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REVIEW ARTICLE

Survival following redo hepatectomy vs radiofrequency ablation for recurrent hepatocellular carcinoma: a systematic review and meta-analysis

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Abstract

Background: Redo hepatic resection (RHR) and radiofrequency ablation (RFA) are salvage treatment choices for recurrent hepatocellular carcinoma (RHCC). As yet, it is unclear as to which treatment modality is superior in terms of long term survival. The aim of this study was to compare the survival benefits and treatment efficacy of RHR and RFA for recurrent HCC.

Methods: A literature review using the EMBASE, Medline, Google scholar, and Cochrane databases was performed. Meta-analyses were performed using an inference of variance, random effects model for 1, 3 and 5-year Disease Free Survival (DFS) and Overall Survival (OS). Secondary outcomes were major morbidity and mortality.

Results: Five retrospective studies including 639 patients were eligible. Overall, there were no differences in 1, 3 and 5-year DFS or OS for patients undergoing RHR or RFA for recurrent HCC. Comparison between the two groups demonstrated similar 5-year DFS (HR 0.86, 95% CI 0.67–1.11, $p = 0.250$) and 5-year OS (HR 1.03, 95% CI 0.83–1.27, $p = 0.082$). However, RFA had a lower morbidity rate (2%) compared with RHR (17%, $p < 0.001$).

Conclusion: This study demonstrates, neither RHR nor RFA appeared to be superior in terms of DFS and OS. Well-constructed, randomised, multicenter trials will be required to determine if a true difference exists.

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Introduction

In patients who fulfil the criteria for liver transplantation, the most beneficial treatment for recurrent hepatocellular carcinoma (RHCC) is salvage transplantation as it removes both the tumour, the cirrhotic liver and conveys the most favourable survival benefits.[1,2] However, organ availability limits the number of patients that may benefit from this treatment. Therefore, (RHR) and (RFA) are offered as alternative curative modalities.

Several published studies have reported either equivocal outcomes between the two treatment modalities or favourable outcomes for one or the other.[3–9] However, as yet, the efficacy of these two treatments in terms of long term survival are unclear. Additionally the criteria for patient selection for each of these treatments remain poorly defined. The aim of this systematic review and meta-analysis was to determine if there are differences in the DFS and OS following treatment with RHR or RFA for recurrent hepatocellular carcinoma.

Methods

This systematic review and meta-analysis was performed in accordance with the Preferred Reporting In Systematic Reviews and Meta-Analysis (PRISMA) statement checklist.

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Two of the authors (PG and DA) independently carried out a systematic review of the literature. The search was restricted to the English language and used Medline, EMBASE, Cochrane Library and Google Scholar databases in June 2016 without restriction on publication date. The following keywords using both their MESH terms and free text were used: 'repeated; redo', 'liver resection', 'hepatic resection', 'hepatectomy', 'laparoscopic', 'open', 'percutaneous', 'radiofrequency ablation', 'recurrent' and 'hepatocellular carcinoma'. A grey literature search of the following clinical trial registry websites was also performed: National Health Service – The National Research Register, clinicaltrials.gov, current controlled trials and NEAR website. References of retrieved articles were also crosschecked manually for further studies.

Study selection

Only studies that compared survival differences between open/laparoscopic RHR open/laparoscopic/percutaneous RFA were included in the review. Studies with less than five patients were excluded.

Data extraction

The following data were extracted from the included studies: number of patients in the RHR and RFA groups, age, presence of cirrhosis, alpha-fetoprotein, primary tumour size, time to first recurrence, size of recurrent tumour, major morbidity, mortality, Disease Free Survival (DFS) and 1,3 and 5-year Overall Survival (OS).

Definitions

Overall Survival was defined the period from the date of treatment of the first recurrent HCC to the date of death related to any cause. Disease free survival was defined the period from the date of treatment of the first recurrent HCC to the date of the second recurrence or death related to any cause.

Statistical analysis

Hazard Ratios (HR) from included studies were pooled for the outcomes of DFS and 1, 3, 5-year OS. An inference of variance method, random effects model was used to generate an overall effect size and the accompanying 95% Confidence Intervals (95% CI). A p value of 0.05 or less was considered statistically significant. Statistical heterogeneity was assessed using the I^2 test. Publication bias was assessed using a funnel plot. All statistical analyses were carried out using Review Manager 5.3 software (Cochrane collaboration, Oxford, England).[10]

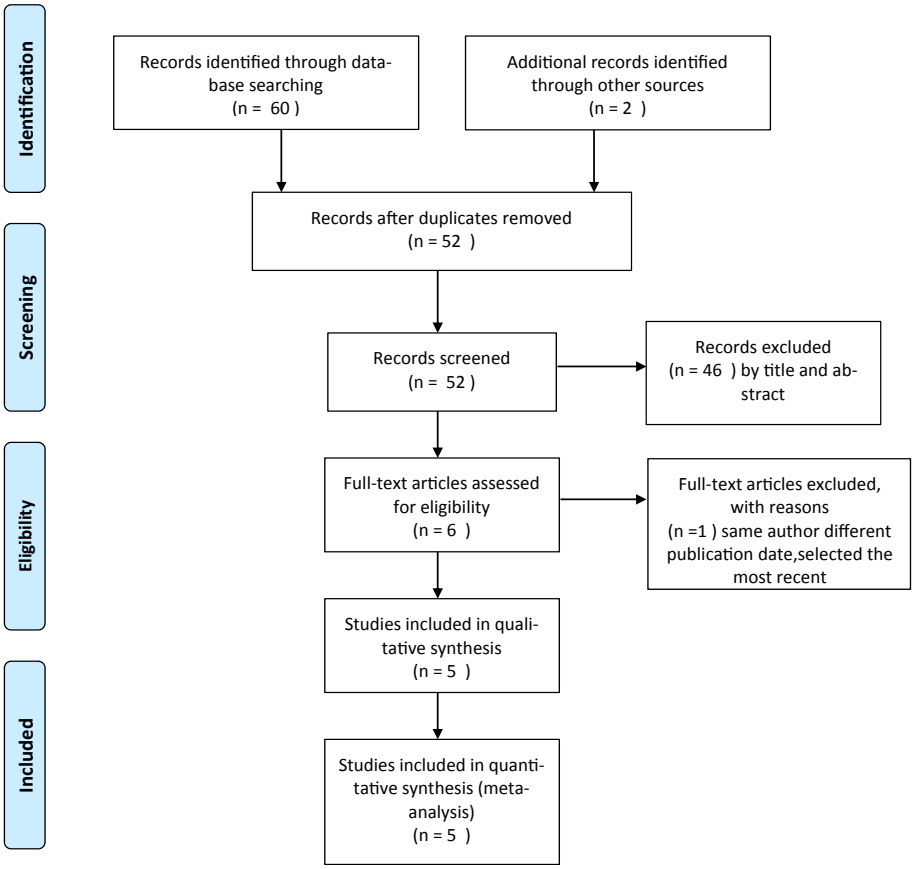

Figure 1 Flow diagram of identification and selection of studies

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