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Margin width influencing local recurrence in ductal carcinoma in situ

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Introduction

Ductal carcinoma in situ (DCIS) is a non-invasive carcinoma that is unlikely to recur if completely excised. Margin width, the distance between the boundary of the lesion and the edge of the excised specimen, may be an important determinant of local recurrence. Preventing local recurrence is important because about one half of such recurrences are invasive cancers with the potential to metastasize. Radiation therapy after local excision has also been shown to reduce the local recurrence rate, however this may not be necessary for all in situ carcinoma subgroups.

Aims

The aim was to investigate whether the margin width of tumors could predict the likelihood of local recurrence in patients who did or did not receive postoperative radiation therapy and whether a subgroup of patients could be identified with such a low risk of local recurrence that postoperative radiation therapy is not needed.

Comments

This study confirms that ductal carcinoma in situ may be curable by local excision and that in most cases there is no need to treat the entire breast by irradiation. The status of the excision margins is probably the most important factor in determining local recurrence. If wide margins can be achieved then the need for adjuvant therapy becomes questionable. However, ductal carcinoma in situ is a heterogeneous disorder and a blanket approach to therapy can be overly simplistic. Indeed smaller, circumscribed lesions may require only minimal margins whilst for larger lesions it may be difficult to perform breast conserving treatment whilst maintaining wide margins.

Methods

Margin widths, determined by direct measurement or ocular micrometry, and standardized evaluation of the tumor for nuclear grade, comedonecrosis, and size were performed on 469 specimens of ductal carcinoma in situ from patients who had been treated with breast conserving surgery with or without postoperative radiation therapy, according to the choice of the patient or her physician. Treatment was not randomized and the study was retrospective.

Results

Of the 469 patients, 213 also received postoperative radiation therapy. There were 75 local recurrences, 38 in patients who underwent excision only and 37 in patients treated with excision plus postoperative radiation therapy. The mean follow-up was 81 months. Only 3 of 133 patients with margins 10 mm wide or wider had a local recurrence, and there was no reduction in the probability of local recurrence with the addition of postoperative radiation therapy (relative risk 1.14, $P = 0.92$). The mean estimated probability of recurrence at 8 years was 0.04. Among patients with a margin of 1 to <10 mm, of the 124 who received no radiation therapy and the 100 who received radiation therapy, 23 and 15 respectively, developed a local recurrence (relative risk 1.49, $P = 0.24$). In contrast, in patients with a margin of less than 1 mm, of the 39 who received no radiation therapy and the 73 who received radiation therapy, 13 and 21, respectively, developed a local recurrence (relative risk 2.54, $P = 0.01$). The relative risks of recurrence did not change substantially after adjustments for tumor size, nuclear grade and the presence or absence of comedonecrosis.

Discussion

The probability of local recurrence is low if the margins are wide and the incidence of local recurrence is not reduced by the addition of radiation therapy. With margins of 1 to <10 mm, the difference between excision only and excision plus radiation therapy is not significant. With margins narrower than 1 mm, there is a significant decrease in the probability of local recurrence when radiation therapy is added. The margin width thus appears to be an excellent predictor of local recurrence and the likelihood of residual ductal carcinoma in situ, and could possibly be used as the sole determinant of the need for postoperative radiation therapy. However, the evaluation of margin widths requires complete tissue processing. Without complete tissue processing, margins and invasive foci may go unrecognized. Standardized methods of margin evaluation must be developed and prospectively tested.

References

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