INPLASY PROTOCOL

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Conflicts of interest:
None declared.

Prediction of Imaging features for microvascular invasion in hepatocellular carcinoma based on enhanced CT

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Review question / Objective: **To analysis the prediction value of imaging features about microvascular invasion in hepatocellular carcinoma.**
Condition being studied: **Microvascular invasion in heptatocellular carcinoma.**
Eligibility criteria: **1) HCC patients and MVI statue proven by pathological criteria, 2) preoperative CT, 3) outcome of interest was preoperative evaluation of CT features for diagnosing or predicting MVI, 4) clinical researches. Identify additional related articles by reviewing citations of the publishes.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 June 2022 and was last updated on 18 June 2022 (registration number INPLASY202260078).

INTRODUCTION

Review question / Objective: **To analysis the prediction value of imaging features about microvascular invasion in hepatocellular carcinoma.**

Condition being studied: **Microvascular invasion in heptatocellular carcinoma.**

METHODS

Search strategy: **Pubmed # 1: ((((((portal vein[Title/Abstract]) OR (Portal*[Title/Abstract])) OR (microvascular*[Title/Abstract])) OR (micro-vascular*[Title/Abstract])) OR (microvessel*[Title/Abstract])) OR (microscop*[Title/Abstract]))**

OR (microvasculatur*[Title/Abstract]) (961386)

2: (((((((emboli[Title/Abstract]) OR (thrombi[Title/Abstract])) OR (thrombosis[Title/Abstract])) OR (microemboli[Title/Abstract])) OR (microthrombi[Title/Abstract])) OR (microthrombosis[Title/Abstract])) OR (Invasion*[Title/Abstract])) OR (Invasiveness[Title/Abstract])) OR (microinvasion[Title/Abstract])

#3: # 1 AND # 2

#4: #3 OR MVI

#5: ((((((((((((((((((Neoplasm*, Hepatic[Title/Abstract]) OR (Neoplasm*, Liver[Title/Abstract])) OR (Liver Neoplasm[Title/Abstract])) OR (Hepatic Neoplasm*[Title/Abstract])) OR (Cancer of Liver[Title/Abstract])) OR (Hepatocellular Cancer[Title/Abstract])) OR (Cancer*, Hepatocellular[Title/Abstract])) OR (Hepatocellular Cancers[Title/Abstract])) OR (Hepatic Cancer*[Title/Abstract])) OR (Cancer*, Hepatic[Title/Abstract])) OR (Cancer*, Liver[Title/Abstract])) OR (Liver Cancer*[Title/Abstract])) OR (Cancer of the Liver*[Title/Abstract])) OR (Carcinomas,Hepatocellular[Title/Abstract])) OR (Hepatocellular Carcinoma*[Title/Abstract])) OR (Liver Cell Carcinoma*[Title/Abstract])) OR (Carcinoma*, Liver Cell[Title/Abstract])) OR (Cell Carcinoma*, Liver[Title/Abstract])) OR (Hepatoma*[Title/Abstract])) OR (HCC[Title/Abstract])

#6: #4 AND #5

#7: ((((((((((((CECT[Title/Abstract]) OR (contrast enhanc*[Title/Abstract])) OR (X-Ray Comput* Tomography[Title/Abstract])) OR (CT[Title/Abstract])) OR (comput* tomograph*[Title/Abstract])) OR (CT Scan*[Title/Abstract])) OR (Helical CT*[Title/Abstract])) OR (CT X Ray*[Title/Abstract])) OR (Tomography, X-Ray Computed[Title/Abstract])) OR (Tomography, Spiral Computed[Title/Abstract])) OR (Contrast Media[Title/Abstract])) OR (DCE-CT[Text Word])) OR (DCE[Text Word] AND CT[Text Word])) OR (perfusion[Text Word])

#8: #6 AND #7

Embase

#1: 'portal vein':ab,ti OR portal*:ab,ti OR microvascular*:ab,ti OR 'microvascular*':ab,ti OR microvessel*:ab,ti OR microscop*:ab,ti OR microvasculatur*:ab,ti

#2: emboli:ab,ti OR thrombi:ab,ti OR thrombosis:ab,ti OR microemboli:ab,ti OR microthrombi:ab,ti OR microthrombosis:ab,ti OR invasion*:ab,ti OR invasiveness:ab,ti OR microinvasion:ab,ti

#3: #1 AND #2

#4: #3 OR MVI

#5: 'neoplasm*, hepatic':ab,ti OR 'neoplasm*, liver':ab,ti OR 'liver neoplasm':ab,ti OR 'hepatic neoplasm*':ab,ti OR 'cancer of liver':ab,ti OR 'hepatocellular cancer':ab,ti OR 'cancer*, hepatocellular':ab,ti OR 'hepatocellular cancers':ab,ti OR 'hepatic cancer*':ab,ti OR 'cancer*, hepatic':ab,ti OR 'cancer*, liver':ab,ti OR 'liver cancer*':ab,ti OR 'cancer of the liver*':ab,ti OR carcinomas,hepatocellular:ab,ti OR 'hepatocellular carcinoma*':ab,ti OR 'liver cell carcinoma*':ab,ti OR 'carcinoma*, liver cell':ab,ti OR 'cell carcinoma*, liver':ab,ti OR hepatoma*:ab,ti OR hcc:ab,ti

#6: #4 AND #5

#7: cect:ti,ab,kw OR 'contrast enhanc*':ti,ab,kw OR 'x-ray comput* tomography':ti,ab,kw OR ct:ti,ab,kw OR 'comput* tomograph*':ti,ab,kw OR 'ct scan*':ti,ab,kw OR 'helical ct*':ti,ab,kw OR 'ct x ray*':ti,ab,kw OR 'tomography, x-ray computed':ti,ab,kw OR 'tomography, spiral computed':ti,ab,kw OR 'contrast media':ti,ab,kw OR 'dce ct':ti,ab,kw OR perfusion:ti,ab,kw

#10:#7 AND # 6

Web of science

1: portal vein (Topic) or Portal* (Topic) or microvascular* (Topic) or micro-vascular* (Topic) or microvessel* (Topic) or microscop* (Topic) or microvasculatur* (Topic) (3352201)

2: (((((((emboli(Topic)) OR (thrombi(Topic))) OR (thrombosis(Topic))) OR (microemboli(Topic))) OR (microthrombi(Topic))) OR (microthrombosis(Topic))) OR (Invasion*(Topic))) OR (Invasiveness(Topic))) OR (microinvasion(Topic))

#3: # 1 AND # 2
#4::#3 OR MVI
#5: neoplasm*, hepatic (Topic) or neoplasm*, liver (Topic) or liver neoplasm (Topic) or hepatic neoplasm* (Topic) or cancer of liver (Topic) or hepatocellular cancer (Topic) or cancer*, hepatocellular (Topic) or hepatocellular cancers (Topic) or hepatic cancer* (Topic) or cancer*, hepatic (Topic) or cancer*, liver (Topic) or liver cancer* (Topic) or cancer of the liver* (Topic) or carcinomas,hepatocellular (Topic) or hepatocellular carcinoma* (Topic) or liver cell carcinoma* (Topic) or carcinoma*, liver cell (Topic) or cell carcinoma*, liver (Topic) or hepatoma* (Topic) or hcc (Topic)
#6: cect (Topic) or contrast enhanc* (Topic) or x-ray comput* tomography (Topic) or ct (Topic) or comput* tomograph* (Topic) or ct scan* (Topic) or helical ct (Topic) or ct x ray* (Topic) or tomography, x-ray computed (Topic) or tomography, spiral computed (Topic) or contrast media (Topic) or dce ct (Topic) or perfusion (Topic)
#7: #4 AND #5 AND #6
Cochrane
1: (portal vein):ti,ab,kw OR (Portal*):ti,ab,kw OR (microvascular*):ti,ab,kw OR (microvascular*):ti,ab,kw OR (microvessel*):ti,ab,kw OR (microscop*):ti,ab,kw OR (microvasculatur*):ti,ab,kw
#2: (emboli):ti,ab,kw OR (thrombi):ti,ab,kw OR (thrombosis):ti,ab,kw OR (microemboli):ti,ab,kw OR (microthrombi):ti,ab,kw OR (microthrombosis):ti,ab,kw OR (Invasion*):ti,ab,kw OR (Invasiveness):ti,ab,kw OR (microinvasion):ti,ab,kw
#3: # 1 AND #2
#4: (liver):ti,ab,kw OR (Invasion*):ti,ab,kw OR (hepato*):ti,ab,kw OR (hepatic):ti,ab,kw
#5: (cancer*):ti,ab,kw OR (tumor*):ti,ab,kw OR (neoplas*):ti,ab,kw OR (carcinoma*):ti,ab,kw OR (maligna*):ti,ab,kw
#6: #4 AND #5
#7: (cect):ti,ab,kw OR (contrast enhanc*):ti,ab,kw OR (x-ray comput* tomography):ti,ab,kw OR (ct):ti,ab,kw OR (comput* tomograph*):ti,ab,kw OR (ct scan*):ti,ab,kw OR (helical ct):ti,ab,kw OR (ct x ray*):ti,ab,kw OR (tomography, x-ray computed):ti,ab,kw OR (tomography, spiral computed):ti,ab,kw OR (contrast media):ti,ab,kw OR (dce ct):ti,ab,kw OR (perfusion):ti,ab,kw
#8: #3 AND #6 AND #7 AND database: trials.

Participant or population: Hepatocellular carcinoma.

Intervention: Enhanced CT.

Comparator: No.

Study designs to be included: Observational clinical study.

Eligibility criteria: 1) HCC patients and MVI statue proven by pathological criteria, 2) preoperative CT, 3) outcome of interest was preoperative evaluation of CT features for diagnosing or predicting MVI, 4) clinical researches. Identify additional related articles by reviewing citations of the publishes.

Information sources: Article and electronic databases.

Main outcome(s): Preoperative evaluation of CT features for diagnosing or predicting MVI.

Quality assessment / Risk of bias analysis: I2 >50% was considered as the presence of considerable heterogeneity based on the Higgins I2 statistic. To clarify the threshold effect, we calculated Spearman's correlation coefficient between sensitivity and the false-positive rate(correlation coefficient >0.6 : substantial threshold effect).

Strategy of data synthesis: We assessed all CT features that had been showed in a minimum of 4 articles regardless of their statistical significance. The diagnostic odds ratio(DOR) and its 95% confidence interval (CI) were calculated for each CT feature using random-effects model to determine the predictive performance for

MVI. The diagnostic power of eligible studies also was described through summary receiver operating characteristic (sROC) curve with area under the curve (AUC) . The AUC of 0.5–0.7, 0.7–0.9, and >0.9 indicate low, moderate, and high diagnostic power, respectively. The statistical analyses were produced via STATA version 15.0 , Review manager 5.4 and Meta-DiSc version 1.4.

Subgroup analysis: Base on the fetures from different tumor degion, we conducted the sub-group analysis.

Sensitivity analysis: We try to delete any article in order to ensure their sensititity involving DOR and 95%CI.

Country(ies) involved: China.

Keywords: enhanced CT, tumor margin, peri-tumoral enhancement, Internal arteries.

Contributions of each author:
Author 1 - Xue Yang.
Author 2 - XiaoFei Zhao.
Author 3 - Liang Di.
Author 4 - GuoQing Shao.
Author 5 - Yu Qi.
Author 6 - JiaoJiao Liu.
Author 7 - Chao Cai.
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