THE 13th INTERNATIONAL CONGRESS ON MRI &
30th ANNUAL SCIENTIFIC MEETING OF KSMRM &
7th ANNUAL MEETING OF ASMRM

ICMRI & ASMRM 2025

Illuminating the Invisible: Advances in MRI
OCTOBER 31 - NOVEMBER 1, 2025
Grand Walkerhill Seoul, Seoul, Korea
https://icmri.ksmrm.org/2025m/

Abdomen 2

SY05-2

Arterial Enhancement Patterns of HCC: Exploring Pathologic, Genetic, and Prognostic Implications

Hyungjin Rhee

Severance Hospital, Korea

Hepatocellular carcinoma (HCC) develops through multiple stages of hepatocarcinogenesis, each characterized by specific alterations in vascular supply, venous drainage, and microvascular architecture. These vascular changes substantially influence the imaging appearance of HCC, thereby enabling noninvasive diagnosis. Arterial phase hyperenhancement is closely associated with the development of unpaired arteries and sinusoidal capillarization. Such changes begin in dysplastic nodules or early HCC and become fully established in moderately differentiated HCC. In poorly differentiated HCC, vascular density decreases while fibrosis and necrosis increase, resulting in diminished arterial enhancement. Therefore, careful evaluation of the arterial enhancement pattern often provides valuable clues to tumor differentiation. Moreover, vascular alterations and arterial phase enhancement in HCC are closely linked to aggressive histological and genetic features. Subtypes such as macrotrabecular-massive (MTM) HCC, vessels that encapsulate tumor clusters (VETC) HCC, scirrhous HCC, and HCCs harboring P53 mutations are frequently associated with relatively low arterial enhancement. Importantly, arterial enhancement patterns can also predict clinical outcomes, including early recurrence, advanced-stage recurrence, and overall survival. Poor prognostic enhancement patterns include rim arterial phase hyperenhancement, the presence of a hypovascular component exceeding 50% in the arterial phase, intratumoral arteries, and peritumoral arterial phase enhancement.

Keywords: *Hepatocellular carcinoma, Magnetic resonance imaging, Arterial phase enhancement, Gadoxetic acid*