

Surgical management of lobular carcinoma from a national screening program: A retrospective analysis



S.D.J. Sharma^c, M. Barry^{a,b}, E.A. O'Reilly^c, M.R. Kell^{a,b,c,*}

^aBreastcheck, National Cancer Control Program, Ireland

^bMater Misericordiae University Hospital, Ireland

^cUniversity College Dublin, Ireland

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Abstract

Objective: To compare the surgical outcomes of women diagnosed with invasive ductal and lobular carcinoma of the breast.

Background: The role of Breast Conserving Surgery (BCS) for invasive cancers of the breast is well established; however its role for invasive lobular carcinoma is less well defined. Concerns exist regarding the need for re-excision of margins and the eventual need for mastectomy in women with Invasive Lobular Carcinoma (ILC) compared with Ductal Carcinoma (IDC). In this study we compare the surgical results of these two groups examining BCS from a national breast cancer screening program.

Methods: Analysis of mammographically detected ILC and IDC tumours obtained from the national breast cancer screening program of the Republic of Ireland (BreastCheck) was performed. BreastCheck offers biannual screening mammograms to women throughout the Republic of Ireland between 50 and 65 years of age. We examined and pooled the data across 4 screening zones from 2005 to 2010.

Conclusions: We observed similar success rates and trends in both the ILC and IDC groups where BCS was attempted. Patients selected for BCS with ILC were statistically more likely to have successful surgery compared with IDC as tumour size increased. There however was no statistical difference in a pooled analysis of successful treatment across all tumour sizes in comparing the two groups. We conclude that BCS is an appropriate and acceptable treatment option for women diagnosed with ILC.

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Keywords: Breast Conserving Surgery; Invasive lobular carcinoma; Invasive ductal carcinoma; Surgical oncology; Re-excision of margins

Introduction

Breast Conserving Therapy (BCT) consists of the wide local excision of the tumour with negative margins followed by irradiation to the breast. Breast Conserving Surgery (BCS) has been the prevailing treatment of Invasive Breast Cancer (IBC) since a series of randomised control trials with long term follow up showed unequivocally that it is as effective as mastectomy.^{1–5} Since these trials commenced, changes in radiological detection,

chemotherapeutics and radiation therapy have further improved rates of local recurrence and overall survival.

There still persists an apprehension towards treating Invasive Lobular Carcinoma (ILC) with BCS, despite excellent results with patients treated with BCS diagnosed with Ductal Carcinoma (IDC).^{6,7} A possible explanation for this is that ILC presents as a more pervasive tumour type when compared to its Ductal counterpart.^{6,8–10} A scattered growth pattern, and tendency towards multifocality makes ILC more difficult to detect on clinical examination and mammography,¹¹ and may underestimate the true pathological size of the tumour.¹² Patient preference is another factor, as some women may opt to avoid radiation therapy or may not be eligible.

By definition the goal of BCS is to conserve breast tissue. Therefore the best margin in breast conserving surgery is one where the tumour has been removed and the residual

Abbreviations: BCT, Breast Conserving Therapy; BCS, Breast Conserving Surgery; IBC, Invasive Breast Cancer; ILC, Invasive Lobular Carcinoma; IDC, Invasive Ductal Carcinoma.

* Corresponding author. Breastcheck, National Screening Programme, Mater Misericordiae University Hospital, Dublin 7, Ireland.

E-mail address: malcolm.kell@nbsp.ie (M.R. Kell).

tissue left behind can be best controlled with radiation therapy.¹³ Due to the diffuse nature of ILC, the need to re-excise tissue to obtain adequate tumour free margins may also contribute to hesitancy in the use BCS in the ILC subset of patients. Re-excision rates have been quoted as high 40% in some cases which has led to further surgeries, including mastectomy, as well as extra doses of radiation to positive margin sites.^{14–17} Additional surgery adds to the psychological and emotional stress of already receiving the diagnosis of breast cancer and then having to undergo treatment and having the initial treatment fail. There is an additional burden on the healthcare system as a consequence of protracted surgical care.^{18,19} Besides from the obvious financial costs of having additional surgery, multiple surgeries in a patient will lead to increased waiting times and preclude other patients from receiving their surgery in a timely manner. By adopting an oncoplastic surgical approach, which factors in an aesthetic element to the treatment of breast cancer patients, the psychological impact and how a woman perceives her treatment can all be improved.^{20,21}

The aim of our study was to examine whether ILC patients were more likely to fail BCS compared to their IDC counterparts. We examined the success rates for ILC and IDC across all tumour sizes to see if there was a significant difference in the number of women in whom BCS was attempted and if they went on to require a mastectomy. We also analysed the number of procedures and the size of the tumours in the ILC and IDC groups.

Methods

We performed a data analysis of the National Breast Cancer Screening Program (BreastCheck) of Ireland between the years 2005 and 2010 on women who were diagnosed with either mammographic detected ILC or IDC between the ages of 50–65. A total of 2277 patients were diagnosed with invasive breast cancer through BreastCheck. Mammography was carried out in 4 regional centers and in mobile units across Ireland. Surgery for these women was also carried in 8 hospitals designated as Centers of Excellence for surgical oncology. Women enrolled in the BreastCheck program received biannual mammograms if asymptomatic. Symptomatic women, high risk and women with a family history of breast cancer received separate screening, and were not included in this study. Each patient diagnosed with invasive breast cancer was discussed in a multidisciplinary meeting, in the presence of surgical, radiology, pathology and medical oncologist of each respective institute where a consensus on patient management would be reached and the suitability of BCS would be determined.

Patients were grouped based on the pathologically determined size of the tumour after surgical excision. For convention, in keeping with previously published sources, an excisional biopsy was determined to be a primary

surgical procedure, and together with wide local excisions was together classified as a breast conserving surgical procedures. The endpoint for failed breast conserving surgical treatment was any women who underwent a mastectomy in whom a breast conserving surgery was initially carried out. Invasive tumours were grouped according to the pathological tumour size; T1ab (less than 10 mm), T1c (10–19 mm), T2 (20–49 mm), and T3 (greater than 50 mm). A positive margin was defined as cancerous cells appearing ≤ 2 mm from an inked surface, negative margins were ≥ 2 mm from an inked surface at the time of pathological scoring. All patient data over this time period is collated and then stored in a central screening hub office.

This pooled data from the 4 cancer centres involved were analysed to measure treatment patterns of both ILC and IDC. For treatment patterns of each cancer subtype, the odds ratio (OR) of the simple proportions of events was estimated with its variance and 95% CI. Heterogeneity between the ORs for the same outcome between subtypes was assessed using the χ^2 -based Q statistic.²² Data were then combined across subtypes by the use of general variance methods with fixed and random effects models. Analyses were conducted using StatsDirect version 2.5.6 (StatsDirect Ltd, Cheshire, United Kingdom) and SPSS version 12.0 (SPSS, Inc., Chicago, IL). All statistical tests were two-tailed.

The Kaplan–Meier Analysis was used to determine the successful treatment of each group ductal and lobular tumours.²³ Failed treatment was determined as any patient in whom a breast conserving surgery (i.e. excisional biopsy or wide local excision) was carried out, where eventually mastectomy was required. Failed breast conserving surgery was irrespective of the number of procedures required to gain negative margins or local control. Kaplan–Meier analysis was performed using GraphPad Prism version 5.00 for Windows, GraphPad Software, San Diego California USA. Percent of successful treatment was measured against increasing tumour size and were plotted using the product limit method of Kaplan and Meier. The log-rank (Mantel–Cox) test was used for comparison of the two curves generated. All *P*-values were all two-sided tests and values less than or equal to 0.05 were considered to be statistically significant.

Results

In total 2277 patients were treated after diagnosis with mammographically screened detected invasive lobular or invasive ductal carcinoma. Since a screen detected population was utilised, all patients in this cohort were women age 50–64. The average age of the ILC group was 57.6 and 55.7 years for the IDC group. There were 316 patients diagnosed with ILC and 1961 with IDC, with 239 and 1694 undergoing Breast Conserving Surgery (BCS) respectively. Tumour sizes were stratified across 4 groups, T1ab (<10 mm), T1c (10–20 mm), T2 (20–50 mm), and T3

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