



Figure S1 Results of quality assessments of the articles according to the QUADAS-2 criteria. QUADAS-2, Quality Assessment of Diagnostic Accuracy Studies-2.

Table S1 Details of search strategy

History	Search query	Entry
Database: EMBASE (https://www.embase.com/)		
#1	'liver neoplasms'/exp OR 'liver neoplasms' OR (('liver'/exp OR liver) AND ('neoplasms'/exp OR neoplasms))	585608
#2	'liver neoplasms'/exp OR 'liver neoplasms' OR (('liver'/exp OR liver) AND ('neoplasms'/exp OR neoplasms)) OR 'neoplasms, hepatic' OR (('neoplasms,'/exp OR neoplasms,) AND hepatic) OR 'neoplasms, liver' OR (('neoplasms,'/exp OR neoplasms,) AND ('liver'/exp OR liver)) OR 'liver neoplasm'/exp OR 'liver neoplasm' OR 'neoplasm, liver' OR (('neoplasm,'/exp OR neoplasm,) AND ('liver'/exp OR liver)) OR 'hepatic neoplasms' OR 'hepatic neoplasm' OR 'neoplasm, hepatic' OR (('neoplasm,'/exp OR neoplasm,) AND hepatic) OR 'cancer of liver' OR 'hepatocellular cancer'/exp OR 'hepatocellular cancer' OR 'cancers, hepatocellular' OR (('cancers,'/exp OR cancers,) AND hepatocellular) OR 'hepatocellular cancers' OR 'hepatic cancer'/exp OR 'hepatic cancer' OR 'cancer, hepatic' OR (('cancer,'/exp OR cancer,) AND hepatic) OR 'cancers, hepatic' OR (('cancers,'/exp OR cancers,) AND hepatic) OR 'hepatic cancers' OR 'liver cancer'/exp OR 'liver cancer' OR 'cancer, liver'/exp OR 'cancer, liver' OR (('cancer,'/exp OR cancer,) AND ('liver'/exp OR liver)) OR 'cancers, liver' OR (('cancers,'/exp OR cancers,) AND ('liver'/exp OR liver)) OR 'liver cancers' OR 'cancer of the liver'/exp OR 'cancer of the liver' OR 'cancer, hepatocellular' OR (('cancer,'/exp OR cancer,) AND hepatocellular)	679052
#3	'carcinoma, hepatocellular'/exp OR carcinoma, hepatocellular	207359
#4	'carcinomas, hepatocellular' OR (carcinomas, AND hepatocellular) OR 'hepatocellular carcinomas' OR 'liver cell carcinoma, adult' OR (('liver'/exp OR liver) AND ('cell'/exp OR cell) AND ('carcinoma,'/exp OR carcinoma,) AND ('adult'/exp OR adult)) OR 'liver cancer, adult' OR (('liver'/exp OR liver) AND ('cancer,'/exp OR cancer,) AND ('adult'/exp OR adult)) OR 'adult liver cancer' OR 'adult liver cancers' OR 'cancer, adult liver' OR (('cancer,'/exp OR cancer,) AND ('adult'/exp OR adult) AND ('liver'/exp OR liver)) OR 'cancers, adult liver' OR (('cancers,'/exp OR cancers,) AND ('adult'/exp OR adult) AND ('liver'/exp OR liver)) OR 'liver cancers, adult' OR (('liver'/exp OR liver) AND ('cancers,'/exp OR cancers,) AND ('adult'/exp OR adult)) OR 'liver cell carcinoma'/exp OR 'liver cell carcinoma' OR 'carcinoma, liver cell'/exp OR 'carcinoma, liver cell' OR (('carcinoma,'/exp OR carcinoma,) AND ('liver'/exp OR liver) AND ('cell'/exp OR cell)) OR 'carcinomas, liver cell' OR (carcinomas, AND ('liver'/exp OR liver) AND ('cell'/exp OR cell)) OR 'cell carcinoma, liver' OR (('cell'/exp OR cell) AND ('carcinoma,'/exp OR carcinoma,) AND ('liver'/exp OR liver)) OR 'cell carcinomas, liver' OR (('cell'/exp OR cell) AND carcinomas, AND ('liver'/exp OR liver)) OR 'liver cell carcinomas' OR 'hepatocellular carcinoma'/exp OR 'hepatocellular carcinoma' OR 'hepatoma'/exp OR hepatoma OR hepatomas	442686
#5	#1 OR #2 OR #3 OR #4	707190
#6	'li rads'/exp OR 'li rads'	1123
#7	'lirads'/exp OR lirads	1152
#8	('liver imaging reporting' OR (('liver'/exp OR liver) AND ('imaging'/exp OR imaging) AND ('reporting'/exp OR reporting))) AND ('data system'/exp OR 'data system' OR (data AND system))	1246
#9	'lr 1' OR 'lr 2' OR 'lr 3' OR 'lr 4' OR 'lr 5' OR 'lr 5v' OR 'lr m' OR 'lr om' OR 'lr tiv' OR lr1 OR lr2 OR lr3 OR lr4 OR lr5 OR lrm OR lrom OR lr5v OR lrtiv	5374
#10	#6 OR #7 OR #8 OR #9	6394
#11	ceus OR 'contrast enhanced ultrasound'/exp OR 'contrast enhanced ultrasound' OR 'contrast-enhanced ultrasound'/exp OR 'contrast-enhanced ultrasound'	13121
#12	'sulfur hexafluoride'/exp OR 'sulfur hexafluoride' OR (('sulfur'/exp OR sulfur) AND hexafluoride) OR 'hexafluoride, sulfur' OR (hexafluoride, AND ('sulfur'/exp OR sulfur)) OR 'sonazoid'/exp OR sonazoid OR 'kupffer phase' OR 'post vascular phase' OR 'post-vascular phase'	8791
#13	#5 AND #10 AND #11 AND #12	75
Database: PubMed (PubMed (nih.gov))		
#1	"liver neoplasms"[MeSH Terms] OR Liver Neoplasms[Text Word] OR (Neoplasms, Hepatic) OR (Neoplasms, Liver) OR "Liver Neoplasm" OR (Neoplasm, Liver) OR "Hepatic Neoplasms" OR "Hepatic Neoplasm" OR (Neoplasm, Hepatic) OR "Cancer of Liver" OR "Hepatocellular Cancer" OR (Cancers, Hepatocellular) OR "Hepatocellular Cancers" OR "Hepatic Cancer" OR (Cancer, Hepatic) OR (Cancers, Hepatic) OR "Hepatic Cancers" OR "Liver Cancer" OR (Cancer, Liver) OR (Cancers, Liver) OR "Liver Cancers" OR "Cancer of the Liver" OR (Cancer, Hepatocellular)	354352
#2	("Liver Neoplasms"[Mesh]) AND "Carcinoma, Hepatocellular"[Mesh] OR (Carcinomas, Hepatocellular) OR "Hepatocellular Carcinomas" OR (Liver Cell Carcinoma, Adult) OR (Liver Cancer, Adult) OR "Adult Liver Cancer" OR "Adult Liver Cancers" OR (Cancer, Adult Liver) OR (Cancers, Adult Liver) OR (Liver Cancers, Adult) OR "Liver Cell Carcinoma" OR (Carcinoma, Liver Cell) OR (Carcinomas, Liver Cell) OR (Cell Carcinoma, Liver) OR (Cell Carcinomas, Liver) OR "Liver Cell Carcinomas" OR "Hepatocellular Carcinoma" OR Hepatoma OR Hepatomas	205498
#3	#1 or #2	384639
#4	LI-RADS OR LIRADS	710
#5	"liver imaging reporting and data system"	503
#6	LR-1 OR LR-2 OR LR-3 OR LR-4 OR LR-5 OR LR-5V OR LR-M OR LR-TIV OR LR1 OR LR2 OR LR3 OR LR4 OR LR5 OR LRM OR LROM OR LR5V OR LRTIV	3650
#7	#4 or #5 or #6	4097
#8	CEUS OR Contrast enhanced ultrasound OR Contrast-enhanced ultrasound	62728
#9	"sulfur hexafluoride"[MeSH Terms] OR sulfur hexafluoride[Text Word] OR (Hexafluoride, Sulfur) OR Sonazoid OR "Kupffer phase" OR "post vascular phase" OR "post-vascular phase"	3923
#10	#3 and #7 and #8 and #9	16

Table S1 (continued)

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History	Search query	Entry
Database: Cochrane Library (Cochrane Trusted evidence. Informed decisions. Better health.)		
#1	MeSH descriptor: [Liver Neoplasms] explode all trees	3910
#2	("liver neoplasms" OR (Neoplasms, Hepatic) OR (Neoplasms, Liver) OR "Liver Neoplasm" OR (Neoplasm, Liver) OR "Hepatic Neoplasms" OR "Hepatic Neoplasm" OR (Neoplasm, Hepatic) OR "Cancer of Liver" OR "Hepatocellular Cancer" OR (Cancers, Hepatocellular) OR "Hepatocellular Cancers" OR "Hepatic Cancer" OR (Cancer, Hepatic) OR (Cancers, Hepatic) OR "Hepatic Cancers" OR "Liver Cancer" OR (Cancer, Liver) OR (Cancers, Liver) OR "Liver Cancers" OR "Cancer of the Liver" OR (Cancer, Hepatocellular)):ti,ab,kw (Word variations have been searched)	17854
#3	MeSH descriptor: [Carcinoma, Hepatocellular] explode all trees	2393
#4	("Carcinoma, Hepatocellular" OR (Carcinomas, Hepatocellular) OR "Hepatocellular Carcinomas" OR (Liver Cell Carcinoma, Adult) OR (Liver Cancer, Adult) OR "Adult Liver Cancer" OR "Adult Liver Cancers" OR (Cancer, Adult Liver) OR (Cancers, Adult Liver) OR (Liver Cancers, Adult) OR "Liver Cell Carcinoma" OR (Carcinoma, Liver Cell) OR (Carcinomas, Liver Cell) OR (Cell Carcinoma, Liver) OR (Cell Carcinomas, Liver) OR " Liver Cell Carcinomas" OR "Hepatocellular Carcinoma" OR Hepatoma OR Hepatomas):ti,ab,kw (Word variations have been searched)	11645
#5	#1 or #2 or #3 or #4	20302
#6	(LI-RADS):ti,ab,kw (Word variations have been searched)	9
#7	(LIRADS):ti,ab,kw (Word variations have been searched)	9
#8	("liver imaging reporting and data system"):ti,ab,kw (Word variations have been searched)	3
#9	(Ir-1 OR Ir-2 OR Ir-3 OR Ir-4 OR Ir-5 OR Ir-5V OR Ir-M OR Ir-OM OR Ir-TIV OR Ir1 OR Ir2 OR Ir3 OR Ir4 OR Ir5 OR Ir M OR Ir OM OR Ir5V OR Ir TIV):ti,ab,kw (Word variations have been searched)	643
#10	#6 or #7 or #8 or #9	649
#11	(CEUS OR "Contrast enhanced ultrasound" OR "Contrast-enhanced ultrasound"):ti,ab,kw (Word variations have been searched)	376
#12	("sulfur hexafluoride" OR (Hexafluoride, Sulfur) OR Sonazoid OR "Kupffer phase" OR "post vascular phase" OR "post-vascular phase"):ti,ab,kw (Word variations have been searched)	205
#13	#5 and #10 and #11 and #12	1
Database: Web of Science		
	Search query	Entry
	(TS=("liver neoplasms") OR AB=(Liver Neoplasms OR Neoplasms, Hepatic OR Neoplasms, Liver OR "Liver Neoplasm" OR Neoplasm, Liver OR "Hepatic Neoplasms" OR "Hepatic Neoplasm" OR Neoplasm, Hepatic OR "Cancer of Liver" OR "Hepatocellular Cancer" OR Cancers, Hepatocellular OR "Hepatocellular Cancers" OR "Hepatic Cancer" OR Cancer, Hepatic OR Cancers, Hepatic OR "Hepatic Cancers" OR "Liver Cancer" OR Cancer, Liver OR Cancers, Liver OR "Liver Cancers" OR "Cancer of the Liver" OR Cancer, Hepatocellular) OR TS=(Carcinoma,Hepatocellular) OR AB=(Carcinomas, Hepatocellular OR "Hepatocellular Carcinomas" OR Liver Cell Carcinoma, Adult OR Liver Cancer, Adult OR "Adult Liver Cancer" OR "Adult Liver Cancers" OR Cancer, Adult Liver OR Cancers, Adult Liver OR Liver Cancers, Adult OR "Liver Cell Carcinoma" OR Carcinoma, Liver Cell OR Carcinomas, Liver Cell OR Cell Carcinoma, Liver OR Cell Carcinomas, Liver OR " Liver Cell Carcinomas" OR "Hepatocellular Carcinoma" OR Hepatoma OR Hepatomas))AND (AB=(LI-RADS OR LIRADS OR "liver imaging reporting and data system"OR Ir-1 OR Ir-2 OR Ir-3 OR Ir-4 OR Ir-5 OR Ir-5V OR Ir-M OR Ir-OM OR Ir-TIV OR Ir1 OR Ir2 OR Ir3 OR Ir4 OR Ir5 OR IrM OR IrOM OR Ir5V OR IrTIV)) AND (AB=(CEUS OR "Contrast enhanced ultrasound" OR "Contrast-enhanced ultrasound")) AND (TS=("sulfur hexafluoride") OR AB=(sulfur hexafluoride OR Hexafluoride, Sulfur OR Sonazoid OR "Kupffer phase" OR "post vascular phase" OR "post-vascular phase"))	11

Table S2 Data form

Background

Name of primary study

First author

Country

Center (single or multiple)

Journal

Year

Study design

Study period

Study design (retrospective or prospective)

Study type (case-control or cohort)

Subject enrollment (consecutive or selective or unclear)

Image reviewer (multiple or single; independently or consensus; and working experience)

Blind to other imaging or examinations or pathology? (YES/NO/UNCLEAR)

Patients

Number of patients

Male (n/%)

Average age

Cirrhosis (n/%)

Lesions

Number of lesions

Number of HCC

Number of OM

Number of benign

Lesion limited? (YES/NO)

Average lesion size (mm)

Reference standards

Interval between index test and pathological assessment

Interval between index test and follow-up

Reference standard for HCC

Reference standard for OM

Reference standard for benign

Number of patients with pathological assessment (%)

CEUS

Quantity of contrast agent

No. of US systems (Single or multiple)

Device/probe

Mechanical index

The modified LR5 category for HCC diagnosis

Sensitivity

Specificity

PPV

NPV

TP

FP

TN

FN

HCC, hepatocellular carcinoma; OM, other non-HCC malignancies; CEUS, contrast-enhanced ultrasound; LR5, Liver Imaging Reporting and Data System category 5; PPV, positive predictive value; NPV, negative predictive value; TP, true positive; FP, false positive; TN, true negative; FN, false negative.