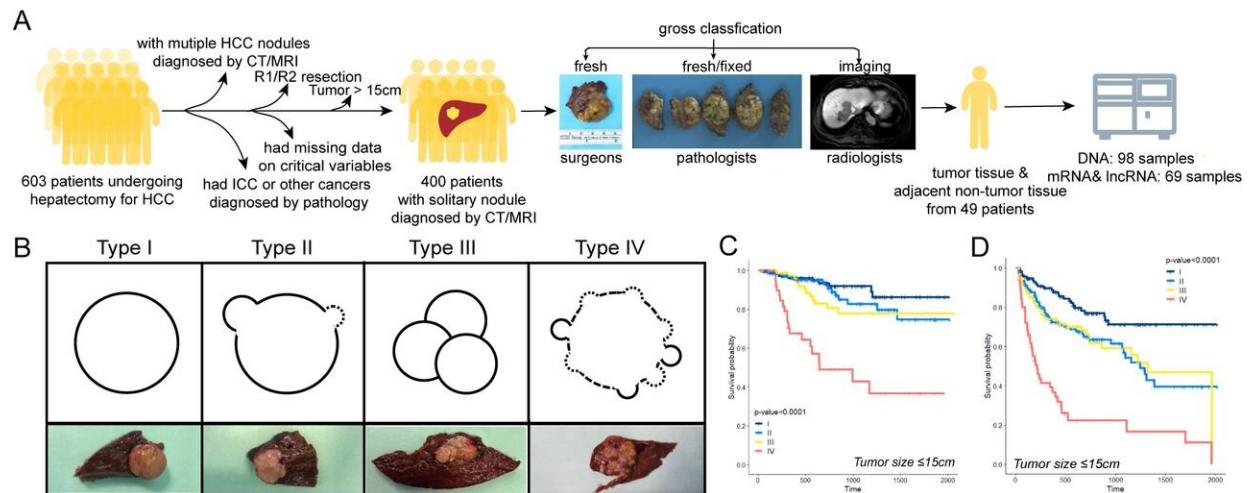


Morphology-based gross classification system for hepatocellular carcinoma stratification

November 28 2023



The prognosis of patients with HCC varies depending on their gross subtype. (A) Flow chart of the study. (B) Different gross types of HCC and their corresponding fresh surgical resected samples. (C) Kaplan-Meier curves for OS based on the gross type in the current cohort (log-rank test). (D) Kaplan-Meier curves for RFS on the basis of the gross type in the current cohort (log-rank test). HCC, hepatocellular carcinoma; ICC, intrahepatic cholangiocarcinoma; OS, overall survival; RFS, recurrence-free survival. Credit: Fan Z, Jin M, Zhang L, et al.

A new study [published](#) in the journal *Gut* has found that different gross subtypes of hepatocellular carcinoma (HCC) have significantly different prognoses and molecular characteristics. The study, led by researchers at

The First Hospital of Jilin University, suggests that gross classification may be valuable for developing individualized diagnosis and treatment strategies for HCC.

HCC is the most common cancer of the hepatobiliary system and a leading cause of cancer-related death worldwide. Despite advancements in therapeutic strategies, recurrence remains a major challenge in HCC management. Local therapies, including surgery, [radiofrequency ablation](#) (RFA), and transcatheter arterial chemoembolization (TACE), are considered standard care for early-stage or intermediate HCC. However, treatment choice remains a dilemma, and non-invasive and simple prognostic indicators for aiding clinical decision-making in HCC are lacking.

The gross classification of HCC, based on tumor shape, has been proposed as a potential prognostic predictor. However, its widespread use has been restricted due to the limited number of studies with sufficient patient numbers and the lack of established mechanisms.

Moriyama's classification system, introduced in 1987, categorizes HCC into five gross subtypes: single nodular type (type I), single nodular type with extranodal growth (type II), contiguous multinodular type (type III), poorly differentiated type (type IV), and early HCC type.

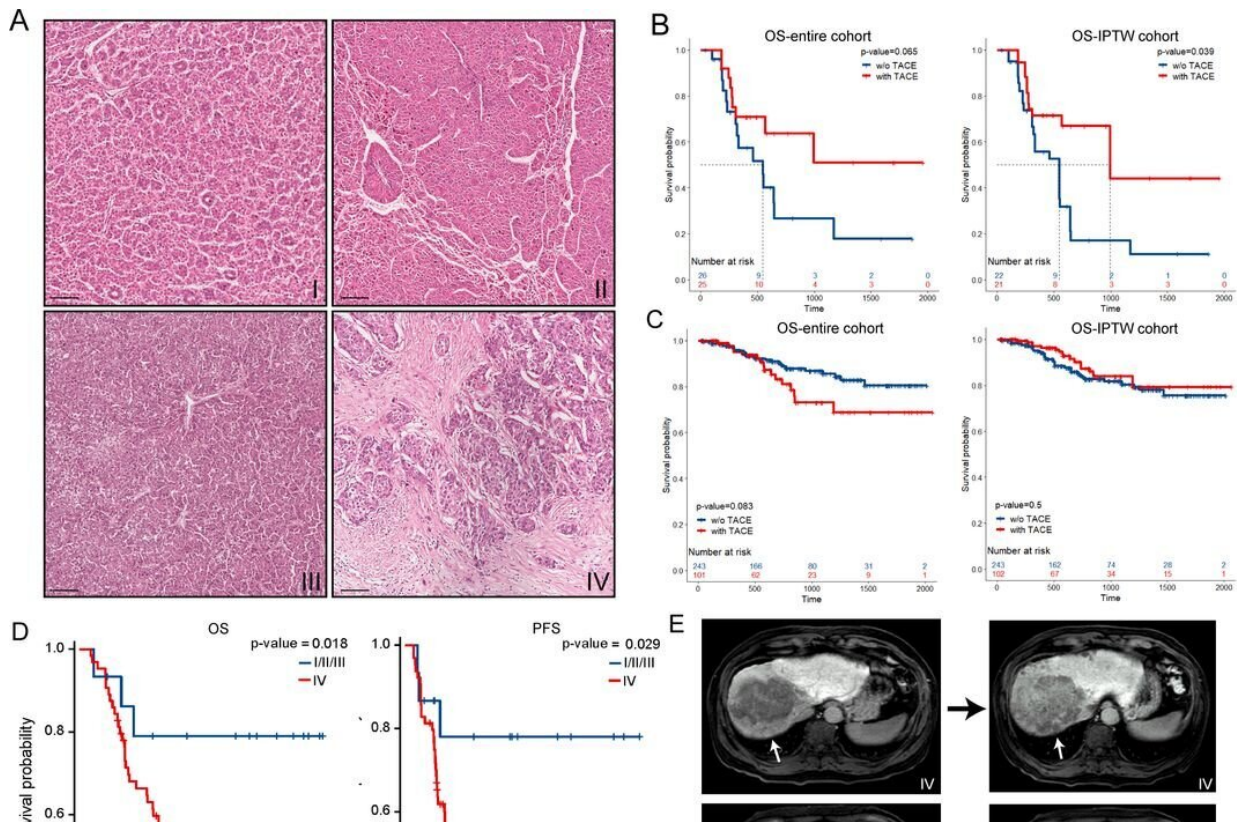
Studies have suggested a correlation between tumor shape and prognosis, and imaging features reflecting HCC gross appearance have been shown to predict outcomes after RFA, TACE, and even lenvatinib treatment.

This new study aimed to comprehensively examine gross subtype-specific prognostic factors and molecular landscapes in HCC. The study investigators reviewed and analyzed a prospective cohort of 400 patients who underwent hepatic resection for solitary HCC. They also performed multiomics analyses on tumors and non-tumor tissues from 49 patients to

investigate the mechanisms underlying gross classification.

"We found that overall three-year survival rates varied significantly among the four gross subtypes (type I: 91%, type II: 80%, type III: 74.6%, type IV: 38.8%)," explained lead study author Zhongqi Fan.

"Type IV was found to be independently associated with poor prognosis. Additionally, we identified distinct transcriptional modules and molecular characteristics for each gross subtype."



Gross classification guiding HCC therapy. (A) H&E staining of HCC tumor samples of all gross types. (B) The Kaplan-Meier curves of OS in patient with type IV HCC treated with or without TACE postoperatively in current overall cohort or IPTW cohort (log-rank test). (C) The Kaplan-Meier curves of OS in patient with type I/II/III HCC treated with or without TACE postoperatively in the overall cohort or IPTW cohort (log-rank test). (D) The Kaplan-Meier curves

of OS and PFS in patient with type I/II/III HCC treated with or without adjuvant drug therapies postoperatively in the overall cohort or IPTW cohort (log-rank test). (E) Gd-EOB-DTPA MRI for the patient with HCCs with type III and type IV before and after immunotherapy combined with antiangiogenesis targeted therapy. White arrows indicated HCC nodules. (F) The clinical implementation process for gross classification of resectable HCC and the corresponding recommended treatment strategies. (G) A novel trichotomous classification system, margin morphology classification (MMC) was proposed based on the conventional gross classification. (H) OS or RFS of patients undergoing hepatic resection for HCCs with different MMC subtype (log-rank test). HCC, hepatocellular carcinoma; IPTW, inverse probability of treatment weight; OS, overall survival; RFS, recurrence-free survival; TACE, transcatheter arterial chemoembolisation. Credit: Fan Z, Jin M, Zhang L, et al.

The study findings have important implications for the clinical management of HCC. "Our results suggest that gross classification may be a valuable tool for developing individualized diagnosis and treatment strategies for HCC," said Zhongqi Fan. "For example, patients with type IV HCC may benefit from adjuvant intra-arterial therapy."

The study investigators also proposed a modified trichotomous margin morphological gross classification (MMC) system based solely on margin morphology. "The MMC system is more user-friendly and may be more practical for clinical implementation," said Zhongqi Fan.

The researchers emphasize the need for further research to validate the MMC system and its clinical utility in larger patient cohorts. They also plan to investigate the molecular mechanisms underlying the differences between gross subtypes to provide further insights into HCC progression and therapeutic targets.

"Our study has taken an important step toward establishing a more

personalized approach to HCC diagnosis and treatment even without any available tissues," said corresponding author Guoyue Lv. "We believe that our findings have the potential to improve patient outcomes and ultimately reduce the burden of HCC."

More information: Zhongqi Fan et al, From clinical variables to multiomics analysis: a margin morphology-based gross classification system for hepatocellular carcinoma stratification, *Gut* (2023). [DOI: 10.1136/gutjnl-2023-330461](https://doi.org/10.1136/gutjnl-2023-330461)

Provided by First Hospital of Jilin University

Citation: Morphology-based gross classification system for hepatocellular carcinoma stratification (2023, November 28) retrieved 17 July 2024 from <https://medicalxpress.com/news/2023-11-morphology-based-gross-classification-hepatocellular-carcinoma.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.