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Is There a Role of Adjuvant Irradiation for Patientswith Ductal Carcinoma in Situ (DCIS) Undergoing Breast Conserving Surgery (BCS)?

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Abbreviations: DCIS: Ductal Carcinoma in Situ; RT: Radiation Therapy; BCS: Breast Conserving Surgery

Abstract

Ductal Carcinoma in Situ (DCIS) of the breast constitutes a noninvasive malignancy without invasion of the base mentmembr anehistologically, and accounts for approximatelyone-fifth of the total newly diagnosed breast cancers as a rapidly growing subgroup including prolife rative lesions with varying malignant potential. DCIS is being more increasingly diagnosed thanks to improvements in screening and public awareness. Management of DCIS includes several controversies particularly focusing on the utility of irradiation. Stratification of patients into risk groups in an effort to identify those at a higher risk of local recurrence after surgery is a widely accepted consideration. Sparing of at least a subgroup of patients deemed to be at a relatively lower risk of recurrence mayassist in avoiding over treatment with radiation therapy (RT). This is partly due to adverse effects of irradiation. Despite availability of normal tissues paring irradiation technologies including adaptive RT and breathing adapted RT, there are concerns on theuse of irradiation at least for some patients with DCIS.

At least 4 randomized trials and 2 meta analyses have substantiated the utility of RT following breast conserving surgery (BCS) for DCIS. Utility of adjuvant RT after BCS is supported by high level evidence including randomized trials and meta analyses. There is ongoing re search for identification of a sub group of patients with favorable characteristics and low risk of recurrence to considero mission of RT. Advances in technology and radiation delivery allow for more refined and normal tissues paring treatments to achieve an improved toxicity profile for patients receiving RT. Improved imaging and screening techniques mayaid in detection of more patients with favorable characteristics in whom observation may be considered. Nevertheless, most patients with DCIS are likely to receive adjuvant RT in light of the available evidence. Herein, wefocus on the role of adjuvant irradiation in DCIS patients under going breast conserving surgery (BCS).

Introduction

Ductal Carcinoma in Situ (DCIS) of the breast constitutes a non invasive malignancy without invasion of the basement membran ehistologically, and accounts for approximatelyone-fifth of the total newly diagnosed breast cancersas a rapidly growing subgroup including proliferativelesions with varying malignant potential [1-4]. Management of DCIS includes several controversies particularly focusing on theutility of irradiation [3-19]. Stratification of patients into risk groups in an effort to identify those at a higher risk of local recurrence after surgery is a widely accepted consideration. Sparing of at least a subgroup of patients deemed to be at a relatively lower risk of recurrence may assist in avoiding over treatment with radiation therapy (RT). This is partly due to adverse effects of irradiation. Despite availability of normal tissues paring irradiation technologies including adaptive RT and breathing adapted RT, there are concerns on theuse of irradiation at least for some patients with DCIS [20-28]. Here in, we focus on the role of adjuvant irradiation in DCIS patients under going breast conserving surgery (BCS).

Role of Adjuvant Irradiation in DCIS Patients Undergoing BCS

While a considerable proportion of patients particularly including those with extensive or multicentric DCI Sundergom astectomy, BCS is the more commonly utilized surgical approach for DCIS management [29]. At least 4 randomized trials and 2 metaanalyses have substantiated the utility of RT following BCS for DCIS [4,5,30-33]. The randomized Swe DCIS trial included 1046 patients who were randomly assigned to RT versusno RT after BCS [29]. Use of adjuvant RT resulted in an absolute risk reduction of 12% at 20 years with a relative risk reduction of 37.5% [30]. EORTC 10853 randomized phase III trialrandomlyassigned 1010 patients with DCIS undergoing local excision to either no further treatment or RT [31]. At a median follow up of 15.8 years, RT decreased the risk of any local recurrence by 48% [31]. RT increased the 15 year local recurrence free rate from 69% to 82% and decreased the overall salvagemastectomy rate after local recurrence [31]. The authors concluded that almost one third of patients undergoing local excision for DCIS suffered from local recurrence at 15 years, and RT reduced this risk by a factor of 2 which may be considered as a robust justification for use of RT in this patient group [31].

Assessment of longterm outcomes of invasive ipsilateral breast tumor recurrences after lumpectomy in the NSABP B-17 and NSABP B-24 randomized clinical trials for DCIS revealed that incorporation of RT decreased invasiveips ilateral breast recurrences by 52% compared to lumpectomy alone [32]. Longterm results of UK-ANZ DCIS trial evaluating the effect of tamoxifen and RT in patients with DCIS undergoing local excision revealed that RT decreased the incidence of all newbreast events with reduction in incidence of ipsilateral invasive disease and ipsilateral DCIS [33]. A metaanalysis of randomized trials assessing the utility of RT after BCS for DCIS management revealed that addition of RT to BCS yielded an approximately 60% decrease in breast Care currence [4]. Patients with high grade DCIS and involved margins had greater benefit from incorporation of RT in management [4]. The authors concluded that RT should be suggested after lumpectomy for all DCIS patients having no conraindications considering the available evidence [4]. A more recent metaanalysis of randomized controlled trials evaluating adjuvant RT versus observation after BCS in DCIS revealed thataddition of RT reduced ipsilateral breast and regional recurrences by almost half, suggesting a n integral role for adjuvant RT in DCIS management [5].

Conclusions and Future Perspectives

Considerable advances have been introduced in the discipline of radiation oncology in the millen niumer a including state of the art RT technologies including Image Guided Radiation Therapy, Intensity Modulated Radiation Therapy, and radio surgical platforms for focus edir radiation intracranial targets withim proved accuracy and precision [34-70]. In the context of breast neo plasms, DCIS is being more increasingly diagnosed thanks to improvements in screening and public awareness. Utility of adjuvant RT after BCS is supported by highlevel evidence including randomized trials and metaanalyses. There is ongoing research for identification of a subgroup of patients with favorable characteristics and low risk of recurrence to considero mission of RT. Advances in technology and radiation delivery allow for more refined and normal tissues paring treatments to achieve an improved toxicity profile for patient sreceiving RT. Improved imaging and screening techniques may aid in detection of more patients with favorable characteristics in whom observation may be considered. Nevertheless, most patients with DCIS are likely to receive adjuvant RT in light of the available evidence.

Confict of Interest

There are no conflicts of interest.

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