



Non-anatomic Segment III Resection and Subtotal Gastrectomy for Giant Hepatocellular Carcinoma with Gastric Invasion: A CUSE-Guided Case Report

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ABSTRACT

Hepatocellular carcinoma (HCC) management requires integration of tumor burden, liver functional reserve, performance status, and real-world treatment availability. Contemporary international guidelines recommend multidisciplinary, patient-centered care and, for advanced disease in eligible patients, prioritize systemic therapy. However, in low-resource settings, the guideline-preferred pathway may be structurally or financially inaccessible, forcing clinicians to make difficult decisions under conditions of complexity and uncertainty.

We report the case of a 58-year-old man with ECOG performance status 0, Child-Pugh A cirrhosis, ALBI grade 2, and alpha-fetoprotein of 470 ng/mL who presented with a progressively enlarging epigastric mass and pain-associated weight loss. Imaging demonstrated a giant left-lobe/segment III hepatic tumor with predominantly cysticnecrotic features and mass effect on the stomach, without thoracic metastases. Because the imaging pattern was not entirely classic for non-invasive HCC diagnosis, incisional biopsy was performed and confirmed moderately differentiated HCC. In a fully resourced setting, first-line systemic therapy would have represented the standard strategy for this advanced, non-transplantable scenario. In Guatemala, however, neither liver transplantation nor firstline immunotherapy was realistically feasible. After multidisciplinary review and shared decision-making, the patient underwent non-anatomic resection of segment III, subtotal gastrectomy with reconstruction, excisional biopsy of a hepatic implant, and drainage, with explicit palliative/local-control intent.

The postoperative course was favorable, with no postoperative complications and no posthepatectomy liver failure. Final pathology demonstrated poorly differentiated HCC with necrosis, lymphovascular invasion, direct extension into the gastric muscularis propria, and tumor present at the margin of the resected hepatic implant. Symptom relief and improvement in quality of life were achieved. This case illustrates how the CUSE framework can structure ethically and academically defensible decision-making when evidence, feasibility, and patient priorities diverge. In carefully selected patients, palliative-intent surgery may be justified for local control when standard systemic options are inaccessible, provided that the non-curative nature of treatment is explicitly documented.

KEYWORDS: Hepatocellular carcinoma, CUSE, Palliative-intent surgery, Gastric invasion, Non-anatomic hepatectomy, Low-resource setting.

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ABBREVIATIONS: HCC: Hepatocellular carcinoma; BCLC: Barcelona Clinic Liver Cancer; CUSE: Complexity, Uncertainty, Subjectivity, Emotion; AFP: Alpha-fetoprotein; ALBI: Albumin-bilirubin; ECOG: Eastern Cooperative Oncology Group; ISGLS: International Study Group of Liver Surgery; LVI: Lymphovascular invasion.

INTRODUCTION

Hepatocellular carcinoma (HCC) is the most common primary liver malignancy and usually develops in the setting of chronic liver disease or cirrhosis. Its management is inherently bidimensional: treatment must address oncologic burden while preserving hepatic function and avoiding decompensation. Consequently, modern HCC care requires simultaneous assessment of tumor extent, liver reserve, performance status, and therapeutic feasibility.^{1,2}

Contemporary international guidelines have moved decisively toward multidisciplinary and patient-centered treatment selection. The 2025 EASL Clinical Practice Guidelines emphasize individualized risk-benefit assessment, explicit treatment intent, and adaptation to different healthcare settings.¹ The updated BCLC strategy preserves the direct link between stage and evidence-based first-line therapy, but also recognizes that many real world cases cannot be resolved by algorithm alone.² To address this, the BCLC update embeds the CUSE framework—Complexity, Uncertainty, Subjectivity, and Emotion—as a structured methodology for tumor boards when the evidence does not dictate a single clearly superior option.²

For advanced HCC with preserved liver function and good performance status, systemic therapy is the standard recommendation in high-resource systems. ASCO 2024 recommends atezolizumab plus bevacizumab or durvalumab plus tremelimumab as firstline options for eligible patients with Child-Pugh A liver function and ECOG performance status 0–1; when these regimens are unavailable or contraindicated, sorafenib, lenvatinib, or durvalumab may be offered.³ These recommendations are broadly consistent with the current international direction of EASL and ESMO.^{1,2,6}

The challenge in low-resource settings is not knowing the guidelines, but deciding what is ethically and clinically reasonable when the preferred guideline-concordant treatment is inaccessible. This report presents a patient with giant HCC, gastric invasion, and intrahepatic tumor implants treated surgically in Guatemala. The academic value of the case lies not in claiming curative surgery where cure was improbable, but in documenting a CUSE-guided, humanly grounded, and medically transparent decision for local control and palliation.

CASE PRESENTATION

A 58-year-old man with recently diagnosed diabetes mellitus and prior hemithyroidectomy for benign disease presented with a progressively enlarging epigastric mass over approximately 2 years. Seven months before evaluation, he developed pain over the mass associated with weight loss. He denied jaundice, fever, or overt gastrointestinal bleeding.

On examination, he had ECOG performance status 0, no

jaundice, no palpable peripheral lymphadenopathy, and a poorly mobile epigastric mass measuring approximately 15 cm.

No clinically evident ascites was documented at the initial assessment.

Preoperative laboratory evaluation showed total bilirubin 1.18 mg/dL, direct bilirubin 0.8 mg/dL, albumin 3.1 g/dL, INR 1.39, and platelet count 320,000/ μ L. AFP was 470 ng/mL. Based on available parameters, liver function was classified as Child-Pugh A and ALBI grade 2.⁷

Chest computed tomography showed no evidence of thoracic metastases. Ultrasound demonstrated diffuse micronodular changes compatible with cirrhosis and a large heterogeneous mass arising from the left lobe/segment III, with limited Doppler flow and no biliary dilatation. Triphasic computed tomography revealed a giant lesion originating in the left lobe and extending into the abdomen and pelvis, measuring approximately 150 × 111 × 118 mm, predominantly cystic-necrotic with a peripheral solid component and only modest peripheral enhancement. The lesion displaced the stomach, and cholelithiasis was also present.

Because the imaging appearance was not entirely typical for a purely non-invasive radiologic diagnosis of HCC, tissue confirmation was obtained. This approach was reasonable, particularly in light of the atypical cystic-necrotic morphology and the major therapeutic implications of any definitive intervention.¹ Incisional biopsy demonstrated moderately differentiated hepatocellular carcinoma. Cytology of ascitic fluid was negative for malignant cells.

Therapeutic Decision-Making

From a guideline standpoint, this patient had a non-transplantable, advanced clinical scenario due to locally aggressive disease with gastric invasion and later-confirmed intrahepatic tumor implants. In a high-resource setting, systemic therapy would have represented the standard first therapeutic strategy rather than surgery.^{2,3,6} First-line immunotherapy-based combinations have shown survival benefit in unresectable/advanced HCC, particularly atezolizumab-bevacizumab in IMbrave150 and durvalumab tremelimumab in HIMALAYA.^{4,5}

However, neither liver transplantation nor first-line immunotherapy was realistically feasible in this patient because of structural and socioeconomic limitations in the local context. The decision therefore required movement from a purely algorithmic discussion to a contextual one. The multidisciplinary team explicitly framed the options in terms of treatment intent. Curative treatment was not realistic because of disease extent and the likelihood of residual microscopic or macroscopic disease. The only defensible surgical objective was local control and palliation: reduction of mass effect, relief of pain, prevention of further local complications from gastric invasion, and improvement in quality of life.

After detailed shared decision-making with the patient, including discussion of the noncurative nature of surgery, the expected risk of bleeding, liver failure, gastric leak, need for transfusion, recurrence, and perioperative mortality, as well as the limited availability of systemic alternatives, surgery was chosen with explicit palliative/local-control intent.

Surgical Procedure

The patient underwent non-anatomic segment III liver resection, subtotal gastrectomy, reconstruction with gastrojejunostomy and enteroenterostomy in Braun configuration, excisional biopsy of a hepatic implant, and drain placement.

Intraoperatively, the left liver harbored a massive hypervascular exophytic tumor arising from segment III and occupying much of the upper abdomen. The lesion was firmly adherent to and infiltrated

the gastric body and antrum and was also adherent to the greater omentum. Additional intrahepatic tumor implants were identified, including an approximately 3 cm implant at the edge of segment III and a smaller implant near segment II. Mild splenomegaly and ascites were present. No vascular resection was performed, and the Pringle maneuver was not used. Operative time was approximately 5 hours. Two units of blood were transfused intraoperatively, and further transfusion support was required postoperatively.



Figure 1. Triphasic computed tomography showing a giant tumor arising from hepatic segment III.

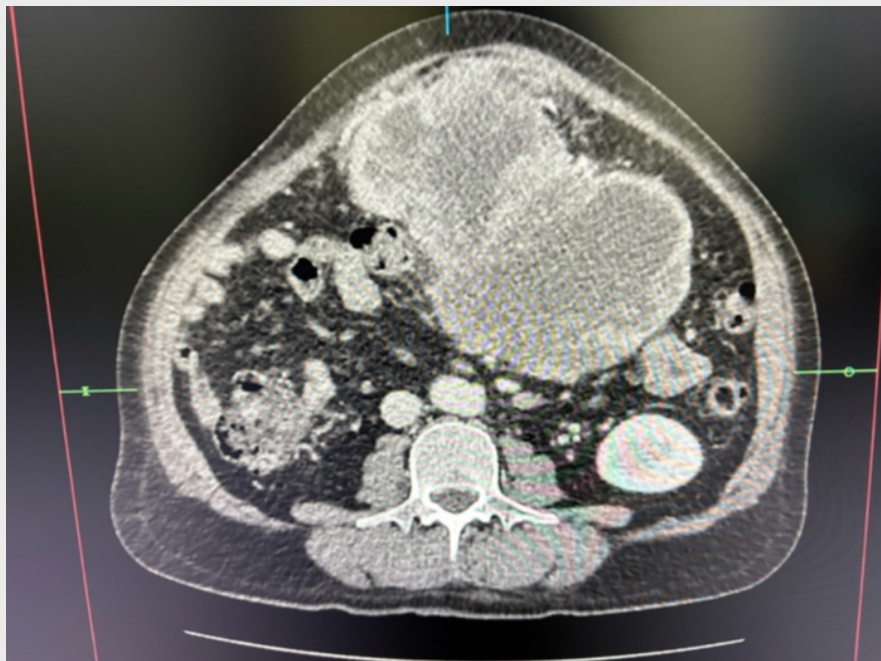


Figure 2. Imaging demonstrating the segment III tumor with suspected fixation to the abdominal wall.



Figure 3. Surgical specimen including the hepatic tumor and resected gastric wall.

Pathology

Final pathology from the hepatic-gastric specimen demonstrated poorly differentiated hepatocellular carcinoma (G3) with extensive necrosis and direct extension into the muscularis propria of the stomach. The tumor measured 20 × 16 × 8 cm and showed lymphovascular permeation. No perineural invasion was reported. No lymph nodes were received in the specimen.

The excisional biopsy of the segment III implant was positive for hepatocellular carcinoma, and tumor was present at the surgical margin of that implant specimen. Margin assessment in the principal hepatectomy specimen was not fully evaluable. Taken together, these findings confirmed that the procedure should be interpreted as non-curative local-control surgery rather than oncologic R0 resection.

Postoperative Course and Current Management

The patient was admitted to the intensive care unit because of operative duration and transfusion requirements, then transferred to the ward after favorable evolution. Oral intake was re-established appropriately, gastrointestinal function recovered, and the abdominal drain yielded scant ascitic fluid. Most importantly, there was clear symptomatic improvement in pain and daily comfort.

No postoperative complications were recorded. Postoperative bilirubin and INR did not worsen beyond baseline. Therefore, the patient did not meet ISGLS criteria for posthepatectomy liver failure, which require worsening bilirubin and INR on or after postoperative day 5.⁹

The patient was subsequently evaluated by medical oncology. Because this was not a curative resection and intrahepatic tumor implantation had been confirmed, any further oncologic treatment should be conceptualized as postoperative systemic management

for advanced/residual disease, not as routine adjuvant therapy after curative surgery. Access limitations remained a major determinant of the final treatment plan, and the patient elected to continue care within the national public hospital network.

DISCUSSION

This case is publishable because it addresses a real and difficult problem in liver oncology: what constitutes a responsible decision when international guidelines favor a treatment that is not actually accessible to the patient. The scientific value of the case lies not in claiming exceptional oncologic success, but in transparently showing how a team can move from guideline knowledge to context-appropriate action without abandoning rigor.

The first important point is that this was not a standard surgical oncology scenario. Gastric invasion and intrahepatic tumor implants placed the patient outside the usual curative frameworks for resection or transplantation. In a fully resourced setting, current guideline logic would favor systemic therapy as first-line management for an advanced presentation with preserved performance status and acceptable liver function.^{2,3,6} Atezolizumab bevacizumab improved overall and progression-free survival compared with sorafenib in IMbrave150, and durvalumab-tremelimumab improved survival versus sorafenib in HIMALAYA.^{4,5} Therefore, surgery must not be presented here as the standard recommendation; it was a deliberate deviation from the preferred pathway because the preferred pathway was not realistically deliverable.

Second, the operation was justified only because its intention was clearly limited and honestly stated. This was not a “salvage cure,” nor a “conversion” strategy, nor a surrogate for transplant. It was palliative-intent local-control surgery in a symptomatic patient with a giant mass, direct gastric invasion, preserved performance status, and liver function that, although imperfect, remained acceptable for a limited parenchymal resection. The choice of a non-anatomic segment III resection rather than a more extensive hepatic operation was rational in this context. Once cure was improbable because of intrahepatic implants and aggressive tumor biology, the surgical priority shifted from maximal radicality to maximal proportionality: enough resection to relieve local disease burden, while preserving as much functional liver parenchyma as possible.

Third, this case demonstrates the practical utility of CUSE.² The framework can be operationalized as follows:

Complexity: The patient had a giant hypervascular HCC, direct gastric invasion, cirrhosis, ALBI grade 2 liver function, ascites detected intraoperatively, possible portal-hypertension-related risk, and limited access to definitive high-cost therapies.

Uncertainty: There was no strong evidence that surgery would improve survival in this exact scenario, and there was meaningful uncertainty regarding perioperative risk in a cirrhotic liver and regarding the magnitude of palliation to be expected.

Subjectivity: The patient strongly favored operative treatment once the limitations of the system and the available options had been explained. The multidisciplinary team also had to weigh its own clinical judgment regarding what was proportionate and feasible within the local infrastructure.

Emotion: The patient had lived with a visibly enlarging tumor for 2 years and with pain for months. Cases like this carry a substantial emotional burden for patients, families, and clinicians alike. CUSE is helpful precisely because it disciplines that emotional pressure instead of denying it.

Fourth, the case has a strong human and medico-legal dimension. In low-resource oncology, good decision-making is not defined by blind imitation of high-resource algorithms; it is defined by transparent process. From a medico-legal and ethical standpoint, the defensibility of this operation rested on six elements: the therapeutic goal was explicitly non-curative; alternatives were discussed, including systemic therapy where feasible and non-operative management; the risks and realistic limitations of surgery were disclosed; the resource constraints were acknowledged rather than hidden; the patient's values and preferences were incorporated; and a postoperative oncology plan was established. In other words, the legitimacy of the decision came from documented shared decision-making under conditions of constrained feasibility, not from the eventual pathology report.

Fifth, the biology of this tumor was clearly aggressive. Final pathology showed poorly differentiated HCC, lymphovascular invasion, gastric muscular invasion, and residual tumor at the margin of the resected implant. These findings predict a very high risk of persistent or recurrent disease and reinforce that surgery alone was insufficient oncologic treatment. They also clarify why the postoperative plan should not be mislabeled as “standard adjuvant therapy.” Adjuvant atezolizumab-bevacizumab has shown recurrence free survival benefit after curative-intent resection or ablation in high-risk patients in IMBrave050, but that evidence applies to a fundamentally different scenario than the present one, in which surgery was not curative and residual disease risk was overt.¹⁰ In this patient, systemic therapy would be better framed as treatment of advanced/residual disease if and when accessible.

Finally, the case also illustrates why biopsy was reasonable. Although many cirrhotic patients with classic imaging can be diagnosed non-invasively, this lesion was predominantly cystic-necrotic with only limited peripheral enhancement, and major irreversible treatment decisions were under consideration. In such a setting, obtaining tissue is academically and clinically sound rather than a deviation from best practice.¹

The principal limitations of this report are the absence of access to guideline-preferred first line immunotherapy, the lack of transplantation feasibility, and the non-curative nature of the surgical procedure. However, these are not reasons to dismiss the case. They are the reasons the case matters. They reflect the exact clinical reality in which many oncologic decisions in Guatemala and similar settings must be made.

CONCLUSIONS

This case illustrates the gap that can exist between guideline-preferred care and feasible care in hepatocellular carcinoma. In a high-resource environment, advanced HCC with gastric invasion and intrahepatic implants would ordinarily be managed with first-line systemic therapy rather than surgery. In Guatemala, that pathway was not realistically available to this patient.

Under those circumstances, a limited palliative-intent operation was selected through explicit multidisciplinary discussion and documented shared decision-making. The value of the case lies in showing that CUSE is not merely a conceptual addition to BCLC, but a practical tool for structuring difficult decisions when complexity, uncertainty, feasibility, and patient priorities collide.

In carefully selected patients, non-curative surgery may be academically valid, ethically appropriate, and clinically useful for local control and symptom relief—provided that its intention, limitations, alternatives, and postoperative oncologic implications are stated with complete honesty.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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