



Are Textbook Outcomes after Hepatectomy Only Possible at a Specific Weight?

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The paper “Association of Preoperative Body Mass Index with Surgical Textbook Outcomes Following Hepatectomy for Hepatocellular Carcinoma” describes a multicenter retrospective cohort study evaluating textbook outcome (TO) after potentially curative liver resection for hepatocellular carcinoma (HCC).¹ TO is defined in the manuscript as margin negative resection, no blood transfusion, no postoperative 30-day morbidity or 90-day mortality, no readmission, and length of hospital stay less than 75th percentile for the cohort. Of 1206 patients, TO was achieved in 415 (34%). The major finding is that low ($< 18.4 \text{ kg/m}^2$) and high ($\geq 25.0 \text{ kg/m}^2$) body mass index (BMI) were associated with lower likelihood of TO.

The primary finding is not surprising. Low BMI, likely a surrogate for malnourishment or sarcopenia (loss of skeletal muscle) or both, predisposes patients to worse outcome after hepatectomy.² People with high BMI have more comorbidities like diabetes, hepatic steatosis, and steatohepatitis.³ It follows therefore that obesity (BMI > 30) is associated with worse perioperative outcomes like prolonged operative time, blood transfusion, re-intubation, and pulmonary complications.⁴ These factors also play a role in long-term outcome. Sarcopenia is an independent prognostic factor for mortality and recurrence after hepatectomy for HCC.^{5,6}

Based on this paper’s finding and the literature referenced above, should we attempt intervention for those with low or high BMI prior to hepatectomy for HCC? The most basic answer is no, at least not based on BMI alone. BMI is a simple anthropometric index based on weight and height and does not assess individual components of body weight like fat distribution or muscle volume.⁷ For patients with low BMI and other indications of suboptimal nutrition, interventions make sense and likely pose no additional risk. Choice of intervention, length of time, and target goals are uncertain, yet could be studied in prospective trials.

What about those with high BMI? Regional fat distribution plays a crucial role in metabolic syndrome and is associated with worse perioperative outcomes. As such, are interventions for those with excess visceral fat warranted prior to hepatectomy for HCC? This seems potentially problematic. Again, choice of intervention and length of time to achieve target goals are undefined. Weight loss for high BMI will generally take longer than nutrition supplementation for low BMI, perhaps weeks to months for the former whereas the latter may be achieved in days to weeks. Delaying hepatectomy for resectable HCC to achieve weight loss is likely not a sound recommendation until evidence-based adjuvant therapy options are available to employ prior to hepatectomy.

In the current study, the authors state TO is a composite measure that represents optimal outcomes: a more “real-world” assessment of patient quality. Using TO as a single indicator representing multiple outcomes was first described in 2012 at a colorectal consortium in the Netherlands.⁸ At the time of this editorial, we found 179 articles relating to cancer and TO in an online search. The current study likely presages more to come now that TO is a “hot topic.” Will we learn anything from TO studies? One may argue the TO concept provides a more comprehensive picture of

the postoperative patient experience than any single outcome. Further, when all goals are achieved, TO represents the highest level of surgical quality.

Yet, achieving TO 100% of the time is impossible for most cohorts of surgical patients. Many metrics like length of stay, complications, mortality, and readmissions indirectly or directly affect one another.⁹ In surgical oncology, TO must include cancer-related goals, such as margin-negative resection, lymph node yield, and completion of adjuvant therapy.¹⁰ Achieving a negative resection margin during hepatectomy for HCC in some patients will increase operation complexity and risk of morbidity, blood transfusion, length of stay, and mortality. Even so, the goal of margin-negative resection is preferred over TO if an operation is potentially curative without long-term morbidity. Further, since most postoperative outcomes trend worse in higher risk populations, a goal of 100% TO could lead to overly restrictive patient selection practices.

If criteria for TO are determined without patient engagement, they may fail to include important aspects of patient experience. An interesting study recently found discordance between clinically defined postoperative TO and patients' priorities. As expected, patients prioritize no mortality following surgery, no reoperation, and margin negative resection. Perhaps surprising, patients are less concerned about blood transfusion and avoiding any complication.¹¹ TO in cancer patients must include outcomes they value most highly, including quality of life.¹²

The concept of textbook outcome after hepatectomy or any operation is a work in progress. Setting this as a standard for oncologic surgery may have unintended and negative consequences. Moving forward, we must use a multidisciplinary and patient-inclusive approach to refining textbook outcome definitions.

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CONFLICT OF INTEREST The authors declare that they have no conflict of interest.

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