Appendix 1. The PubMed database search strategy

Search Number	Query
#1	“Hepatocellular carcinoma”
#2	“Hepatoma”
#3	“Liver cell carcinomas”
#4	“Liver cancer”
#5	“Hepatic carcinoma”
#6	“HCC”
#7	“Rupture”
#8	#1 OR #2 OR #3 OR #4 OR #5 OR #6
#9	#7 AND #8

Appendix 2. Downs and Black modified critical appraisal tool

Criteria	Clarification	Score
1. Is the hypothesis/aim/objective of the study clearly described?	The word “aim” should be specified in the paper	Yes: 1 No: 0
2. Are the main outcomes to be measured clearly described in the introduction or methods section?	If the main outcomes are first mentioned in the Results section, the question should be answered no.	Yes: 1 No: 0
3. Are the characteristics of the patients included in the study clearly described?	In cohort studies and trials, inclusion and/or exclusion criteria should be given. In case-control studies, a case-definition and the source for controls should be given.	Yes: 1 No: 0
4. Are the distributions of principal confounders in each group of subjects to be compared clearly described?	A list of principal confounders is provided.	Yes: 2 partially: 1 No: 0
5. Are the main findings of the study clearly described?	Simple outcome data (including denominators and numerators) should be reported for all major findings so that the reader can check the major analyses and conclusions.	Yes: 1 No: 0
6. Does the study provide estimates of the random variability in the data for the main outcomes?	In non normally distributed data the inter-quartile range of results should be reported. In normally distributed data thestandard error, standard deviation or confidence intervals should be	Yes: 1 No: 0

	reported.	
7. Have all important adverse events that may be a consequence of the intervention been reported?	This should be answered yes if the study demonstrates that there was a comprehensive attempt to measure adverse events.	Yes: 1 No: 0
8. Have the characteristics of patients lost to follow-up been described?	This should be answered yes where there were no losses to follow-up or where losses to follow-up were so small that findings would be unaVected by their inclusion. This should be answered no where a study does not report the number of patients lost to follow-up.	Yes: 1 No: 0
9. Have actual probability values been report-ed (e.g. 0.035 rather than < 0.05) for the main outcomes except where the probability value is less than 0.001?		Yes: 1 No: 0
10. Were the subjects asked to participate in the study representative of the entire population from which they were recruited?	The study must identify the source population for patients and describe how the patients were selected.Patients would be representative if they comprised the entire source population, an unselected sample of consecutive patients, or a random sample. Random sampling is only feasible where a list of all members of the relevant population exists. Where a study does not report the proportion of the source population from which the patients are derived,the question should be answered as unable to determine.	Yes: 1 No: 0 unable to determine: 0
11. Were the staff, places, and facilities where the patients were treated, representative of the treatment the majority of patients receive?	For the question to be answered yes the study should demonstrate that the intervention was representative of that in use in the source population. The question should be answered no if, for example, the intervention was undertaken in a specialist centre unrepresentative of the hospitals most of the source population would attend.	Yes: 1 No: 0 unable to determine: 0
12. If any of the results of the study were based on “data dredging”, was this made clear?	Any analyses that had not been planned at the outset of the study should be clearly indicated. If no retrospective unplanned subgroup analyses were reported, then answer yes.	Yes: 1 No: 0 unable to determine: 0

13. In trials and cohort studies, do the analyses adjust for diVerent lengths of follow-up of patients, or in case-control studies, is the time period between the intervention and outcome the same for cases and controls?	Where follow-up was the same for all study patients the answer should yes. If diVerent lengths of follow-up were adjusted for by,for example, survival analysis the answer should be yes. Studies where diVerences in follow-up are ignored should be answered no.	Yes: 1 No: 0 unable to determine: 0
14. Were the statistical tests used to assess the main outcomes appropriate?	The statistical techniques used must be appropriate to the data. For example nonparametric methods should be used for small sample sizes. Where little statistical analysis has been undertaken but where there is no evidence of bias, the question should be answered yes. If the distribution of the data (normal or not) is not described it must be assumed that the estimates used were appropriate and the question should be answered yes.	Yes: 1 No: 0 unable to determine: 0
15. Were the main outcome measures used accurate (valid and reliable)?	For studies where the outcome measures are clearly described, the question should be answered yes. For studies which refer to other work or that demonstrates the outcome measures are accurate, the question should be answered as yes.	Yes: 1 No: 0 unable to determine: 0
16. Were study subjects in diVerent intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited over the same period of time?	For a study which does not specify the time period over which patients were recruited,the question should be answered as unable to determine.	Yes: 1 No: 0 unable to determine: 0
17. Was there adequate adjustment for confounding in the analyses from which the main findings were drawn?	This question should be answered no for trials if: the main conclusions of the study were based on analyses of treatment rather than intention to treat; the distribution of known confounders in the diVerent treatment groups was not described; or the distribution of known confounders diVered between the treatment groups but was not taken into account in the analyses. In nonrandomised studies if the eVect of the main confounders was not investigated or confounding was demonstrated but no adjustment was made in the final analyses the question should be answered as no.	Yes: 1 No: 0 unable to determine: 0

Note: This checklist assesses 27 items categorised into (1) reporting, (2) external validity, (3) internal validity-bias, (4) internal validity-confounding, and (5) power. For the purpose of this systematic review, items 4, 12, 14, 15, 19, 21, 23, 24, 26 and 27 will not be considered as they address aspects related to longitudinal studies.

Appendix 3. Use Downs and Black checklist to assess the quality of the included literature

Study	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Total Score
Cheng et al （2021）	1	1	1	1	1	1	0	1	1	1	0	1	0	1	1	1	1	14
Zhou et al (2020)	1	1	1	1	1	0	0	0	1	1	0	1	1	1	1	1	1	13
Zou et al (2019)	1	1	1	0	1	0	1	1	1	1	0	0	0	1	1	1	0	11
Nykänen et al (2019)	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	15
Patidar et al (2019)	1	1	1	0	1	0	0	1	1	1	0	1	0	1	1	1	0	11
Lee et al (2019)	1	0	1	0	1	1	0	1	1	0	0	1	0	1	1	1	1	11
Zhang et al (2018)	1	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	1	14
Shinmura et al (2018)	1	1	1	1	1	0	0	0	1	0	1	1	1	1	1	1	1	13
Fan et al （2017）	1	1	1	1	1	0	0	0	1	0	0	1	0	1	1	1	1	11
Wu et al (2016)	1	1	1	0	1	0	0	0	1	0	0	1	0	1	1	1	1	10
Feng et al (2016)	1	1	1	1	1	1	0	0	1	0	1	0	0	1	1	1	1	12
Monroe et al (2015)	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	14
Yang et al (2014)	1	1	0	0	1	1	0	0	1	0	0	1	0	1	1	1	1	10

Lin et al (2014)	1	1	1	0	1	0	1	0	0	0	0	1	0	1	1	1	1	10
Jin et al （2013）	1	0	1	1	0	1	0	0	1	0	0	0	0	1	1	1	1	9
Kiin et al （2012）	0	0	0	0	0	0	1	1	1	0	0	0	1	1	1	1	1	8
Zhang et al (2012)	1	1	0	0	1	1	0	0	1	0	0	1	0	1	1	1	1	10
Shin et al （2010）	1	1	1	0	1	0	0	0	1	0	0	1	1	1	1	1	1	11
Bassi et al （2010）	1	1	0	1	1	0	0	1	1	0	0	0	0	1	1	1	1	10
Li et al (2009)	1	1	0	0	1	0	1	0	1	0	0	0	1	1	1	1	1	10
Kirikoshi et al (2009)	1	1	1	0	1	0	0	1	0	0	0	0	0	1	1	1	1	9
Kung et al (2008)	1	0	1	1	1	0	0	1	1	0	0	0	1	1	1	1	1	11
Tan et al (2006)	1	1	0	0	0	0	0	0	1	0	0	1	0	1	1	1	0	7
Castells et al (2001)	1	0	1	0	1	1	1	0	1	0	0	0	1	0	1	1	1	10
Liu et al (2001)	1	1	0	0	1	1	0	0	1	0	0	0	0	1	1	1	1	9

Note: Judgment of each question: Yes =1 score, no or not mentioned = 0 score and the full score is 17 points. The higher the final score of literature, the lower the possibility of bias and the higher the quality of literature. We divided the final score into 0~5 for low quality literature, 6~11 for medium quality literature and 12~17 for high quality literature. In this study, literatures with a score of no less than 6 were included in the meta-analysis.