

Preserving life and conserving the breast

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For most of the 20th century, the standard treatment for breast cancer was Halsted mastectomy. This was often curative, but by any standards was mutilating: removing the entire breast, the pectoralis major and minor muscles, a good deal of skin, and the axillary lymph nodes. The 5-year results of the Milan I trial, published in 1981,¹ provided the first strong scientific evidence that breast-conserving surgery followed by radiotherapy to the operated breast is equivalent to mastectomy as treatment for early breast cancer (less than 2 cm in diameter). 4 years later Fisher and colleagues² published the 5-year results of their landmark trial on 1843 patients, 1257 of whom initially received breast-conserving surgery. The trial showed that breast conservation is suitable treatment for women with breast cancer up to 4 cm in diameter.

The Fisher trial had three groups: total mastectomy, segmental mastectomy (now known as lumpectomy) with radiotherapy, and segmental mastectomy without radiotherapy. After 5 years, distant disease-free survival and overall survival were no worse in the segmental mastectomy groups than the total mastectomy group (in fact, overall survival was slightly better [$p=0.06$] in the conservation groups). However disease recurrence in the operated breast was significantly more frequent in the lumpectomy group without radiotherapy (27.9%) than the lumpectomy group with radiotherapy (7.7%). And when the conservatively treated patients were categorised according to age, lymph-node status, tumour size, and tumour location, for each category, disease recurrence was always less in patients given radiotherapy, clearly indicating the value of irradiation in reducing recurrence.

As regards cosmetic outcomes, Fisher and colleagues noted that a curvilinear incision, minimum skin removal, no re-approximation of tissue, and lack of drainage all contributed to a good post-operative appearance of the breast. In fact, it is relatively easy to obtain a good cosmetic outcome with lumpectomy, which removes just enough tissue to provide a good chance that the margins of the resected specimen are tumour-free. However, lumpectomy—widely used today in the USA—is problematic. In the Fisher study, 10% of patients initially given lumpectomy had tumour on the margins of the surgical specimen, and for this reason their conservative operation was converted into total mastectomy. By contrast, the more ample quadrantectomy has a greater probability of removing all macroscopic disease foci, but still affords an acceptable cosmetic result.³ Even with radiotherapy, local recurrence rates are consistently lower in patients who receive quadrantectomy than those given lumpectomy.⁴

One could ask whether this matters: patients who recur can be re-treated with no adverse effect on survival. Well it does matter. The psychological effect of disease recurrence on affected women can be devastating. And re-operation (almost always total mastectomy) is expensive. It is here that quadrantectomy plus radiotherapy shows its superiority.

Nevertheless, the importance of the Fisher study must not be underestimated. Together with the Milan studies, it established breast conservation as the norm. Thanks to these studies many women with breast cancer receive surgery each year that preserves their breast and has an excellent probability of being curative.

Conflicts of interest

The authors declared no conflicts of interest.

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Key findings of the 1985 paper by Fisher and colleagues

- The trial began in 1976, recruiting women with stage I and II breast cancer up to 4 cm in diameter. All patients had axillary dissection, and those with positive nodes received chemotherapy
- By life-table estimates, segmental mastectomy (lumpectomy), with or without breast irradiation, resulted in disease-free, distant disease-free, and overall survival at 5 years no worse than that after total breast removal
- 92.3% of women given radiation were disease-free at 5 years, compared with 72.1% of conservatively treated women not irradiated ($p<0.001$)
- These findings were confirmed at 20-year follow-up⁵ and show that breast-conservation surgery followed by breast irradiation is appropriate treatment for stage I–II breast cancers up to 4 cm in diameter

