

Mammographic Surveillance after Breast Reconstruction-Is Imaging Necessary?

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Received date: April 6, 2016; Accepted date: April 20, 2016; Published date: April 30, 2016

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Abstract

Background: There is no consensus in regards to surveillance of women after mastectomy and reconstruction for breast cancer. Mammographic detection rates are low for surveillance after reconstruction and whilst there is insufficient evidence to support annual mammography in these women, there is widespread variation in its use. We aimed to investigate the mode of detection of recurrent disease and comment on the use of surveillance mammography in our population of women undergoing mastectomy and reconstruction.

Method: Data were retrieved from the Auckland Breast Cancer Registry (ABCR). All women with recurrence after mastectomy and reconstruction between 2000 and 2013 were identified from the database. Clinical records were reviewed for type of reconstruction, site of recurrence and mode of detection.

Results: 1565 women underwent mastectomy and reconstruction. There were 54 women (3.4%) with locoregional recurrence (LRR) and 134 with distant disease (8.5%). Of all women with LRR, 51 women (94%) presented with a palpable mass. The remaining 3 women had their recurrence detected on mammography and had DCIS in their original histology. Only 16 of the 54 women had at least one surveillance mammogram. 12 of 16 women had a normal mammogram less than 9 months prior to diagnosis of recurrent disease.

Conclusion: Regular mammographic surveillance after mastectomy and reconstruction was not performed in this group, and therefore we cannot evaluate the value of regular mammographic surveillance after mastectomy and reconstruction. However, in light of the existing body of literature, there is no evidence to support regular mammographic surveillance after mastectomy and reconstruction.

Special Report

Advances in knowledge

This article contributes to a small body of existing literature in regards to the lack of evidence for routine mammographic surveillance after breast reconstruction.

Implications for patient care

Routine surveillance mammography for women after reconstruction is uncomfortable and distressing, and may be unnecessary.

Mammographic detection rates are low and provide false reassurance to women and those involved in the care of these women.

Keywords: Mammographic surveillance; Breast tumour; Locoregional recurrence

Background

There is no consensus in regards to surveillance for ipsilateral breast tumour recurrence in women after autologous or implant-based reconstruction for breast cancer [1,2]. The American Cancer Society recommends surveillance mammography after a skin- or nipple-sparing mastectomy [3], whereas other bodies advise against

mammography after mastectomy and reconstruction [4,5]. Reconstruction minimises deformity and improves psychological outcomes [6,7] establishing its importance in the treatment of women with breast cancer. With more women choosing to undergo mastectomy and reconstruction for breast cancer [8], surveillance amongst these women is increasingly important yet there exists some uncertainty about how this should be done. The reported mammographic detection rate following autologous reconstruction ranges from 0.5% [1] to 1.9% [9,10] and suggests that there is insufficient evidence to justify mammographic surveillance in women who have undergone mastectomy and reconstruction for breast cancer.

The aim of this study was to report on the mode of detection of recurrent disease amongst women who have undergone mastectomy and reconstruction in a New Zealand region and comment on the utility of mammographic surveillance in this cohort.

Methods

Data were retrieved from the Auckland Breast Cancer Registry, which records all breast cancers diagnosed within the Auckland region, including demographics, risk factors, preoperative investigations, surgical information, final histopathology, treatment, locoregional or distant recurrence and date of death. This database was commenced in June 2000 and it is 98% complete for all treated ductal carcinoma *in situ* (DCIS) and breast cancers within the Auckland region. In regards

to recurrence and deaths, the database is manually updated annually by database personnel. Patient information for all women who were diagnosed with recurrent disease after mastectomy and reconstruction was retrieved from the database. In New Zealand, all patients are issued a National Health Index (NHI) number, which is a unique identifier and links all national hospital data. This allows for data from public hospitals to be accessed centrally. Information retrieved included: dates of surgery, pathology, mode of reconstruction, site of recurrence, method of detection, surveillance imaging post-reconstruction and results of any imaging performed. We included all women who underwent mastectomy and immediate or delayed reconstruction, regardless of the type of reconstruction. We excluded women who had undergone mastectomy and reconstruction for risk-reduction, as the risk of invasive disease in this cohort is exceedingly low.

For the purposes of this paper, locoregional recurrence (LRR) was defined as recurrence to the ipsilateral chest wall or axillary nodes.

Results

A total of 1565 women underwent mastectomy and reconstruction between June 2000 to April 2013. There were 224 locoregional or distant recurrences (14.3%); 36 women were excluded due to unavailability of recurrence data. These were largely patients who had their treatment within private institutions and therefore, their information was not accessible using the NHI. Information in regards to site and time to recurrence was complete for 188 patients. There were 54 women with LRR (3.4%) and 134 with distant disease (8.5%). Median age for those with LRR was 46 years (range 30-70 years). Median time to LRR was 20 months (range 8 months-184 months).

The primary histology was invasive carcinoma for 171 women and DCIS for the remaining 17 women (Table 1).

Histology	n (%)
Infiltrating ductal carcinoma	142 (63.4%)
Infiltrating lobular carcinoma	22 (9.8%)
Mucinous carcinoma	3 (1.3%)
Micropapillary carcinoma	1 (0.5%)
Mixed infiltrating and lobular carcinoma	3 (1.3%)
Ductal carcinoma in situ	17 (7.6%)
Unknown	36 (16.1%)

Table 1: Histology of primary cancer for women undergoing mastectomy and reconstruction.

The most common form of reconstruction in decreasing order of frequency was Transverse Rectus Abdominis (TRAM) flap reconstruction (75 women), implant based reconstruction (52 women), Latissimus dorsi (LD) flap reconstruction (18 women) and 1 woman underwent deep inferior epigastric perforator (DIEP) flap reconstruction. Reconstruction data was not available for 42 women.

Of the 54 women with LRR, 51 presented with a self-detected mass that was biopsy proven to be recurrent disease (94%). Only 16 of the 54 women with LRR had at least 1 ipsilateral surveillance mammogram (Table 2). Amongst those who had mammography, 3 women had their

LRR detected mammographically, and the remaining 13 patients were interval cancers. This included 12 women who had normal mammography within 12 months prior to diagnosis of their recurrent disease (range 1-9 months) and 1 woman who had a mammogram 13 months prior. The 3 women with mammographically detected recurrence all had calcification on their surveillance mammograms and had DCIS only in their original histology. Their recurrent disease was not clinically palpable and biopsy demonstrated invasive recurrence. Extensive high-grade DCIS with comedonecrosis was reported originally in 2 of the 3 women, and the third woman had 15 mm of intermediate grade DCIS with a superficial margin of <1 mm.

Site of Recurrence	Surveillance mammogram	Mammogram result
LRR (n=54)	16 (30%)	Normal in 13/16 (81%)* Abnormal in 3/16 (19%)#
Distant (n=134)	38 (36%)	Normal in 37/38 (97%) Abnormal in 1/38 (3%)^

*All women had palpable masses. Mammography done 1-9 months prior to diagnosis
#Biopsy proven recurrent disease
^Biopsy proven scar tissue only

Table 2: Number of women with a surveillance mammogram and result by site of recurrence.

Of women with distant disease, only 38 women had at least 1 ipsilateral surveillance mammogram, and 107 women had no ipsilateral mammogram at all. Ipsilateral mammography resulted in 1 biopsy for scar tissue only.

Discussion

We found that 94% of women with LRR in our cohort presented with a palpable mass. This is consistent with previous literature demonstrating that LRR after skin-sparing mastectomy and reconstruction is palpable during physical examination in 96–100% of women [1,11,12]. The only mammographically detected recurrences in our cohort were women who had extensive DCIS in their original histology. This would lend support to the argument that surveillance mammography after reconstruction is logically targeted towards women who had widespread DCIS originally [1,13,14].

LRR after mastectomy and reconstruction ranges from 2.2-7% [12,13,15,16] in the literature, and is not significantly different from mastectomy alone [12,17]. This despite the fact that up to 81% of women have residual glandular tissue and terminal duct lobular units (TDLU) in the skin flap after a skin-sparing mastectomy [18]. It is generally accepted that implant reconstruction does not require surveillance as local recurrence will be anterior to a submuscular prosthesis and will therefore be clinically palpable [1,10,12,15]. Whilst some advocate for early detection of LRR with a view to improving survival, this theoretical benefit is extrapolated from data on population screening rather than in those whose risk of mortality is already determined by their primary breast cancer [19]. Langstein et al. reported that there was no difference in time to detection between subcutaneous (72% of all LR) or deep chest wall recurrences (28% of all LR) and there was no statistically significant difference in overall survival between the 2 groups [13]. It is worth noting that most

recurrences in our cohort were distant recurrences, as would be expected.

Mammographic pick-up rates range from 0.5% to 1.9%, [1,9,10] and most women will present with a mass or pain [10,11]. Our mammographic detection rate is higher than that quoted in the literature due to the inconsistency in the use of imaging. Significantly, the false negative rate in our group was unacceptably high with 12 of the 16 women having normal mammography between 1 to 9 months prior to diagnosis of their recurrent disease. This provides false reassurance to women and their clinicians. Given our low rate of routine mammography, the biopsy rate for additional findings was similarly low.

One limitation of our study is the retrospective nature. Data was missing for 36 women (16%), and nature of their recurrence was unknown. However, we do have a reasonably large cohort with a combined recurrence rate (LRR and distant) that is comparable with that reported in the literature, suggesting that appropriate patients are being chosen to undergo reconstruction.

Conclusions

The lack of standardized surveillance in these women causes confusion and angst for patients and those involved in the primary care of women after breast cancer. Regular mammographic surveillance after mastectomy and reconstruction was not performed in this group, and therefore we cannot evaluate the value of regular mammographic surveillance after mastectomy and reconstruction. However, our findings are consistent with an existing body of literature that mammographic surveillance after mastectomy and reconstruction is unnecessary. A logical approach seems to be targeted imaging after a careful history and examination.

Acknowledgement

We would like to acknowledge the Auckland Breast Cancer Registry for provision of the data for our study.

Conflict of Interest Statement

The authors have no conflicts of interest and no funding sources to declare.

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