Implementation of Sentinel Lymph Node Biopsy Following Neo Adjuvant Chemotherapy in Clinically Node Positive Breast Cancer

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BACKGROUND

- Multiple prospective clinical trials have recently evaluated the feasibility of sentinel lymph node biopsy (SLNB) in patients with clinically positive nodes undergoing neo adjuvant chemotherapy (NCT).
- The data have shown that a low false negative rate can be attained in patients who become clinically node negative after NCT provided that adequate nodal sampling is performed.
- The adoption of this approach into clinical practice may be limited, leaving patients unnecessarily exposed to the morbidity of an axillary node dissection.
- The aim of the present study was to assess the implementation of recent clinical trial data regarding the feasibility of SLNB following NCT for clinically node positive patients, and determine factors associated with variation in clinical practice.

METHODS

- A retrospective analysis of the National Cancer Database was performed, consisting of women with stage 1-3 invasive breast cancer from 2012 to 2015 with clinically positive nodal disease and who underwent NCT.
- Pathological complete response (pCR) in the nodes was defined as absence of regional lymph node metastasis on final pathology.
- Chi square analyses were performed to compare rates of pCR in patients with axillary lymph node dissection (ALND).

STUDY POPULATION CHARACTERISTICS FOR PATIENTS UNDERGOING NEOADJUVANT CHEMOTHERAPY WITH CLINICALLY NODE POSITIVE DISEASE

Characteristic	No SLNB n=5574		SLNB alone n=1405		SLNB + ALND n=1859		
	n	%	n	%	n	%	
Age group (years)							
<40	808	60.3	249	18.58	283	21.12	p=0.0002
40-54	2,322	61.58	638	16.92	811	21.51	
55-69	2,039	65.37	438	14.04	642	20.58	
>=70	405	66.61	80	13.16	123	20.23	
Income							
High SES	1,853	59.07	550	17.53	734	23.4	p<0.001
Low SES	3,721	65.27	855	15	1125	19.73	
Insurance							
Not insured	310	74.7	44	10.6	61	14.7	p<0.001
Private insurance	3,392	60.11	987	17.49	1264	22.4	
Public	1,872	67.34	374	13.45	534	19.21	
Facility type							
Academic/Research	1,695	65.88	351	13.64	527	20.48	p=0.0002
Other	3,879	61.92	1054	16.82	1332	21.26	
Volume							
Low volume	364	66.3	84	15.3	101	18.4	p=0.074
Medium volume	1,741	64.6	403	14.95	551	20.45	
High volume	3,469	62.01	918	16.41	1207	21.58	
Grade							
Low/intermediate	2,849	62.19	715	15.61	1017	22.2	p=0.0201
High	2,725	64.01	690	16.21	842	19.78	
CDCC							
CDCC 0	4,818	62.45	1,279	16.58	1618	20.97	p<0.001
CDCC >/=1	756	13.56	126	8.97	241	12.96	
Markers							
HR^C-positive / HER2-negative	3,829	64.24	842	14.13	1289	21.63	p<0.001
HR-negative / HER2-positive	26	60.47	5	11.63	12	27.91	
HR-positive / HER2-positive	1,596	60.14	523	19.71	535	20.16	
Triple negative	87	67.97	27	21.09	14	10.94	
unknown	36	67.92	8	15.09	9	16.98	

PATHOLOGICAL COMPLETE RESPONSE (pCR) IN PATIENTS UNDERGOING NEOADJUVANT CHEMOTHERAPY IN CLINICALLY NODE POSITIVE DISEASE

Characteristic	pCR		No pCR		
	n	%	n	%	
Age group (years)					
<40	84	29.68	199	70.32	p=0.0011
40-54	182	22.44	629	77.56	
55-69	115	17.91	527	82.09	
>=70	28	22.76	95	77.24	
Clinical N					
C1	346	22.05	1223	77.95	P=0.0171
C2	31	16.58	156	83.42	
C3	32	31.07	71	68.93	
Pathological T					
T0	155	72.77	58	27.23	p<0.001
T1	188	22.41	651	77.59	
T2	56	9.62	526	90.38	
T3/T4	10	4.44	215	95.56	
Grade					
Low/intermediate	154	15.14	863	84.86	p<0.001
High	255	30.29	587	69.71	
CDCC					
CDCC 0	372	22.99	1246	77.01	p=0.0076
CDCC >/=1	37	15.35	204	84.65	
Markers					
HR^C-positive / HER2-negative	194	15.05	1095	84.95	p<0.001
Others	215	37.72	355	62.28	

RESULTS

- A greater proportion of ALNDs were performed in non-academic institutions (1,332, 71.7%).
- Age 40-54 years (811, 44%), patients low comorbidity scores (1,618, 87%), and lower socioeconomic levels (1,125, 60%) were all also associated with higher rates of ALND.
- Patients with hormone receptor positive/Her 2 negative tumors (1,289, 69%), and tumors of low/intermediate grade (1,017, 55%), were more likely to undergo ALND.
- Of 1,857 women, 22% had a pCR.

CONCLUSIONS

- Despite the promising results shown in prospective, randomized clinical trials, a large proportion of patients with complete nodal response to NCT still undergo ALND.
- These patients are susceptible to the morbidity associated with this procedure.
- Over 20% of patients with clinically positive nodes treated with NCT were found to be pN0 at the time of ALND.
- Specific facility, patient, and tumor characteristics were associated with clinical practice variation in the use of SLNB following NCT.
- Although a portion of patients may have had clinical indications for ALND, our findings suggest that barriers may exist in the translation of clinical trial findings to routine practice.
- Efforts to address these potential barriers may result in better outcomes for patients treated for breast cancer.