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ORIGINAL ARTICLE

Post mastectomy radiotherapy in breast cancer: a survey of current United Kingdom practice

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Summary

Purpose: *Radiotherapy (RT) is increasingly used following mastectomy for breast cancer. While indications for post-mastectomy radiotherapy (PMRT) are clear in patient groups at high risk of local recurrence, guidelines are less clear in intermediate-risk patients and patients with ductal carcinoma in situ (DCIS). This study aimed to determine variations in the use of PMRT in the United Kingdom (UK).*

Methods: *A postal survey of all consultant breast surgeon members of the Association of Breast Surgery in the UK.*

Results: *Tumour size and nodal status were confirmed as the most important indications for PMRT. There was significant variation in the influence of other factors such as tumour grade, lymphovascular invasion and margin status. Nineteen per cent of respondents stated that they would consider the use of PMRT in cases of DCIS alone.*

Conclusions: *There is significant variation in practice across the UK with regard to the use of PMRT in intermediate risk breast cancer and patients with DCIS. Further work is required to determine which patients in these groups are likely to benefit from the use of PMRT.*

Key words: breast cancer, mastectomy, radiotherapy

Introduction

RT is an increasingly employed treatment modality following mastectomy for breast cancer. It has been demonstrated that PMRT can reduce local recurrence rates following mastectomy and axillary node clearance [1,2]. Overview analysis of PMRT in breast cancer has suggested benefits in terms of both local disease control and overall breast cancer mortality for both node-negative and node-positive patients, although the absolute benefit was greater in node-positive patients with a higher risk of disease recurrence [3]. Current National Institute for Health and Clinical Excellence guidelines in the UK recommend the use of PMRT in patients at high risk of local recurrence following surgery –those with 4 or more positive axillary lymph nodes, or those with involved resection margins [4]. European guidelines similarly support the use of PMRT in such high risk patients [5].

The benefit of PMRT in intermediate risk patients is less clear. Some authors have suggested that the survival benefit from PMRT is seen in patients with 1-3 positive axillary nodes [6], and this is borne out by the EBCTCG overview analysis [3]. This remains the subject of an ongoing study in the SUPREMO trial [7]. There is little supporting evidence for the use of PMRT in DCIS, although it has been suggested that it should be employed in patients with close or involved resection margins [8]. More recent data has not supported the use of RT in any subset of patients following mastectomy for DCIS [9].

The likely requirement for PMRT is an important consideration in patients who are contemplating immediate breast reconstruction following mastectomy for breast cancer. It has been suggested that RT can increase the complication rate in implant-based reconstruction, including an increased rate of capsular contracture [10]. In addition, increased rates of fat necrosis and flap volume loss have been reported following RT after autologous tissue reconstruction [11]. The rate of immediate breast reconstruction in the United Kingdom was reported as 21% in the second annual report from the National Mastectomy and Breast Reconstruction Audit [12], and therefore it can be seen that the requirement

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or otherwise for PMRT is likely to impact on significant numbers of women.

Given the lack of clear data to support the use of PMRT in moderate risk invasive breast cancer, and the absence of guidelines to support PMRT in women with DCIS, it seems reasonable to assume that there exists variation in practice across the UK with respect to this treatment modality. This study aimed to examine the use of PMRT in invasive and in situ disease in UK practice, and to investigate those factors considered indications for the use of PMRT.

Methods

A questionnaire (Table 1) was posted to all consultant breast surgeons who were members of the Association of Breast Surgery in England, Scotland and Wales. Respondents were asked about indications for PMRT in their practice, and specifically their use of PMRT following mastectomy for DCIS. The questionnaire also sought to establish the existence of unit guidelines or protocols for the use of PMRT and the extent of participation in the SUPREMO trial.

Statistical considerations

Data was collected and stored on a Microsoft Excel (2010) spreadsheet. All calculations (addition, subtraction, percentage calculations) were carried out using Microsoft Excel.

Results

From 480 questionnaires posted, 226 were returned - a response rate of 47%. Of 226 respondents, 211 (93%) reported a unit protocol for PMRT and 178 (79%) indicated participation in the SUPREMO trial.

Potential indications for RT in invasive disease, together with the number of respondents taking these into consideration were reported in Figure 1. Nodal involvement (94%) and tumour size (94%) were the most commonly cited indications, followed by deep margin clearance (71%). Where respondents stated that deep resection margin post-mastectomy was an indication for RT, they were asked to quantify what was considered an acceptable deep margin. This information is summarised in Figure 2. The majority (73%) would consider and involved margin or margin of less than 1 mm to be an indication for PMRT, with only 22% seeking a margin greater than 2 mm and 4% considering 5 mm or more to be a satisfactory margin. Proximity to margins other than the deep margin was only considered an indication for RT by 30% of respondents.

Respondents were also asked whether superficial margin status influenced a decision to prescribe PMRT following skin-sparing mastectomy for invasive breast cancer. In total 139 of 226 (62%) of respondents stated that superficial margin status did not influence radio-

Table 1. Questionnaire posted to ABS members in England, Scotland and Wales MDT/Hospital

1. Does your unit have a protocol or guidelines for post mastectomy radiotherapy in invasive breast cancer?
   Yes ☐
   No ☐
2. Is your unit participating in the SUPREMO trial?
   Yes ☐
   No ☐
3. Which of the following factors influence the decision to give post-mastectomy radiotherapy in invasive disease (please tick all that apply)?
   LVI ☐
   Tumour size ☐
   Tumour grade ☐
   Extent of in-situ component ☐
   Deep margin ☐
   Other margin ☐
   Nodal status ☐
4. If deep margin influences radiotherapy treatment then what deep margin is considered an indication for radiotherapy?
   <1 mm ☐
   <2 mm ☐
   <5 mm ☐
   <10 mm ☐
5. Does superficial margin status influence a decision to treat with post-operative radiotherapy following skin-sparing mastectomy and reconstruction for invasive disease?
   Yes ☐
   No ☐
6. Does your MDT ever recommend radiotherapy post-mastectomy for pure DCIS (without an invasive or micro-invasive component)?
   Yes ☐
   No ☐
7. If yes, does deep margin status influence the decision to treat?
   Yes ☐
   No ☐
8. If deep margin influences radiotherapy treatment then what deep margin is considered an indication for radiotherapy?
   <1 mm ☐
   <2 mm ☐
   <5 mm ☐
   <10 mm ☐
9. Does superficial margin status influence a decision to treat with post-operative radiotherapy following skin-sparing mastectomy and reconstruction for DCIS?
   Yes ☐
   No ☐
10. If yes, what superficial margin is considered adequate?
    <1 mm ☐
    <2 mm ☐
    <5 mm ☐
    <10 mm ☐

Do you have any further comments regarding the use of post-mastectomy therapy in your unit

Many thanks for taking the time to complete this questionnaire

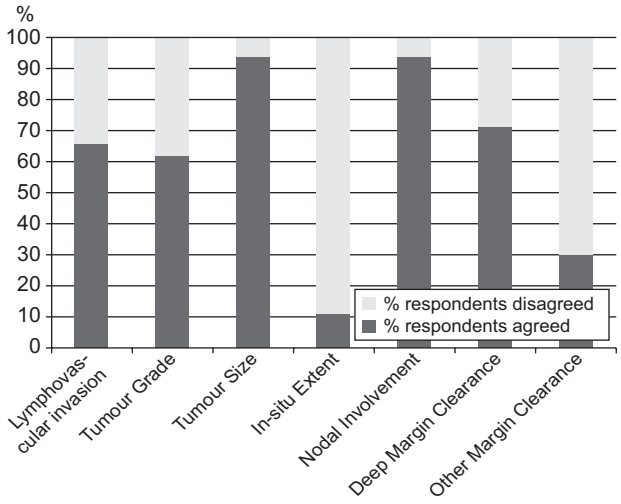

Figure 1. Indications for post-mastectomy radiotherapy for invasive disease.

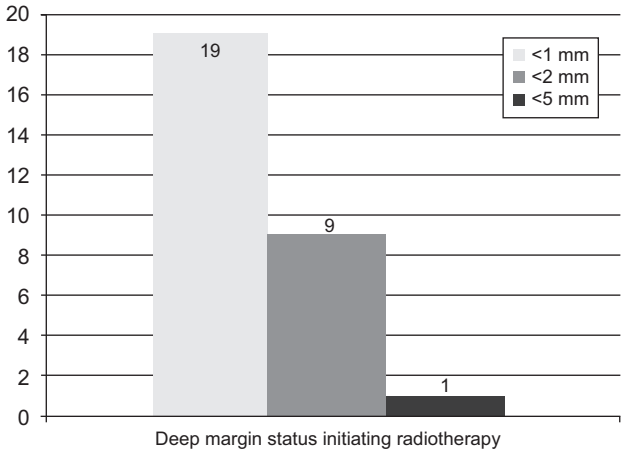

Figure 3. Deep margin status initiating radiotherapy following mastectomy for DCIS alone.

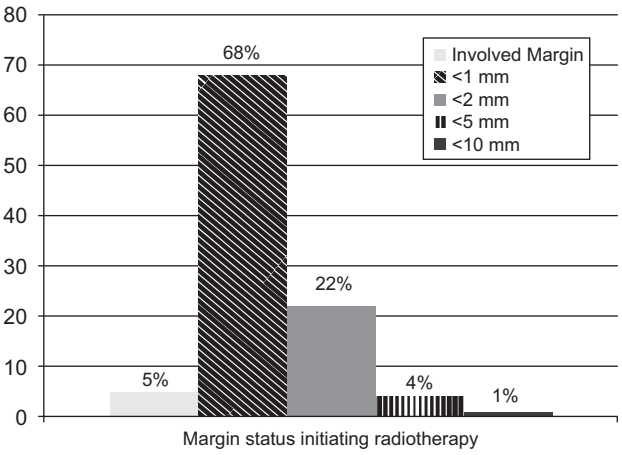

Figure 2. Deep margin triggering use of post-mastectomy radiotherapy in invasive breast cancer.

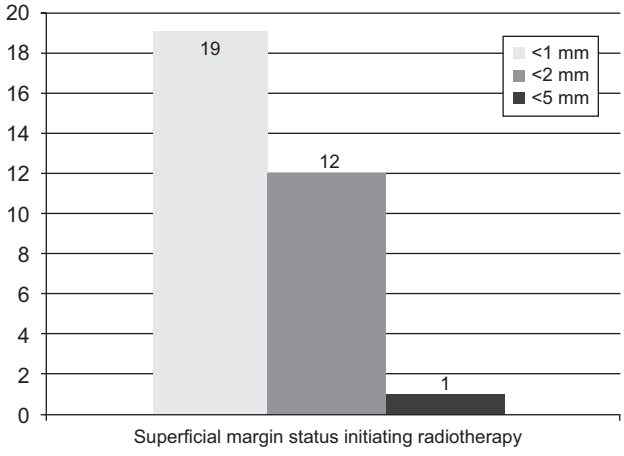

Figure 4. Superficial margin status as an indication for PMRT following skin-sparing mastectomy for DCIS.

therapy following skin-sparing mastectomy for invasive disease.

Nineteen per cent of respondents stated that they would consider the use of PMRT in pure DCIS, in the absence of invasive disease. Of the 42 surgeons in this group, 29 (69%) stated that deep margin clearance was a factor influencing RT treatment. Of those 29 surgeons, the majority (19) would consider PMRT for a margin less than 1 mm, with 9 surgeons looking for a margin of 2 mm or greater, and 1 respondent requiring 5 mm; these results are summarised in Figure 3. Respondents were also asked to comment on superficial margin status as an indication for PMRT for DCIS alone. Thirty-two (14%) said that superficial margin status was an indication for RT following skin-sparing mastectomy for DCIS, and the margin clearance indicating RT for these respondents is summarised in Figure 4. As with the deep margin, the majority (19) required a superficial margin of greater than 1 mm to avoid RT, with 12 surgeons requiring a margin of 2 mm or more, and 1 surgeon requiring a margin in excess of 5 mm.

Discussion

The role of PMRT is generally accepted in patients with a high risk of local recurrence. NICE guideline in the UK support the use of PMRT for patients with 4 or more involved axillary lymph nodes [4]. The American Society of Clinical Oncology (ASCO) guidelines recommended PMRT for T3 tumours [13], as do ESMO guidelines [5]. The majority of respondents (94%) in our study cited nodal involvement and tumour size as an indication for PMRT therefore agreeing with pub-

lished guidelines. Other factors reflecting tumour biology, such as tumour grade and presence of lymphovascular invasion were, however, much less influential in the decision-making process, reflecting the lack of consensus among international steering groups such as ASCO. Deep margin status was considered important by 71% of respondents, reflecting findings from the Danish 82-C trial that benefit from PMRT was found in tumours invading the pectoral fascia [1]. There was however variation among respondents regarding the degree of margin clearance required to obviate the need for radiotherapy. A 2009 meta-analysis of 22 studies incorporating over 18000 patients suggested that a close resection margin was associated with an increased risk of local recurrence, and that PMRT should be considered in this group [14]. This review suggested that a 5 mm margin should be considered close but the author acknowledged that further data is required to support this. It is encouraging to see that the majority of units are taking part in the SUPREMO trial, to provide evidence for the role of PMRT in intermediate risk patients.

Currently there is little evidence supporting the use of PMRT in patients with DCIS, although there is some conflicting data on this topic [8,9]. This survey bears out the fact that this is a controversial topic, with no real consensus apparent amongst respondents. It does however demonstrate that a significant minority (19%) would consider the use of RT after mastectomy for DCIS alone. Given that local recurrence rates following mastectomy for DCIS are low, with reported 10-year disease free survival of up to 98% [15], additional benefit to be gained from the RT seems likely to be small. Further work is required to determine whether there are any sub-groups of patients at increased risk of recurrence following mastectomy for DCIS, and whether PMRT may be beneficial in these groups.

Clearly there are limitations to this study. The response rate is incomplete at 47%, which may introduce an element of bias. In addition, the questionnaire was sent to breast surgeons, and it is possibly that there is a discrepancy between what surgeons perceive to be the recommendations of the multidisciplinary team, and treatment actually offered by clinical oncologists. Despite these limitations, it is apparent that there is considerable variation in practice across the UK with regard to PMRT practice. It is clear that further evidence is needed to determine best practice and to provide a substantive evidence base for guideline development.

References

1. Overgaard M, Hansen PS, Overgaard J et al. Postoperative radiotherapy in high-risk premenopausal women with breast cancer who receive adjuvant chemotherapy. N Engl J Med 1997; 337: 949-955.
2. Ragaz J, Olivotto IA, Phillips N et al. Locoregional radiation therapy in patients with high-risk breast cancer receiving adjuvant chemotherapy: 20 year results of the British Columbia Randomized Trial. J Natl Cancer Inst 2005; 97: 116-126.
3. Early Breast Cancer Trialists' Collaborative Group (EBCTCG); Darby S, McGale P [3RD AUTHOR] et al. Effect of radiotherapy after breast-conserving surgery on 10-year recurrence and 15-year breast cancer death: meta-analysis of individual patient data for 10 801 women in 17 randomised trials. Lancet 2011; 378: 1707-1716.
4. www.nice.org.uk/nicemedia/pdf/CG80NICEGuideline.pdf
5. Aebi S, Davidson T, Gruber G, Cardoso F; ESMO Guidelines Working Group. Primary breast cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol 2011; 22 (Suppl 6): vi 12-24.
6. Overgaard M, Nielsen HM, Overgaard J. Is the benefit of postmastectomy irradiation limited to patients with four or more positive nodes, as recommended in international consensus reports? A subgroup analysis of the DBCG 82 b&c randomized trials. Radiother Oncol 2007; 82: 247-253.
7. www.ncri.org.uk/ncriconference/abstract/pdf/.../NCRI2006_0477.pdf
8. Rashtian A, Iganej S, Amy Liu IL, Natarajan S. Close or Positive Margins After Mastectomy for DCIS: Pattern of Relapse and Potential Indications for Radiotherapy. Int J Radiat Oncol Biol Phys 2008; 72: 1016-1020.
9. Chan LW, Rabban J, Hwang ES. Is radiation indicated in patients with ductal carcinoma in situ and close or positive mastectomy margins? Int J Radiat Oncol Biol Phys 2011; 80: 25-30.
10. Ascherman JA, Hanasono MM, Newman MI, Hughes DB. Implant Reconstruction in Breast Cancer Patients Treated with Radiation Therapy. Plast Reconstr Surg 2006; 117: 359-365.
11. Taylor CW, Horgan K, Dodwell D. Oncological aspects of breast reconstruction. Breast 2005; 14: 118-130.
12. www.ic.nhs.uk/mbr
13. Recht A, Edge SB, Solin LJ et al. Postmastectomy Radiotherapy: Clinical Practice Guidelines of the American Society of Clinical Oncology. J Clin Oncol 2001; 19: 1539-1569.
14. Rowell NP. Radiotherapy to the chest wall following mastectomy for node-negative breast cancer: a systematic review. Radiother Oncol 2009; 91: 23-32.
15. Silverstein MJ, Barth A, Poller DN et al. Ten year results comparing mastectomy to excision and radiation therapy for ductal carcinoma in situ of the breast. Eur J Cancer 1995; 31A: 1425-1427.