World Journal of Hepatology

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World J Hepatol 2025 December 27; 17(12): 115551

DOI: 10.4254/wjh.v17.i12.115551

ISSN 1948-5182 (online)

LETTER TO THE EDITOR

Ultrasound imaging in orthotopic hepatocellular carcinoma models: Promise, practicality, and points for refinement

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Specialty type: Gastroenterology and hepatology

Provenance and peer review: Invited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's classification

Scientific Quality: Grade B, Grade C

Novelty: Grade C, Grade C

Creativity or Innovation: Grade C, Grade C

Scientific Significance: Grade B, Grade C

P-Reviewer: Wu SZ, MD, Professor, China

Received: October 20, 2025

Revised: October 27, 2025

Accepted: November 24, 2025

Published online: December 27, 2025

Processing time: 67 Days and 23.8 Hours

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Abstract

The study by Devan *et al* presents an ultrasound-based protocol for monitoring tumor growth in a syngeneic orthotopic rat model of hepatocellular carcinoma (HCC). This approach is commendable for its reproducibility, cost-effectiveness, and alignment with ethical imperatives, particularly in reducing the need for invasive assessments. The strong correlation of ultrasound-based volumes with histology and therapeutic response highlights its translational promise. However, certain considerations merit further discussion. Ultrasound imaging, while accessible, is inherently operator-dependent, and its accuracy may decline with irregular or heterogeneous tumor morphology. Moreover, the exclusive reliance on the rat hepatoma cell line (N1S1) cells raises questions about generalizability to other HCC models with differing immune interactions. Future refinements should standardize training protocols, incorporate multimodal validation, and explore diverse tumor settings. Despite these limitations, the study provides a useful approach, and its broader integration could democratize preclinical oncology research, especially in resource-constrained environments.

Key Words: Hepatocellular carcinoma; Ultrasound imaging; Histology; Tumor growth monitoring; Tumor volumetry