Radiofrequency ablation for breast cancer: a review of the literature

CRD summary
This review, which examined the treatment of breast cancer with radiofrequency ablation (RFA), concluded that RFA appears to be a promising new tool for minimally invasive ablation of small carcinomas of the breast. However, given the several limitations of the review, the authors’ conclusions may not be reliable.

Authors’ objectives
To assess radiofrequency ablation (RFA) for the treatment of breast cancer.

Searching
PubMed, EMBASE and the Cochrane Library were searched.

Study selection
Studies involving patients with breast cancer, diagnosed using fine-needle aspiration or core needle biopsy were eligible for inclusion. The included studies involved patients with invasive or noninvasive breast cancer measuring between 0.5 and 3.0 centimetres, or locally advanced stage III breast cancer measuring between 4.0 and 7.0 centimetres. The patients were aged between 33 and 80 years, and tumours were situated 1 cm or more from the skin or skin and chest wall, where stated.

Studies using RFA were eligible for inclusion. The included studies used different generators and electrode probes, with or without temperature feedback, and used ultrasound to monitor the adequacy of ablation. Mean times for RFA ranged from 13.8 to 30 minutes, and initial power settings from 10 to 36 watts, with a maximum of approximately 60 watts. Time intervals between RFA and the excision of breast lesions were immediate or between 1 and 3 weeks.

No inclusion criteria were specified for the outcomes of interest or study design. The included studies were phase II trials that reported the percentage of complete tumour ablation and surgical complications.

The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

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

Data extraction
Complete ablations were reported as percentages. The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
The results were presented as a narrative synthesis and in a table.

Differences between patient and tumour characteristics and ablation settings were presented as a narrative synthesis and in tables.

Results of the review
Six phase II studies (n=93) were included in the review. Sample sizes were between 5 and 26 patients.

The included studies reported between 80% and 100% complete ablation.

Three studies reported complications potentially related to RFA, including one patient with breast ecchymosis and two patients with minimal skin burn, one of which also had mild discomfort. Two studies investigated levels of pain, with
one study reporting low average pain and another study reporting moderate discomfort.

**Authors' conclusions**

RFA appears to be a promising new tool for minimally invasive ablation of small carcinomas of the breast.

**CRD commentary**

The review question was not very clear, and the inclusion criteria were limited and not clearly defined. Relevant literature searches were undertaken using three electronic databases, but the search dates were not reported. In addition, it is possible that relevant papers might have been missed since the language of publication was not reported and there was no apparent search for unpublished material. The absence of a validity assessment means that the reliability of the included studies and their subsequent synthesis is unclear. Details of the methods of data extraction were not provided and the review process was not clear, which means that reviewer error and bias cannot be ruled out. The narrative synthesis was appropriate but limited due to methodological differences between the included studies. Potential clinical heterogeneity was not investigated. Sample sizes were small. Given the several limitations of the review, the authors' conclusions may not be reliable.

**Implications of the review for practice and research**

Practice: The authors did not state any implications for practice.

Research: The authors stated that further research is needed to identify the most effective RFA technique, including dosage, and most effective image guidance techniques. An assessment of long-term oncological and cosmetic effects is also required.

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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.