

Discrimination of Dysplastic nodules from Well-differentiated (grade I) Hepatocellular Carcinoma on MR Imaging: Evaluation with LIRADS and OPTN criteria

Surachate Siripongsakun¹, Eugene K Choi¹, Stephanie Lin¹, Steven S Raman¹, and David SK Lu¹
¹Radiology, David Geffen School of Medicine at UCLA, Los Angeles, California, United States

Purpose: To assess the diagnostic performance of MRI characteristics, LIRADS and OPTN criteria in distinguishing well-differentiated hepatocellular carcinoma (HCC-gr1) from dysplastic nodules (DN).

Methods: A retrospective study of 69 nodules (23 DNs and 46 HCCs, gradeI) in 65 consecutive patients who underwent MRI with histopathology from January, 2000 to July, 2012 was performed. Two blinded abdominal imagers reviewed the MR characteristics including: T1WI and T2WI signal (including homogeneity), dynamic contrast enhancement, and the presence of a capsule and intratumoral fat. The Kappa value was used to assess the degree of interobserver agreement. Discrepant interpretations were reconciled in consensus. An assessment of the LIRADS and OPTN criteria was then performed. The categorical and continuous variables were analyzed using the Chi-square and student t-test.

Results: Overall inter-observer agreement was good (k=0.65-0.84). Significant difference of T1 and T2 signal, wash in/out and presence of capsule were observed (p<0.001 to 0.008). T2 hyperintensity, intratumoral fat and tumor capsule could be found in 4(17.4%), 3(13%) and 4(17.4%) of DNs, respectively. LIRADS assigned two DNs(8.7%) to LIRADS5 and one HCC(2.2%) to LIRADS3. OPTN assigned 5 DNs(21.7%) to OPTN5 and 10 HCCs(21.7%) to OPTN4.

Conclusion: MRI allows differentiation between DN and HCC (gradeI) but with some overlap appearance. LIRADS appears to be more accurate in categorizing between DN and HCC.

Table 1. Characteristics of HCC dysplastic nodules vs HCC grade I

	Dysplastic nodules	HCC grade I	p-value		Dysplastic nodules	HCC grade I	p-value
Total Number	23 (33.3%)	46 (66.7%)					
Mean size (cm)	2.7±1.7(SD)	3.8± 2.6(SD)	0.064	Hetero/Homogenous			0.06
T1 signal intensity			0.008	Homogenous	19 (82.6%)	27 (58.7%)	
Hyposignal	1 (4.3%)	17 (37.0%)		Heterogenous	4 (17.4%)	19 (41.3%)	
Isosignal	9 (39.1%)	8 (17.4%)		Fat			0.738
Hypersignal	13 (56.5%)	21 (45.7%)		Yes	3 (13.0%)	9 (19.6%)	
T2 signal intensity			< 0.001	No	20 (87%)	37 (80.4%)	
Hyposignal	12 (52.2%)	3 (6.5%)		Capsule (N=40)			0.001
Isosignal	7 (30.4%)	10 (21.7%)		Yes	2 (25%)	27 (84.4%)	
Hypersignal	4 (17.4%)	33 (71.7%)		No	6 (75%)	5 (15.6%)	
Hepatobiliary phase (N=29)			0.477	LI-RADS classification			< 0.001
Hyposignal	10 (66.7%)	12 (85.7%)		3	14 (60.9%)	1 (2.2%)	
Isosignal	3 (20%)	2 (14.3%)		4	7 (30.4%)	16 (34.8%)	
Hypersignal	2 (13.3%)	0		5	2 (8.7%)	29 (63%)	
Typical Wash in/out			< 0.001	OPTN classification			< 0.001
Yes	6 (26.1%)	37 (80.4%)		4	18 (78.3%)	10 (21.7%)	
No	17 (73.9%)	9 (19.6%)		5	5 (21.7%)	36 (78.2%)	

LI-RADS= Liver Imaging Reporting and Data System, OPTN= Organ Procurement and Transplantation Network