Radiation effects on the cosmetic outcomes of immediate and delayed autologous breast reconstruction: an argument about timing
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CRD summary
This review determined the optimal timing of radiotherapy in relation to autologous breast reconstruction in women with breast cancer. The authors concluded that limited evidence suggests that delaying breast reconstruction until after radiotherapy appears safer, but the findings should be interpreted with great caution. The authors’ suitably cautious conclusions reflect the limited evidence from predominantly retrospective studies.

Authors' objectives
To determine the optimal timing of radiotherapy in relation to autologous breast reconstruction in women being treated for breast cancer.

Searching
MEDLINE, EMBASE, CINAHL, PsycINFO and 'the specialised register of the Cochrane review group' were searched from 1966 to May 2004; the search terms were reported. The reference lists of the main studies were screened.

Study selection
Study designs of evaluations included in the review
Studies of any design with at least 20 patients were eligible for inclusion. Where reported, the duration of follow-up ranged from a mean of 19 to 60 months.

Specific interventions included in the review
Studies of radiotherapy that preceded delayed autologous breast reconstruction or followed immediate reconstruction were eligible for inclusion. The included studies evaluated radiotherapy before or after reconstruction, or no radiotherapy.

Participants included in the review
Studies of women who had undergone any type of mastectomy for breast cancer followed by autologous breast reconstruction were eligible for inclusion. Studies of women with failed previous breast conservation and radiotherapy who went on to have mastectomy and autologous breast reconstruction were included. Studies of women who only had breast reconstruction without radiotherapy or prosthetic construction alone were excluded. Most women received the transverse rectus abdominus musculocutaneous (TRAM) flap type of reconstruction. The mean age of the women ranged from 45 to 49 years.

Outcomes assessed in the review
The primary outcome of interest was cosmetic appearance (appearance, volume and symmetry). The secondary outcomes were immediate and delayed complications.

How were decisions on the relevance of primary studies made?
One reviewer performed the search and a second reviewed the results of the search.

Assessment of study quality
The authors did not report a formal assessment of validity. However, they did report on the use of power calculations, a description of an objective method of assessing the cosmetic outcome, and blinded independent outcome assessment.
Data extraction
It was unclear how many reviewers performed the data extraction. Outcomes data and study conclusions were extracted.

Methods of synthesis
How were the studies combined?
The results of individual studies were tabulated and combined in a narrative.

How were differences between studies investigated?
Differences between the studies were discussed in the text; other differences were apparent from the tables.

Results of the review
Ten studies (n=980) were included: one prospective study (n=111), and seven retrospective chart reviews with control groups (n=780) and two without control groups (n=89).

The studies were of variable quality and only one used a prospective design. None of the studies reported a power calculation or reported confidence intervals when detailing the significance of the results. Five studies described an objective method of assessing the cosmetic outcome and four of these reported blinded independent outcome assessment.

Four studies compared radiotherapy before (three studies) or after (one study) breast reconstruction with no radiotherapy. Three studies reported increased complication rates with radiotherapy, while one study reported similar complication rates in both groups. The limited sample size meant that these results should be interpreted with caution.

Three studies compared the outcomes of patients with radiotherapy before reconstruction with radiotherapy after reconstruction. One study found that TRAM breast reconstruction before or after radiotherapy was associated with satisfactory cosmetic outcome and similar rates of complication. Two studies reported that patients had higher rates of complications immediately post TRAM.

One study did not present separate data for each treatment group but reported that reconstruction after radiotherapy may improve the outcome. Two studies did not have a control group or comparison group.

Authors’ conclusions
Limited evidence suggests that delaying breast reconstruction until after radiotherapy appears to be the safer alternative in most cases. These findings should be interpreted with great caution before generalising from the results.

CRD commentary
The review addressed a clear question that was defined in terms of the participants, interventions and outcomes. The inclusion criteria for study design were broad; this was appropriate given the limited evidence and allowed for a more comprehensive overview of the available evidence. Several relevant databases were searched but no explicit attempt was made to locate unpublished studies. In addition, it was unclear whether any language restrictions were applied. Consequently, the possibility of missing relevant studies could not be adequately assessed. Since details of those involved in the review process were unclear, it was not possible to assess the potential for reviewer error and bias in the data extraction or study selection processes. The criteria used to assess validity were not reported clearly and although some aspects of validity were discussed, this was not comprehensive. However, this may have limited impact on the review given that much of the evidence was derived from retrospective observational studies.

The narrative synthesis was appropriate given the methodological and clinical diversity of the studies. The authors’ cautious conclusions correctly reflect the limited evidence from predominantly retrospective studies, which are unable to provide robust evidence.
Implications of the review for practice and research

Practice: The authors stated that women in whom radiotherapy is considered appropriate should be advised about radiotherapy in relation to the timing and type of reconstruction. Patients who may require post-operative radiotherapy should be advised about the potential need for multiple revisions of breast reconstruction and additional flaps.

Research: The authors stated that there is a need for well-designed multicentre randomised studies that evaluate more objective outcomes independently before definitive recommendations can be made.

Bibliographic details

Indexing Status
Subject indexing assigned by NLM

MeSH
Adult; Breast Neoplasms /radiotherapy /surgery; Esthetics; Female; Mammaplasty /methods; Mastectomy; Middle Aged; Radiotherapy, Adjuvant /adverse effects /methods; Research Design; Surgical Flaps; Time Factors

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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.