229(6):790–9 (discussion 799-800).
5. Maithel SK, Kneuertz PJ, Kooby DA, et al. Importance of low preoperative platelet count in selecting patients for resection of hepatocellular carcinoma: a multi-institutional analysis. *J Am Coll Surg*. 2011;212(4):638–48. https://doi.org/10.1016/j.jamcollsurg.2011.01.004 (discussion 48–50).
6. Mazzaferro V, Regalia E, Doci R, et al. Liver transplantation for the treatment of small hepatocellular carcinomas in patients with cirrhosis. *N Engl J Med*. 1996;334(11):693–9.
7. Mohanty S, Rajaram R, Bilimoria KY, Salem R, Pawlik TM, Bentrem DJ. Assessment of non-surgical versus surgical therapy for localized hepatocellular carcinoma. *J Surg Oncol*. 2016;113(2):175–80. https://doi.org/10.1002/jso.24113.
8. Cheng E, Hung P, Wang SY. Geographic Variations of Potentially Curative Treatments for Hepatocellular Carcinoma in the United States: A SEER-Medicare Study. *J Natl Compr Canc Netw*. 2020;18(6):729–36. https://doi.org/10.6004/jnccn.2020.7529.
9. Bagante F, Spolverato G, Strasberg SM, et al. Minimally Invasive vs. Open Hepatectomy: a Comparative Analysis of the National Surgical Quality Improvement Program Database. *J Gastrointest Surg*. 2016;20(9):1608–17. https://doi.org/10.1007/s11605-016-3202-3.