Sentinel Lymph Node Removal after Neoadjuvant Chemotherapy: When to Stop?

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Background

- Sentinel lymph node (SLN) surgery has been accepted as an accurate way to stage the axilla in breast cancer patients undergoing both primary surgery and surgery following neoadjuvant chemotherapy (NAC)
- For patients undergoing primary surgery, it has been shown that if a SLN is going to be positive, it is likely to be one of the first four LNs removed
- The maximum number of SLNs to be resected to accurately stage the axilla in patients undergoing NAC for the treatment of clinically node negative (cN0) breast cancer has not been determined

Aim

We sought to determine the sequence of removal of the positive SLNs in this patient population

Methods

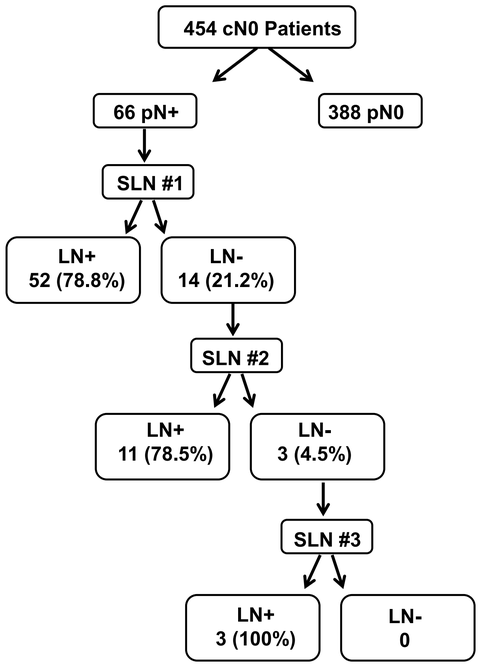
- After IRB approval, all women ≥ 18 years of age with cN0 invasive breast cancer treated with NAC followed by definitive surgical resection including SLN surgery at Mayo Clinic Rochester between 9/2008 and 9/2018 were identified
- Patients with clinically node positive disease at the time of diagnosis were excluded
  - Axillary ultrasound at the time of diagnosis was standard
- Clinical, pathologic, and treatment data were abstracted with retrospective review of the EMR
- Patient, tumor, and SLN removal characteristics were compared between pathologically node (pN) negative and positive patients using univariate analyses
- The number of SLNs removed was analyzed as the gross number removed by the surgeon, not the number reported by pathology
- For patients with pN+ disease, we recorded where the first positive SLN was in the sequence of SLN removal

Results

	pN0 (N=388)	pN+ (N=66)	Total (N=454)	p value
Age at Surgery				0.14[3]
N	382	66	448	
Mean (SD)	51.9 (12.3)	49.4 (9.8)	51.5 (11.9)	
Clinical Tumor Category				<0.0001[1]
T1	82 (21.1%)	7 (10.6%)	89 (19.6%)	
T2	253 (65.2%)	33 (50.0%)	286 (63.0%)	
T3	49 (12.6%)	24 (36.4%)	73 (16.1%)	
T4	4 (1.0%)	2 (3.0%)	6 (1.3%)	
Tumor Biology				0.0001[1]
Missing	6	0	6	
HR+/HER2-	133 (34.8%)	41 (62.1%)	174 (38.8%)	
HR+/HER2+	86 (22.5%)	14 (21.2%)	100 (22.3%)	
HR-/HER2+	39 (10.2%)	1 (1.5%)	40 (8.9%)	
HR-/HER2-	124 (32.5%)	10 (15.2%)	134 (29.9%)	
# of SLNs removed				0.87[3]
N	377	66	443	
Mean (SD)	3.1 (1.5)	3.1 (1.7)	3.1 (1.5)	
Median	3.0	3.0	3.0	
Q1, Q3	2.0, 4.0	2.0, 4.0	2.0, 4.0	
Range	(1.0-10.0)	(1.0-8.0)	(1.0-10.0)	
# of SLNs positive				
N		66		
Mean (SD)		1.7 (0.9)		
Median		1.0		
Q1, Q3		1.0, 2.0		
Range		(1.0-5.0)		
1st Positive SLN position				
1		52 (78.8%)		
2		11 (16.7%)		
3		3 (4.5%)		

[1]Chi-Square [2]Fisher Exact [3]Wilcoxon

SLN Positivity Order



All positive SLNs were identified within the first 3 resected sentinel nodes

Discussion

- A similar number of SLNs (median 3) were removed for both patients with and without lymph node metastases
- In patients with a positive SLN, that node was identified within the first 3 nodes

Conclusions

- Among cN0 patients treated with NAC for breast cancer, if a positive SLN is present, it is most commonly identified as the first sentinel node, and was identified by the third node in all cases in our series
- This suggests that once 3 SLNs have been identified and resected, resection of additional sentinel lymph nodes does not add diagnostic value
- Therefore the number of SLNs removed in patients with cN0 disease at diagnosis who undergo NAC could be limited to the first three nodes