

## Locoregional Recurrence after Neoadjuvant Chemotherapy for Breast Cancer

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### Introduction

Recent studies suggest that breast cancer (BC) patients are at increased risk for locoregional recurrence (LRR) after neoadjuvant chemotherapy (NAC) versus surgery first. Our hypothesis is that LRR after NAC is affected by tumor subtype, NAC response, and extent of breast surgery.

### Methods

We performed a single-institution retrospective review of female, node-positive BC patients with minimum follow-up of 60 months (mo) treated with NAC and breast/lymph node surgery from 2000-2014. Clinical, pathological, treatment, and outcome data were collected. Statistical analyses performed using Wilcoxon rank sum test and Pearson's correlation.

### Results

After median follow-up of 88mo (range 60-226), 225 NAC cases (224 patients) were reviewed; median age 51 years (range 20-76) and median BMI 28 kg/m<sup>2</sup> (range 14-55). Most (168, 75%) received anthracycline-based NAC. Overall 13 (8%) LRR; no LRR after NAC that included targeted Her2 agents (0/57)( $p=0.14$ ). No differences in LRR by tumor subtype ( $p=0.87$ ), hormone receptor status ( $p=0.46$ ), grade ( $p=0.49$ ), or histology ( $p=0.67$ )(Table).

After NAC, 172 (76%) had mastectomy and 161/172 (94%) post-mastectomy radiation (PMRT), 63/161 (39%) with regional nodes (RNRT). 53 patients had lumpectomy and 51/53 (96%) adjuvant radiation (RT), 28/51 (55%) with RNRT.

There was no difference in LRR comparing in-breast partial response, pathological complete response (pCR), and no response to NAC ( $p=0.75$ ). Patients without nodal pCR (152/225, 66%) had increased risk of LRR vs patients with nodal pCR ( $p=0.05$ ). Cases with ypN2 (8/45, 18%) or ypN3 (3/23, 13%) had higher risk of LRR than ypN0 (1/73, 1.4%) or ypN1 (1/84, 1.2%) ( $p=0.001$ ).

Among 13/255 (6%) patients who experienced LRR, 6 were treated with lumpectomy and RT (2/6 with RNRT) at median time to LRR of 27mo (IQR 21-33). The other 7 received PMRT (5/7 with RNRT), with median time to LRR of 33mo (IQR 22-40). Risk of LRR was higher after lumpectomy with recurrence rate of 11% vs 4% ( $p=0.048$ ).

### Conclusions

Overall incidence of LRR after NAC and 5+ years follow-up is comparable to published LRR rates after surgery first. In-breast response did not affect LRR risk. Our study found higher ypN stage and breast conserving surgery were significantly associated with LRR.

Table: Variables and outcomes by breast cancer subtype.

	<b>Total N=225*</b>	<b>Luminal A n=6 (2.6%)</b>	<b>Luminal B n=103 (45.7%)</b>	<b>Triple-negative n=45 (20%)</b>	<b>HER2+ n=33 (14.7%)</b>	<b>Triple-Positive n=37 (16.4%)</b>
<b>Median age (IQR)</b>	51 years (43-57)	45 years (42-58)	50 years (56-63)	50 years (45-56)	57 years (46-60)	47 years (41-55)
<b>IDC (n, %)</b>	197 (88%)	4 (67%)	82 (80%)	44 (98%)	32 (97%)	35 (95%)
<b>Nottingham Grade III (n, %)</b>	134 (60%)	0 (0%)	46 (45%)	38 (84%)	26 (79%)	24 (65%)
<b>Median T (mm)</b>	41	42	40	40	50	40
<b>Breast pCR (n, %)</b>	64 (28%)	0 (0%)	15 (15%)	20 (44%)	15 (45%)	14 (38%)
<b>Nodal pCR (n, %)</b>	73 (32%)	2 (33%)	22 (21%)	19 (42%)	17 (52%)	13 (35%)
<b>Both breast and nodal pCR (n, %)</b>	45 (20%)	0 (0%)	9 (8.7%)	14 (31%)	13 (39%)	9 (24%)
<b>Locoregional recurrence (n, %)</b>	13 (5.8%)	0 (0%)	7 (6.8%)	3 (6.8%)	3 (9.0%)	1 (2.3%)
<b>Distant recurrence (n, %)</b>	36 (16%)	2 (33%)	21 (20%)	4 (8.9%)	4 (12%)	5 (14%)
IQR: interquartile range; IDC: invasive ductal carcinoma; T: size of tumor at presentation; pCR: pathologic complete response; *1 patient with insufficient pathologic information to assign subtype						