A systematic review on the clinical benefit and role of radiofrequency ablation as treatment of colorectal liver metastases

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CRD summary
This review assessed the role of radio frequency ablation in treatment of colorectal cancer liver metastases and concluded that it was a useful adjunct to hepatectomy and/or chemotherapy in well-selected patients. Given the uncertain quality of the included studies, variation across studies and lack of variance estimates, the authors conclusions should be interpreted with caution.

Authors' objectives
To evaluate the role of radiofrequency ablation for treatment of colorectal cancer liver metastases (CLMs).

Searching
MEDLINE was searched for published articles to August 2008; search terms were reported. Reference lists of relevant articles were searched to identify additional articles.

Study selection
Eligible studies included at least 40 patients with CLM who received radiofrequency ablation treatment with a median follow-up of at least 18 months and reported three-year or longer overall survival rates. Excluded studies included liver tumours other than CLM or those where data were not presented separately for CLM; for studies where data were published twice the study with least patients was excluded. Access routes were: percutaneous; laparoscopic, mixed percutaneous, laparoscopic and open; and open. The electrode types included: expandable; internally cooled; internally cooled and expandable; and internally cooled, expandable and perfused electrodes. In the included studies the size of metastases treated per patient ranged from 0.2cm to 13.5cm and the number of metastases ranged from one to 12. The outcomes of interest were overall survival, local progression, local recurrence, systemic progression and complications.

The authors stated neither how papers were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
The following data were extracted for each study: rate of and time to local and systemic progression; median length and rate at three years or more overall survival; median length and rate at two years of progression-free survival; and complication rates.

The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
Studies were combined in a narrative synthesis, supported by tables.

Results of the review
A total of 21 studies were included in the review (n=2,984, range 40 to 665): 13 studies clinical series and eight non-randomised comparative studies. Radiofrequency ablation site recurrence rates following percutaneous treatment ranged from 9% to 42% and following open radiofrequency ablation ranged from 5% to 14%. Median time to local tumour progression ranged from 1.5 to 39 months and median follow-up from 17 to 68 months.

Median and 5-year overall survival ranged from 24 to 59 months and 18% to 40% when calculation began after time
of radiofrequency ablation treatment (12 studies) and from 37 to 63 months and 21% to 54% (six studies) from the
time of diagnosis of CLM. Median and 5-year overall survival ranged from 36 to 45 months and 27% to 30% (five
studies) after radiofrequency ablation combined with resection and for resection alone ranged from 41 to 80 months
and 48% to 71% (six studies). Median progression-free survival after radiofrequency ablation alone ranged from six to
13 months (five studies) and the proportion of patients with progression free survival at two years ranged from 17% to
55% (five studies).

Following open radiofrequency ablation, complication rates ranged from 13% to 27% and major complication rates
from 3.5% to 13% (six studies). Following percutaneous radiofrequency ablation, complication rates ranged from
1.8% to 13% and major complication rates from 0.9% to 7% (11 studies). Mortality rates were 0 to 3.7% following
open radiofrequency ablation (six studies) and 0% following percutaneous radiofrequency ablation (11 studies).
Comparative studies indicated significantly improved overall survival following radiofrequency ablation versus
chemotherapy alone (one study), radiofrequency ablation plus chemotherapy versus radiofrequency ablation alone
(two studies) and up-front radiofrequency ablation versus radiofrequency ablation following second-line chemotherapy
(one study).

Authors' conclusions
Radiofrequency ablation prolonged time without toxicity and survival as an adjunct to hepatectomy and/or
chemotherapy in well-selected patients, but not as an alternative to resection.

CRD commentary
The review question and inclusion criteria were clear. The authors searched only one database for published studies
and it was unclear whether language restrictions were applied; therefore, it was possible that the searches may have
excluded some relevant studies and introduced publication and language biases. The methods used for study selection
and data extraction were not reported and it was unclear whether methods were used to minimise error and bias. No
assessment of study quality was undertaken, which made it difficult to assess the reliability of included data. None of
the continuous outcome measures included any estimates of variance. Heterogeneity between studies made the
decision to employ a narrative synthesis appropriate. This review concluded that radio frequency ablation for treatment
of colorectal cancer liver metastases was a useful adjunct to hepatectomy and/or chemotherapy in well-selected
patients. Given the uncertain quality of the included studies, variation across studies and lack of variance estimates, the
authors conclusions should be interpreted with caution.

Implications of the review for practice and research
Practice: The authors stated that radiofrequency ablation was a useful adjunct to surgery and chemotherapy in well-
selected patients with unresectable CLM. For surgical candidates with extensive liver-confined CLM, open
radiofrequency ablation may extend the limits of resection and contribute to complete eradication of the disease. For
non-surgical candidates with limited pre-dominant or liver-only CLM, percutaneous radiofrequency ablation may
eradicate measurable disease.

Research: The authors stated that the clinical benefits of radiofrequency ablation should be verified in randomised
studies.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.