

## Prediction of nipple and areola involvement in breast cancer

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**Aims.** To find a pre-operative test for nipple and areola involvement in breast cancer.

**Methods.** Areola–tumour distance was measured in 140 consecutive patients (median age 45, range: 23–83) undergoing a mastectomy. We analysed whether nipple and areola correlated with areola–tumour distance, tumour size, nodal status, perinodal involvement and lymphatic embolization.

**Results.** The nipple was involved in 22 (16%) cases and this correlated with tumour size, number of lymph nodes, perinodal extension and presence of lymphatic emboli. In all these 22 cases, the tumour was within 2.5 cm of the areola. Tumour size, however, could not predict nipple involvement in tumours within 2.5 cm of the areolar edge.

**Conclusions.** In the one-fifth of cases where the tumour is over 2.5 cm from the areola, preserving the nipple and areola for reconstruction may be worthwhile. In remaining cases, some other predictive test for nipple involvement would be necessary.

**Key words:** nipple–areola complex; involvement; breast cancer; breast reconstruction.

### Introduction

The nipple–areola complex has, traditionally, been excised in a modified radical mastectomy. However, it has now been proved conclusively that survival after lesser surgery is comparable to that after more radical surgery,<sup>1,2</sup> and the cosmetic effect following surgery has gained importance today. When a woman is not suitable for conservative surgery, immediate reconstruction of the breast is usually offered. At such time, a preserved nipple and areola would enhance the ultimate cosmetic result, therefore, it becomes imperative to know pre-operatively whether the nipple is involved with the cancer.

Many earlier studies have addressed this problem. Smith *et al.*<sup>3</sup> found that there was an increased chance of pathological nipple involvement if it was clinically involved and/or the primary tumour was  $\geq 2$  cm or retroareolar. Parry *et al.*<sup>4</sup> found that 14/16 involved nipples in their study were either ulcerated, retracted or attached to an underlying mass. These studies<sup>3,4</sup> and the one by Fisher *et al.*<sup>5</sup> were retrospective in nature and have found the nipple to be involved in 12.2%, 8% and 11.1%, respectively. When a more detailed pathological examination is carried out in prospective studies, the incidence of nipple involvement is higher. Anderson and Pallesen<sup>6</sup> found that the nipple and/or areola were involved in 50% of 40 breasts studied and

that the criteria described earlier would have missed one-third of these cases. Lagios *et al.*<sup>7</sup> found that 30.2% of nipples in their detailed study were involved. Although they found that clinical nipple involvement, tumour size and grade were predictors of nipple involvement, the best predictor of involvement was proximity of tumour to the nipple; 95% of involved nipples had the primary tumour within 2.5 cm of the nipple edge.

We carried out a prospective study with the intention of finding a pre-operative test for nipple and areola involvement.

### Method

One hundred and forty consecutive patients who underwent modified radical mastectomy at Tata Memorial Hospital were included in the study. In each patient, distance from the edge of the areola to the edge of the tumour was measured pre-operatively. After mastectomy the nipple and areola were studied by taking six to eight vertical sections so that the entire nipple–areola complex with the underlying tissues was included. Involvement of nipple and areola was correlated with the areola–tumour distance, tumour size, nodal status, perinodal involvement and lymphatic embolization.

### Results

The median age of the 140 patients was 45 years (range: 23–83). The nipple was involved in 22 (16%) cases.

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Involvement of nipple correlated with tumour size ( $P=0.00001$ ), number of lymph nodes ( $P=0.03$ ), perinodal extension ( $P=0.0002$ ) and presence of lymphatic emboli ( $P=0.0006$ ). The areola-tumour distance was a significant predictor of nipple involvement. The nipple was involved in 22 (20%) of 109 cases in which the tumour was less than 2.5 cm away from areola; whereas it was involved in none of the 31 cases in which the tumour was beyond 2.5 cm from the areolar edge ( $P=0.002$ ). We found that tumour size could not predict nipple involvement in tumours within 2.5 cm of the areolar edge.

### Discussion

The results of this small study indicate that the nipple is unlikely to be involved if the distance between the tumour edge and areola is more than 2.5 cm. We might have found a lower incidence of nipple involvement because we did not use a correlated radiological-pathological method as used by Lagios *et al.*<sup>7</sup> Nevertheless, the results are similar with respect to the distance from nipple being a predictor of its involvement. In patients with tumours more than 2.5 cm away from the areola, it may be worthwhile to preserve the nipple and areola if a reconstruction is planned. It must be noted that such cases formed about one-fifth of all cases

and some other predictive test for nipple involvement would be needed for the remaining cases.

### References

1. Fisher B, Anderson S, Redmond CK, Wolmark N, Wickerham DL, Cronin WM. Reanalysis and results after 12 years of follow-up in a randomized clinical trial comparing total mastectomy with lumpectomy with or without irradiation in the treatment of breast cancer. *N Engl J Med* 1995; **333**: 1456-61.
2. Early Breast Cancer Trialists' Collaborative Group. Effects of radiotherapy and surgery in early breast cancer: an overview of the randomized trials. *N Engl J Med* 1995; **333**: 1444-55.
3. Smith J, Payne WS, Carney JA. Involvement of the nipple and areola in carcinoma of the breast. *Surg Gynecol Obstet* 1976; **143**: 546-8.
4. Parry RG, Cochran TC, Wolford FG. When is there nipple involvement in carcinoma of the breast? *Plast Reconstr Surg* 1977; **59**: 535-7.
5. Fisher ER, Remigio M, Gregorio MD, *et al.* The pathology of breast cancer. A syllabus derived from finding of the National surgical adjuvant breast project (Protocol no. 4). *Cancer* 1975; **36**: 1.
6. Anderson JA, Pallesen RM. Spread to the nipple and areola in carcinoma of breast. *Ann Surg* 1979; **189**: 367-72.
7. Lagios MD, Gates EA, Westdahl PR, Richards V, Alpert BS. A guide to the frequency of nipple involvement in breast cancer: a study of 149 consecutive mastectomies using a serial subgross and correlated radiographic technique. *Am J Surg* 1979; **138**: 135-42.

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