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Self-Reported Management of Inflammatory Breast Cancer Among the American Society of Breast Surgeons Membership: Consensus and Opportunities

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ABSTRACT

Background. Inflammatory breast cancer (IBC) is rare and biologically aggressive. We sought to assess diagnostic and management strategies among the American Society of Breast Surgeons (ASBrS) membership.

Patients and Methods. An anonymous survey was distributed to ASBrS members from March to May 2023. The survey included questions about respondents' demographics and information related to stage III and IV IBC management. Agreement was defined as a shared response by >80% of respondents. In areas of disagreement, responses were stratified by years in practice, fellowship training, and annual IBC patient volume.

Results. The survey was administered to 2337 members with 399 (17.1%) completing all questions and defining the study cohort. Distribution of years in practice was 26.0% 0–10 years, 26.6% 11–20 years and 47.4% > 20 years. Overall, 51.2% reported surgical oncology or breast fellowship training, 69.2% maintain a breast-only practice, and 73.5% treat < 5 IBC cases/year. Agreement was identified in diagnostic imaging, trimodal therapy, and mastectomy with wide skin excision for stage III IBC. Lack of agreement was identified in surgical management of the axilla; respondents with < 10 years in practice or fellowship training were more likely to perform axillary dissection for cN0–N2 stage III IBC. Locoregional management of stage IV IBC was variable.

Conclusions. Among ASBrS members, there is consensus in diagnostic evaluation, treatment sequencing and surgical approach to the breast in stage III IBC. Differences exist in surgical management of the cN0–2 axilla with uptake of de-escalation strategies. Clinical trials are needed to evaluate oncologic safety of de-escalation in this high-risk population.

Keywords Inflammatory breast cancer · Trimodal therapy · Surgical de-escalation · American Society of Breast Surgeons

Inflammatory breast cancer (IBC) is a rare and biologically aggressive form of breast cancer characterized by rapid clinical progression and tumor emboli within the dermal lymphatics, resulting in edema and often a "peau d'orange" appearance of the skin. Thirty percent of IBC patients present with de novo distant metastatic disease, compared with 6–10% of non-IBC patients.[1,2] Matched by stage, IBC patients have a higher likelihood of locoregional recurrence[3] and worse breast cancer-specific survival compared with locally advanced non-IBC.[4] While the diagnosis is clinical without a pathognomonic biomarker, a

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quantitative classification tool based on clinical criteria has been described[5] and validated.[6]

For nonmetastatic stage III IBC, National Comprehensive Cancer Network (NCCN) guidelines recommend trimodal therapy, consisting of anthracycline/taxane-based neoadjuvant chemotherapy (NAC) and human epidermal growth factor receptor 2 (HER2) targeted therapy for patients with HER2+ disease, modified radical mastectomy (MRM), adjuvant radiation to the chest wall and regional lymphatics, and endocrine therapy if estrogen receptor (ER) or progesterone receptor (PR) positive disease with targeted adjuvant therapies as indicated by subtype for residual disease.[7] No established guidelines exist for locoregional management of stage IV IBC.

While systemic therapy advances have dramatically improved breast cancer outcomes over the past 20 years, survival rates for IBC patients, and particularly patients with non-HER2 amplified IBC, have not improved to the same extent. At our institution with contemporary systemic therapy, 99% negative surgical margins, and postmastectomy radiation therapy (PMRT) always inclusive of regional nodal irradiation (RNI), 5-year overall survival is still only 70%.[8] This suggests ongoing research is needed to elucidate the biologic underpinnings of IBC and care should be taken to avoid any preventable recurrence due to undertreatment.

IBC patients have been excluded from the clinical trials demonstrating feasibility and oncologic safety of skin- and nipple-sparing mastectomy, sentinel lymph node biopsy (SLNB), and immediate reconstruction. As multidisciplinary de-escalation strategies to reduce long-term sequelae have emerged in breast cancer management, the question has been raised whether these same strategies can be applied to IBC patients.

Our objective was to better understand the current diagnostic and surgical management of IBC patients among the membership of the American Society of Breast Surgeons (ASBrS). We surveyed the ASBrS membership and collected information on surgeon self-reported practice. We sought to identify areas of consensus as well as practice differences and to determine if surgical de-escalation approaches were being implemented. Finally, we sought to identify opportunities for education and future research.

PATIENTS AND METHODS

An anonymous survey was created and approved by the ASBrS Research Committee and distributed to members from March to May 2023. Respondents reported demographic information, geographic practice location and practice type (academic–university, academic–community, hospital/health plan employed, or private practice). The number of years in practice following completion of residency or fellowship were reported, as well as specialty fellowship training and estimated number of IBC patients managed in a typical year. They also responded to questions regarding clinical management of stage III and IV IBC. Agreement was defined as a shared response by > 80% of respondents. Areas of disagreement were stratified by years in practice (10-year increments), fellowship training, and self-estimated IBC patient volume (low: ≤ 5 patients annually; high: > 5 patients annually). Fisher's exact test was used to quantify the strength of the evidence for associations between demographic variables and survey responses. Statistical analyses were performed using R version 4.3.1.

RESULTS

Respondent Demographics and Practice Characteristics

The survey was distributed to 2337 ASBrS members. A total of 399 (17.1%) surgeons responded to all survey questions and constitute the study cohort. Respondents' clinical practice characteristics are summarized in Table 1.

The cohort consists of 104 (26.0%) surgeons with ≤ 10 years of clinical practice, 106 (26.5%) with 11–20 years, 114 (28.6%) with 21–30 years, and 75 (18.8%) with > 30 years. One hundred eighty-seven (46.9%) respondents did not complete a fellowship, 165 (41.4%) completed a breast surgical oncology fellowship and 39 (9.8%) completed a surgical oncology fellowship. One hundred seventy-two (43.1%) respondents are employed by a hospital/health plan and practice in a community setting, 91 (22.8%) practice in an academic setting, 42 (10.5%) are employed by an academic institution but practice in a community setting and 90 (22.6%) are employed in private practice. Two hundred seventy-six (69.2%) respondents maintain a breast-only practice, 86 (21.6%) maintain a majority but not exclusive (51–99%) breast practice and 37 (9.3%) maintain a minority (≤ 50%) breast practice.

Two hundred ninety-three (73.5%) respondents estimated evaluating ≤ 5 IBC patients annually, 87 (21.8%) estimated 5–10 IBC patients annually, and 19 (4.8%) estimated 10–25 IBC patients annually. While 349 (87.5%) respondents reported that IBC patients are treated in a multidisciplinary clinic setting, only 17 (4.3%) reported a specialized multidisciplinary team specifically for IBC at their institution. Twenty-nine (7.3%) respondents reported that they saw IBC patients for surgical recommendations, but those patients were referred outside their institution for medical and radiation oncology consultations.

Diagnostic Evaluation of Stage III IBC

Our survey identified broad agreement in the diagnostic imaging of patients with suspected IBC (Table 2). Three hundred eighty-nine (97.5%) respondents obtain a

TABLE 1 Respondent individual and practice characteristics

Duration of independent clinical practice						
Years	0–10	11–20	21–30	> 30		
N (%)	104 (26.0%)	106 (26.5%)	114 (28.6%)	75 (18.8%)		
Fellowship training						
Type	None	Breast surgical oncology	Surgical oncology	Other		
N (%)	187 (46.9%)	165 (41.4%)	39 (9.8%)	8 (2.0%)		
Clinical practice setting						
Setting	Hospital/health plan, community	Academic, university	Academic, community	Private practice	Other	Retired
N (%)	172 (43.1%)	91 (22.8%)	42 (10.5%)	90 (22.6%)	3 (0.8%)	1 (0.3%)
Breast surgery as a component of overall clinical practice						
Breast % of practice	100%	51–99%	< 50%			
N (%)	276 (69.2%)	86 (21.6%)	37 (9.3%)			
Geographic location of clinical practice						
Location	South	Northeast	Midwest	West	Other	
N (%)	127 (31.8%)	97 (24.3%)	85 (21.3%)	79 (19.8%)	11 (2.8%)	
Individual respondent IBC annual volume						
No. patients/year	0–5	5–10	10–25			
N (%)	293 (73.5%)	87 (21.8%)	19 (4.8%)			
IBC clinical practice model						
Model	IBC-specific multidisciplinary clinic	Multidisciplinary team clinic	Surgical recommendations by respondent, outside referral for medical and radiation oncology			
N (%)	17 (4.3%)	349 (87.5%)	29 (7.3%)			

IBC inflammatory breast cancer

TABLE 2 Areas of respondent agreement in the diagnostic evaluation and treatment of stage III IBC

Diagnostic evaluation	
Imaging modality	Routinely obtain/ perform respondent *N* (%)
Mammogram	389 (97.5%)
Breast ultrasound	317 (79.4%)
Ipsilateral axillary ultrasound	355 (89.0%)
PET/CT or CT chest/abdomen/pelvis and bone scan	357 (89.5%)
Treatment	
Therapeutic approach	Respondent *N* (%)
Trimodal therapy	395 (95%)
Surgery 3–4 weeks after chemotherapy completion	337 (84.5%)
Total mastectomy including excision of nipple–areola complex and all abnormal appearing skin	327 (82.0%)
cN3: level I + II ALND ± level III nodes	329 (82.5%)
cN3: supraclavicular RNI with poor response to neoadjuvant chemotherapy	337 (84.5%)
cN3: supraclavicular RNI with favorable response to neoadjuvant chemotherapy	381 (95.5%)

ALND axillary lymph node dissection, *CT* computed tomography, *N* nodal, *RNI* regional nodal irradiation, *PET* positron emission tomography

mammogram, 317 (79.4%) obtain a breast ultrasound, and 355 (89.0%) obtain an ipsilateral axillary/nodal ultrasound for all IBC patients at initial evaluation. Three hundred fifty-seven (89.5%) respondents obtain staging scans [positron emission tomography/computed tomography (PET/CT) or CT chest/abdomen/pelvis and bone scan] at initial evaluation.

Significant differences were found among respondents in the use of contralateral axillary ultrasound, breast magnetic resonance imaging (MRI), skin punch biopsy, and medical photography. Only 58 (14.5%) respondents routinely obtain contralateral axillary/nodal ultrasound for IBC patients, while 224 (56.1%) obtain contralateral axillary ultrasound for select IBC patients, and 107 (26.8%) do not obtain it for IBC patients. Regarding breast MRI, 268 (67.2%) respondents report obtaining it for all IBC patients and 115 (28.8%) obtain it only for select IBC patients.

One hundred seventy-two (43.1%) respondents reported performing skin punch biopsy as a component of the initial diagnostic evaluation in all IBC patients, and 198 (49.6%) perform it in select patients. One hundred twenty-four (31.1%) respondents reported obtaining medical photography for all IBC patients at initial presentation, and 146 (36.6%) obtain it only for select IBC patients. Ninety-four (23.6%) do not recommend or perform medical photography for IBC patients.

Management of Stage III IBC

Respondents agreed on the sequencing of multidisciplinary management of stage III IBC, timing of surgery and surgical technique for managing the breast primary (Table 2). Nearly all (99.0%) respondents endorsed trimodal therapy as their standard approach in stage III IBC. Three hundred thirty-seven (84.5%) respondents reported waiting 3–4 weeks after completing neoadjuvant chemotherapy before surgery. Three hundred twenty-seven (82.0%) reported total mastectomy, including nipple–areola complex and abnormal skin excision, as their approach to surgical management of the breast.

Respondents agreed on ipsilateral axillary management in patients with positive level III axillary lymph nodes or supraclavicular nodes at presentation (cN3). Three hundred twenty-nine (82.5%) reported performing routine level I–II axillary dissection (ALND) with or without level III node excision in these patients. In patients with positive ipsilateral supraclavicular nodes at presentation, 337 (84.5%) respondents reported offering RNI without neck dissection to those with a poor response to chemotherapy, defined as a supraclavicular node $\geq$ 1 cm in size on imaging following chemotherapy completion. In patients with supraclavicular disease with a favorable chemotherapy response, 381 (95.5%) respondents reported offering RNI without surgery.

Significant differences were identified in respondents' standard approach to surgical management of the ipsilateral axilla in clinically node-negative (cN0) and clinically node-positive (cN1–2) IBC patients (Table 3). While 251 (62.9%) respondents reported performing level I–II ALND for cN0 IBC, 140 (35.1%) reported performing SLNB. For patients with cN1–2 IBC, 269 (67.4%) reported performing level I–II ALND, 92 (23.1%) offered targeted axillary dissection (TAD) to those with a favorable response to neoadjuvant chemotherapy, and 15 (3.8%) offered TAD regardless of response to chemotherapy. An additional 10 (2.5%) respondents reported offering SLNB to cN1–2 patients with a favorable response to chemotherapy.

There were significant differences among respondents in their standard approach to postmastectomy breast reconstruction and contralateral prophylactic mastectomy (CPM). Two hundred sixty-six (66.7%) respondents reported offering delayed reconstruction in all cases, while 67 (16.8%) reported offering immediate breast reconstruction in select cases and 49 (12.3%) reported referring to their plastic surgery colleagues to determine reconstruction timing. The majority of respondents reported discouraging CPM at initial operation but offering delayed CPM in select (n = 185, 46.4%) or all (n = 36, 9.0%) cases, while 74 (18.5%) reported offering CPM at initial operation to patients with a pathogenic mutation and 42 (10.5%) reported offering CPM at initial operation to all patients. Thirty-four (8.5%) reported discouraging CPM at any time.

Reported use of routine axillary reverse mapping (ARM) with or without prophylactic lymphovenous bypass (LVB) was variable. The majority (n = 229, 57.4%) of respondents reported they did not routinely use ARM and LVB as strategies to potentially reduce lymphedema among stage III IBC patients. One hundred twenty-eight (32.1%) reported that they use ARM and LVB in select or all patients, and an additional 35 (8.8%) reported referring patients to plastic surgery for delayed management of lymphedema if needed.

When topics with differences in respondent opinion (< 80% agreement) were assessed by years of clinical practice, fellowship training and IBC volume, there was strong evidence for an association between respondent characteristics and choice of axillary surgical management (Table 3). In cN0 IBC patients, respondents with $\leq$ 10 years of clinical practice were more likely to perform level I–II ALND (74.0% $\leq$ 10 years versus 66.0% 11–20 years versus 56.1% > 20 years; p = 0.026). Similarly, in cN1–2 disease, those with $\leq$ 10 years of clinical practice were more likely to perform level I–II ALND (79.8% $\leq$ 10 years versus 67.0% 11–20 years versus 60.8% > 20 years; p = 0.033). Respondents with breast or surgical oncology fellowship training were also more likely to perform level I–II ALND in cN0 IBC patients (71.1% versus 55.4%; p = 0.005) and cN1–2 patients (73.0% versus 61.5%; p = 0.057).

TABLE 3 Stage III IBC axillary management, categorized by years in practice, fellowship training, and annual volume of IBC patients

Variable	Overall	Years in practice				Fellowship training			IBC annual volume		
		0–10	11–20	> 20	*p* value	Yes	No	*p* value	0–5 pts	> 5 pts	*p* value
Management of cN0 axilla											
None	6 (1.5%)	0	1 (0.9%)	5 (2.6%)	0.026	2 (1.0%)	4 (2.1%)	0.005	3 (1.0%)	3 (2.8%)	0.158
SLNB	140 (35.1%)	27 (26.0%)	35 (33.0%)	78 (41.3%)		57 (27.9%)	83 (42.6%)		110 (37.5%)	30 (28.3%)	
ALND	253 (63.4%)	77 (74.0%)	70 (66.0%)	106 (56.1%)		145 (71.1%)	108 (55.4%)		180 (61.5%)	73 (68.9%)	
Management of cN1-2 axilla											
None	1 (0.3%)	0	0	1 (0.5%)	0.033	0	1 (0.5%)	0.057	1 (0.3%)	0	0.682
SLNB	12 (3.0%)	1 (1.0%)	2 (1.9%)	9 (4.8%)		3 (1.5%)	9 (4.6%)		10 (3.4%)	2 (1.9%)	
TAD	107 (26.8%)	18 (17.3%)	32 (30.2%)	57 (30.2%)		48 (23.5%)	59 (30.3%)		80 (27.3%)	27 (25.5%)	
ALND (level I and II)	269 (67.4%)	83 (79.8%)	71 (67.0%)	115 (60.8%)		149 (73.0%)	120 (61.5%)		193 (65.9%)	76 (71.7%)	
ALND (level I, II, and III)	10 (2.5%)	2 (1.9%)	1 (0.9%)	7 (3.7%)		4 (2.0%)	6 (3.1%)		9 (3.1%)	1 (0.9%)	

SLNB sentinel lymph node dissection, *ALND* axillary lymph node dissection, *TAD* targeted axillary dissection, *IBC* inflammatory breast cancer

Diagnostic Evaluation and Management of De Novo Stage IV IBC

Respondents varied significantly in their reported management of de novo stage IV IBC (Table 4). Fifty-four (13.5%) reported offering surgical resection of the breast primary only for palliation of symptoms (pain, bleeding, fungating wound), and 31 (7.8%) reported offering surgical resection of the primary either for palliation or with local progression while on chemotherapy if negative margins could be achieved. Seventeen (4.3%) reported offering primary tumor resection after favorable chemotherapy response as well as for palliation or local progression on chemotherapy. Eleven (2.8%) reported offering primary tumor resection under any of those clinical scenarios and also in the setting of isolated contralateral axillary metastasis (CAM). Ten (2.5%) reported offering primary tumor resection under any of those clinical scenarios and also in the setting of oligometastatic disease. Twenty-five (6.3%) reported that they would not consider breast primary resection in de novo stage IV IBC in any clinical scenario.

Two hundred twenty-eight (57.1%) of those who would offer breast primary resection in patients with de novo stage IV IBC reported that their standard approach is mastectomy, including excision of the nipple–areola complex and all abnormal appearing skin. One hundred forty-one (35.3%) reported considering multiple surgical approaches depending on the clinical scenario. Regarding surgical management of the ipsilateral axilla in de novo stage IV IBC, 116 (29.1%) reported performing level I–II ALND and 102 (25.6%) reported performing TAD if there was a favorable chemotherapy response. Twenty-five (6.3%) reported performing SLNB if there was a favorable chemotherapy response. One hundred thirty-seven (34.3%) reported they would not perform ipsilateral axillary surgery in patients with de novo stage IV IBC.

When asked about adjuvant radiation following breast primary resection in de novo stage IV IBC, 165 (41.4%) respondents reported deferring to radiation oncology for recommendations, while 117 (29.3%) reported offering adjuvant radiation in every case and 99 (24.8%) reported offering it in select cases.

In patients with de novo stage IV IBC and isolated CAM, 96 (24.1%) reported offering neither surgery nor radiation to manage the contralateral axillary disease. One hundred ten (27.6%) reported performing TAD and RNI, and 63 (15.8%) reported offering RNI without surgery. Forty-two (10.5%) reported performing level I–II ALND followed by RNI.

DISCUSSION

This study demonstrates that among ASBrS member surgeons, there is broad consensus in diagnostic evaluation,

TABLE 4 Respondent diagnostic evaluation and management of de novo stage IV IBC

When do you offer surgical resection of the primary breast tumor in de novo stage IV IBC?						
Approach	Palliation only	Palliation or local progression	Palliation, local progression, or favorable response to chemo	Palliation, local progression, favorable response to chemo, or isolated CAM	Palliation, local progression, favorable response to chemo, or oligometastatic	Not in any clinical scenario
N (%)	54 (13.5%)	31 (7.8%)	17 (4.3%)	11 (2.8%)	10 (2.5%)	25 (6.3%)

If you offer resection of the primary, what is your standard surgical approach?						
Surgery	Total mastectomy	Consider multiple approaches	Skin-sparing mastectomy if limited skin involvement	Nipple-sparing mastectomy if no nipple involvement	Breast-conserving surgery with excision of involved skin	Other
N (%)	228 (57.1%)	141 (35.3%)	5 (1.3%)	1 (0.3%)	3 (0.8%)	21 (5.3%)

If you offer resection of the primary, what is your surgical management of the ipsilateral axilla?						
Surgery	ALND	TAD if favorable response to chemo	TAD regardless of response to chemo	SLNB if favorable response to chemo	SLNB regardless of response to chemo	None
N (%)	116 (29.1%)	102 (25.6%)	14 (3.5%)	25 (6.3%)	5 (1.3%)	137 (34.3%)

If you proceed with resection of the primary, when do you recommend adjuvant radiation?					
Approach	Defer to radiation oncology	Every case	Select cases	Never	Other
N (%)	165 (41.4%)	117 (29.3%)	99 (24.8%)	3 (0.8%)	15 (3.8%)

In stage IV patients with isolated CAM, what is your standard approach to locoregional management of the contralateral axilla?							
Approach	ALND + RNI	ALND alone	TAD + RNI	TAD alone	SLNB + RNI	RNI alone	None
N (%)	42 (10.5%)	39 (9.8%)	110 (27.6%)	40 (10.0%)	9 (2.3%)	63 (15.8%)	96 (24.1%)

*Local progression: local progression on chemotherapy but able to achieve negative surgical margins

CAM contralateral axillary metastasis, *ALND* level I and II ± level III axillary lymph node dissection, *TAD* targeted axillary dissection, *SLNB* sentinel lymph node biopsy, *RNI* regional nodal irradiation

trimodal treatment and surgical approach to the breast in stage III IBC. It also identifies significant differences in surgical management approaches to the axilla in stage III IBC patients with reported uptake of de-escalation strategies particularly among surgeons without fellowship training or with > 10 years in clinical practice. Management of de novo stage IV IBC is highly variable in terms of whether the breast primary is resected, approach to the ipsilateral axilla, and contralateral axillary treatment in patients with isolated CAM.

Systemic therapy improvements, most notably the advent of HER2-targeted therapy and immunotherapy, in combination with surgical resection to negative margins and comprehensive adjuvant radiation have resulted in significant outcome improvements among IBC patients. Recent studies demonstrate that the 5-year locoregional recurrence rate (LRR) is 6–7% compared with historical rates as high as 67%, and the 5-year overall survival (OS) is 70% compared with 40–60% 10 years ago.[8–12] These improved outcomes, combined with robust data supporting surgical de-escalation strategies among non-IBC breast cancer patients, have likely led to increased consideration of surgical de-escalation in the management of IBC patients.

However, the evidence base does not yet support surgical de-escalation for IBC. A retrospective study of only 35 patients treated with breast-conserving surgery (BCS) in the UK from 1999 to 2013 reported no difference in survival outcomes compared to patients treated with mastectomy.[13] In contrast to four other contemporary cohorts that found that only 3–17% of IBC patients are cN0 at presentation, 40% of the UK study cohort was cN0.[14–16] Fifteen patients in the UK cohort received neoadjuvant endocrine therapy without chemotherapy, yet their survival outcomes were equivalent to patients in the cohort who received neoadjuvant chemotherapy. Another study of BCS in IBC patients used the Surveillance, Epidemiology, and End Results (SEER) database to identify 3347 IBC cases treated from 1998 to 2010 and found no difference in breast cancer-specific survival or OS between patients who underwent BCS compared with those who underwent mastectomy; however, only 150 (4%) patients underwent BCS and no propensity score matching was performed.[17] These small retrospective studies, with limited classification, should not influence clinical practice. Our study demonstrates that breast surgeons largely agree that mastectomy, including excision of the nipple–areola complex and all abnormal-appearing skin, remains their standard approach for managing the breast primary in stage III IBC patients.

Obtaining negative surgical margins, which may require aggressive skin resection in IBC patients, is critical to ensuring a LRR < 10%. While studies conducted over the past decade reported LRR of 17–21% at 5 years,[18,19] a recent review from the MD Anderson Cancer Center, where all 262 patients had negative surgical margins, found a LRR of 6.9% at 5 years.[8] Yet even with administration of trimodal therapy in a dedicated multidisciplinary IBC clinic, the distant metastasis rate was 35% with an 18-month median time to recurrence.[8] Given that large national database studies demonstrated adherence to trimodal therapy rates as low as 60%,[20] it is reassuring that 99% of surveyed surgeons in our study endorsed trimodal therapy as their standard approach in managing IBC patients.

Our study did identify significant differences among surgeons in their approach to axillary management in IBC patients with cN0 or N1–2 disease with SLNB favored by 35% of respondents for cN0 patients and TAD or SLNB favored by 30.1% of respondents for cN1–2 patients. Previous retrospective studies have identified false negative rates with SLNB ranging from 18 to 25% in IBC patients,[21–23] and a prospective study at MD Anderson found that only 25% of IBC patients successfully map to sentinel nodes even with the use of dual tracers.[24] In this population, poor lymphatic mapping may be due to obstruction/disruption of lymphatic channels by tumor emboli.

The risk of lymphedema in IBC patients undergoing standard-of-care ALND and RNI has been reported to be as high as 50%.[25] Strategies designed to mitigate lymphedema risk are needed, and a recent randomized controlled trial supports the use of ARM and LVB as one such strategy in breast cancer patients undergoing ALND.[26] In this trial of 209 patients with 12–24 months follow-up, the lymphedema rate was reduced from 32% to 9.5% with prophylactic LVB. These results were published in October 2023, several months after our survey was distributed. While gaining in popularity, this approach has not yet been adopted as standard of care and many settings have resource limitations impacting utilization. This may, in part, explain why only 31.5% of our respondents consider offering prophylactic LVB to IBC patients. We anticipate that further maturation of this data will lead to more widespread use of prophylactic LVB among surgeons.

We found that 28.7% of respondents either offer immediate breast reconstruction (IBR) at the time of mastectomy in IBC patients or defer to their plastic surgery colleagues to determine reconstruction timing. Thirty-four percent of respondents offer CPM at the time of mastectomy in some or all cases. While IBR is often performed for non-IBC patients, even those requiring PMRT, data does not support this practice in the IBC population. A retrospective review of 60 IBC patients, which included 16 patients who underwent IBR, found a significantly higher risk of surgical complications and an average 10-day delay in receipt of PMRT in the group who underwent IBR.[27] Another study found that 12 of 13 patients who underwent IBR experienced LRR or a distant event with 50% of these events occurring within 12 months following surgery.[28] An increased risk of surgical

complications resulting in a significant delay in receipt of PMRT in the high-risk IBC population also argues against offering CPM to these patients at the time of initial surgery.

Standard algorithms are not available to guide locoregional management of do novo stage IV IBC. Resection of the breast primary remains controversial in this setting. This is reflected in variable approaches reported by surgeon respondents. Although the EA2108 trial reported no difference in OS or quality of life with primary tumor resection in patients with non-IBC metastatic breast cancer,[29] the benefits of local disease control may be greater in IBC given its extensive skin, breast, and nodal involvement. No prospective studies have evaluated the outcomes of primary tumor resection in do novo stage IV IBC patients, but multiple retrospective studies have demonstrated a survival benefit.[30–33] In a recent study from MD Anderson with a median follow-up of 66 months, median OS was 58 months in patients undergoing MRM compared with 19 months in patients who did not have surgery. On multivariable analysis controlling for receptor subtype and response to neoadjuvant therapy, receipt of MRM was independently associated with improved OS.

Isolated CAM is currently classified as stage IV IBC, but a recent review demonstrated that these patients have a significantly improved prognosis compared with patients with other sites of metastatic disease.[34] Given that 8% of IBC patients present with CAM,[14] there should be consideration for bilateral nodal staging on pretreatment imaging. We also strongly support research on outcomes of IBC patients with isolated CAM to inform the treatment approach. Our study demonstrates that there is significant variability in approach among surgeons with 24% offering neither surgery nor RNI, 16% offering RNI alone, 28% offering TAD and RNI, and 10% offering ALND and RNI.

As our study is a self-reported survey, there are limitations to interpretation. Although the response rate of 17% for all questions was similar to prior ASBrS survey research, the low rate highlights a selection bias that may affect generalizability of our findings. In our study, surgeons reported their standard approaches to diagnostic evaluation and management of IBC patients, but the data does not pertain to specific patients and outcomes. The survey was also conducted one year prior to publication of the findings, and practice patterns may have evolved in that time.

CONCLUSIONS

This study demonstrates that there is consensus in diagnostic evaluation, treatment sequencing, and surgical approach to the breast primary in stage III IBC patients. There are significant differences in surgical management of the axilla among patients with cN0–2 disease with uptake of surgical de-escalation strategies. Clinical trials are needed to determine feasibility and oncologic outcomes of de-escalation approaches among select groups of IBC patients, potentially those with HER2+ disease who are most likely to experience pathologic complete response to neoadjuvant therapy, prior to implementation. The approach to management of de novo stage IV IBC is highly variable, and a prospective study designed to evaluate locoregional and survival outcomes following resection of the primary tumor would add important insights.

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REFERENCES

1. Adesoye T, Lucci A. Current surgical management of inflammatory breast cancer. *Ann Surg Oncol*. 2021;28(10):5461–7. https://doi.org/10.1245/s10434-021-10522-z.
2. Matro JM, Li T, Cristofanilli M, et al. Inflammatory breast cancer management in the national comprehensive cancer network: the disease, recurrence pattern, and outcome. *Clin Breast Cancer*. 2015;15(1):1–7.
3. Warren LE, Guo H, Regan MM, et al. Inflammatory breast cancer and development of brain metastases: risk factors and outcomes. *Breast Cancer Res Treat*. 2015;151(1):225–32.
4. Dawood S, Ueno NT, Valero V, et al. Differences in survival among women with stage III inflammatory and noninflammatory locally advanced breast cancer appear early: a large population-based study. *Cancer*. 2011;117(9):1819–26.
5. Jagsi R, Mason G, Overmoyer BA, et al. Inflammatory breast cancer defined: proposed common diagnostic criteria to guide treatment and research. *Breast Cancer Res Treat*. 2022;192(2):235–43.
6. Lynce F, Niman S, Kai M, et al. Development of a multi-institutional, photograph-rich clinical dataset to test and validate a novel inflammatory breast cancer (IBC) scoring system. Paper presented at: San Antonio Breast Cancer Symposium2023; San Antonio, Texas.
7. Network NCC. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines). Breast Cancer. Version 5.2021 - 2021.
8. Adesoye T, Everidge S, Chen J, et al. Low rates of local-regional recurrence among inflammatory breast cancer patients after contemporary trimodal therapy. *Ann Surg Oncol*. 2023;30(10):6232–40.
9. Thoms WW Jr, McNeese MD, Fletcher GH, Buzdar AU, Singletary SE, Oswald MJ. Multimodal treatment for inflammatory breast cancer. *Int J Radiat Oncol Biol Phys*. 1989;17(4):739–45.

10. Rehman S, Reddy CA, Tendulkar RD. Modern outcomes of inflammatory breast cancer. *Int J Radiat Oncol Biol Phys*. 2012;84(3):619–24.
11. Rosso KJ, Tadros AB, Weiss A, et al. Improved locoregional control in a contemporary cohort of nonmetastatic inflammatory breast cancer patients undergoing surgery. *Ann Surg Oncol*. 2017;24(10):2981–8. https://doi.org/10.1245/s10434-017-5952-x.
12. Cristofanilli M, Valero V, Buzdar AU, et al. Inflammatory breast cancer (IBC) and patterns of recurrence: understanding the biology of a unique disease. *Cancer*. 2007;110(7):1436–44.
13. Brzezinska M, Williams LJ, Thomas J, Michael Dixon J. Outcomes of patients with inflammatory breast cancer treated by breast-conserving surgery. *Breast Cancer Res Treat*. 2016;160(3):387–91.
14. Postlewait LM, Teshome M, Adesoye T, et al. Contralateral axillary metastasis in patients with inflammatory breast cancer. *Ann Surg Oncol*. 2021;28(13):8610–21. https://doi.org/10.1245/s10434-021-10148-1.
15. Fayanju OM, Ren Y, Greenup RA, et al. Extent of axillary surgery in inflammatory breast cancer: a survival analysis of 3500 patients. *Breast Cancer Res Treat*. 2020;180(1):207–17.
16. Kupstas AR, Hoskin TL, Day CN, Boughey JC, Habermann EB, Hieken TJ. Biological subtype, treatment response and outcomes in inflammatory breast cancer using data from the National Cancer Database. *Br J Surg*. 2020;107(8):1033–41.
17. Chen H, Wu K, Wang M, Wang F, Zhang M, Zhang P. A standard mastectomy should not be the only recommended breast surgical treatment for non-metastatic inflammatory breast cancer: a large population-based study in the Surveillance, Epidemiology, and End Results database 18. *Breast*. 2017;35:48–54.
18. Romanoff A, Zabor EC, Petruolo O, et al. Does nonmetastatic inflammatory breast cancer have a worse prognosis than other nonmetastatic T4 cancers? *Cancer*. 2018;124(22):4314–21.
19. Nakhlis F, Regan MM, Warren LE, et al. The impact of residual disease after preoperative systemic therapy on clinical outcomes in patients with inflammatory breast cancer. *Ann Surg Oncol*. 2017;24(9):2563–9. https://doi.org/10.1245/s10434-017-5903-6.
20. Rueth NM, Lin HY, Bedrosian I, et al. Underuse of trimodality treatment affects survival for patients with inflammatory breast cancer: an analysis of treatment and survival trends from the National Cancer Database. *J Clin Oncol*. 2014;32(19):2018–24.
21. Stearns V, Ewing CA, Slack R, Penannen MF, Hayes DF, Tsangaris TN. Sentinel lymphadenectomy after neoadjuvant chemotherapy for breast cancer may reliably represent the axilla except for inflammatory breast cancer. *Ann Surg Oncol*. 2002;9(3):235–42. https://doi.org/10.1007/BF02573060.
22. Hidar S, Bibi M, Gharbi O, et al. Sentinel lymph node biopsy after neoadjuvant chemotherapy in inflammatory breast cancer. *Int J Surg*. 2009;7(3):272–5.
23. Karanlik H, Cabioglu N, Oprea AL, et al. Sentinel lymph node biopsy may prevent unnecessary axillary dissection in patients with inflammatory breast cancer who respond to systemic treatment. *Breast Care (Basel)*. 2021;16(5):468–74.
24. DeSnyder SM, Mittendorf EA, Le-Petross C, et al. Prospective feasibility trial of sentinel lymph node biopsy in the setting of inflammatory breast cancer. *Clin Breast Cancer*. 2018;18(1):e73–7.
25. Farley CR, Irwin S, Adesoye T, et al. Lymphedema in inflammatory breast cancer patients following trimodal treatment. *Ann Surg Oncol*. 2022;29(10):6370–8. https://doi.org/10.1245/s10434-022-12142-7.
26. Coriddi M, Dayan J, Bloomfield E, et al. Efficacy of immediate lymphatic reconstruction to decrease incidence of breast cancer-related lymphedema: preliminary results of randomized controlled Trial. *Ann Surg*. 2023;278(4):630–7.
27. Simpson AB, McCray D, Wengler C, et al. Immediate reconstruction in inflammatory breast cancer: challenging current care. *Ann Surg Oncol*. 2016;23(Suppl 5):642–8. https://doi.org/10.1245/s10434-016-5554-z.
28. Nakhlis F, Regan MM, Chun YS, et al. Patterns of breast reconstruction in patients diagnosed with inflammatory breast cancer: the Dana-Farber Cancer Institute's Inflammatory Breast Cancer Program experience. *Breast J*. 2020;26(3):384–90.
29. Khan SA, Zhao F, Goldstein LJ, et al. Early local therapy for the primary site in de novo stage IV breast cancer: results of a randomized clinical trial (EA2108). *J Clin Oncol*. 2022;40(9):978–87.
30. Akay CL, Ueno NT, Chisholm GB, et al. Primary tumor resection as a component of multimodality treatment may improve local control and survival in patients with stage IV inflammatory breast cancer. *Cancer*. 2014;120(9):1319–28.
31. Partain N, Postlewait LM, Teshome M, et al. The role of mastectomy in de novo stage IV inflammatory breast cancer. *Ann Surg Oncol*. 2021;28(8):4265–74.
32. Dawood S, Ueno NT, Valero V, et al. Identifying factors that impact survival among women with inflammatory breast cancer. *Ann Oncol*. 2012;23(4):870–5.
33. van Uden DJP, van Maaren MC, Strobbe LJA, et al. Better survival after surgery of the primary tumor in stage IV inflammatory breast cancer. *Surg Oncol*. 2020;33:43–50.
34. Díaz-Roldán J, Eguía-Larrea M, Rubio-Sánchez T, Muñoz-Bellvís L. Systematic review of synchronous contralateral axillary metastases in breast cancer: really M1 disease? *Breast Cancer*. 2022;29(1):9–18.