

Breast Implant-associated Anaplastic Large Cell Lymphoma: A Canadian Surgical Oncology Survey

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Background: Breast implant-associated anaplastic large cell lymphoma (BIA-ALCL) awareness has increased, resulting in concerns regarding the safety of implant-based reconstruction. Breast cancer patients are first seen by surgical oncologists, who are therefore potentially the first health-care professionals to encounter concerns regarding BIA-ALCL. We therefore surveyed surgical oncologists on their understanding of BIA-ALCL to better assess potential effects on plastic surgery practice.

Methods: An anonymous web-based survey consisting of 9 multiple-choice questions was sent to breast surgical oncologists that are members of the Canadian Society of Surgical Oncology (n = 135).

Results: Forty-two members responded (n = 42/135, 31%) and all participants were aware of BIA-ALCL. All participants reported that BIA-ALCL has not deterred them from referring patients for implant-based reconstruction. Twenty-two respondents (52%) discuss BIA-ALCL with their patients and 21% (n = 9) believe that BIA-ALCL typically follows a metastatic course. Eight respondents (19%) reported having a poor understanding of BIA-ALCL, while 14% (n = 6) were unable to identify the link to textured implants. There were no statistical differences based on case-load volume.

Conclusions: Approximately half of the respondent Canadian breast surgical oncologists discuss BIA-ALCL with their patients, yet there is a knowledge gap in terms of the epidemiology and clinical-pathological course of BIA-ALCL. It is of utmost importance to ensure that the plastic surgery community aims at including surgical oncologist colleagues in educational platforms regarding BIA-ALCL to ensure collaboration and unity in an effort to offer the most accurate information to patients, and prevent misinformation that may deter patients from seeking implant-based reconstruction. (*Plast Reconstr Surg Glob Open* 2020;8:e3091; doi: 10.1097/GOX.0000000000003091; Published online 24 September 2020.)

INTRODUCTION

It is estimated that 26,900 Canadian women were diagnosed with breast cancer in 2019, representing 25% of all new cancer diagnoses.¹ An estimated 20%–40% of these patients will experience some form of psychological distress, including depression, anxiety, and post-treatment body image distortion.^{2–4} The psychological benefits of breast reconstruction have been proved, with no impact on overall survival rates or primary breast

cancer recurrence.^{3,5,6} However, over the past decade, there has been increasing concern about breast implant-associated anaplastic large cell lymphoma (BIA-ALCL), creating confusion and fear surrounding implant-based reconstruction.⁷ BIA-ALCL has been extensively studied and reported in plastic surgery literature and has become a key focus at several international conferences, including the Canadian Society of Plastic Surgeons and American Society of Plastic Surgeons annual meetings.^{7–10} Interestingly, surgical oncologists are often the first health-care professionals to encounter breast cancer patients in consultation. As a result, early concerns that breast cancer patients may have regarding BIA-ALCL and the safety of implant-based reconstruction are potentially first relayed to surgical oncologists. This can potentially result in preformed biases on the safety of implant-based

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reconstruction before consultation with plastic surgeons, thereby directly impacting the patient’s decision making process. It is therefore of interest to determine the current understanding of Canadian breast surgical oncologists on BIA-ALCL and potential effects it may have on plastic surgeons. To that end, we have surveyed Canadian breast surgical oncologists on their understanding of the epidemiology, pathophysiology, and management approaches to BIA-ALCL to determine how their views may be affecting plastic surgery practice and the need for collaboration to offer a unified and evidence-based view to breast cancer patients.

MATERIALS AND METHODS

After obtaining institutional review board approval, an anonymous web-based survey was sent to Canadian breast surgical oncologists on various aspects of BIA-ALCL ranging from pathophysiology to management. The survey was sent to all members of the Canadian Society of Surgical Oncologists and called for responses from members with a dedicated breast cancer practice. Three reminder emails were sent to all participants throughout the study from January 2019 to October of 2019. The survey consisted of 9 multiple-choice style questions (See appendix, Supplemental Digital Content 1, which displays the complete survey with available options, <http://links.lww.com/PRSGO/B470>). The responses were pooled across all participants for descriptive purposes. Responses were also compared between members with greater or less than 50% of their practice dedicated to breast cancer. Comparison between these cohorts was achieved through a chi-square or Fisher exact test for categorical variables. The corresponding contingency tables are displayed for descriptive purposes. Statistical tests were carried out on SPSS v.22 (IBM Corp, Armonk, N.Y.).

RESULTS

Forty-two members of the Canadian Society of Surgical Oncologists responded to the questionnaire, representing the cohort for the current study. Ontario represented the province with the highest response rate (n = 24, 57.1%). The geographic location of the various respondents is highlighted in Table 1. Seventy-two percent of respondents (n = 30) reported that a minimum of 40% of their practice is dedicated to breast cancer and the complete distribution can be found in Figure 1.

Overall Pooled Survey Results

All respondents (n = 42) reported that they are aware of BIA-ALCL. Overall, 100% of participants (n = 42) reported that the emergence of BIA-ALCL has not significantly impacted their practice in terms of referral to plastic surgery for implant-based reconstruction. No respondent indicated that they discourage implant-based reconstruction as a result of the emergence of BIA-ALCL, and 52% of respondents (n = 22) reported that they continue to encourage implant-based reconstruction. Table 2 summarizes the breast surgical oncologists’ reconstructive

Table 1. Geographic Location of Respondents (n = 42)

Province/State	N (%)
Ontario	24 (57.1)
Quebec	4 (9.5)
Saskatchewan	4 (9.5)
British Columbia	4 (9.5)
Alberta	1 (2.4)
Manitoba	1 (2.4)
Newfoundland	1 (2.4)
Nova Scotia	1 (2.4)
Nebraska	1 (2.4)
North Carolina	1 (2.4)

option of choice and the impact of BIA-ALCL on their referral habits.

Among respondents, 52% (n = 22) discuss BIA-ALCL as a potential risk of implant reconstruction, while 48% (n = 20) reported that they do not discuss BIA-ALCL with their patients. Question 6 of the survey inquired on whether the respondent felt that their overall knowledge of BIA-ALCL was considered “poor,” “intermediate,” or “expert,” and the results are highlighted in Figure 2. Question 7 assessed the understanding of the respondent in terms of the clinical course and management of BIA-ALCL. Sixty-four percent of respondents (n = 27) reported that BIA-ALCL is a locally invasive disease that is typically managed by surgical resection alone. In contrast, 21% of respondents (n = 9) reported that BIA-ALCL is typically metastatic and is either managed with adjuvant chemotherapy following resection (n = 5) or with chemotherapy alone (n = 4). Fourteen percent of participants (n = 6) reported being unaware of the typical clinical course or management of BIA-ALCL. Question 8 of the survey focused on whether the respondent was aware of the particular implant type associated with BIA-ALCL, and the results are highlighted in Figure 3. The results for question 9 of the survey, which pertains to the estimated life time risk of developing BIA-ALCL, is depicted in Figure 4.

Stratification Based on Caseload Volume (<50% versus ≥50% Dedicated Breast Cancer Practice)

Overall, 22 respondents (52%) reported having a minimum of 50% of their practice dedicated to breast cancer. The remaining 20 respondents (48%) reported dedicating less than 50% of their practice to breast cancer. Questions 5–9 of the survey were compared between both cohorts using the chi-square test to assess for differences based on caseload volume. For question 5 of the survey, 13 of 22 of the respondents (59%) in the ≥50% category reported mentioning BIA-ALCL as a risk of implant-based reconstruction. In the <50% category, 9 of 20 respondents (45%) reported mentioning BIA-ALCL to their patients. There was, however, no statistical difference between both cohorts (chi-square test; P value = 0.36). Overall, there were no statistical differences between both cohorts in terms of the percentage of respondents reporting their knowledge to be “poor,” “intermediate,” or “expert” (chi-square test; P value = 0.134) (Table 3). There was also no difference between the 2 groups in terms of the responses for the typical clinical course and management

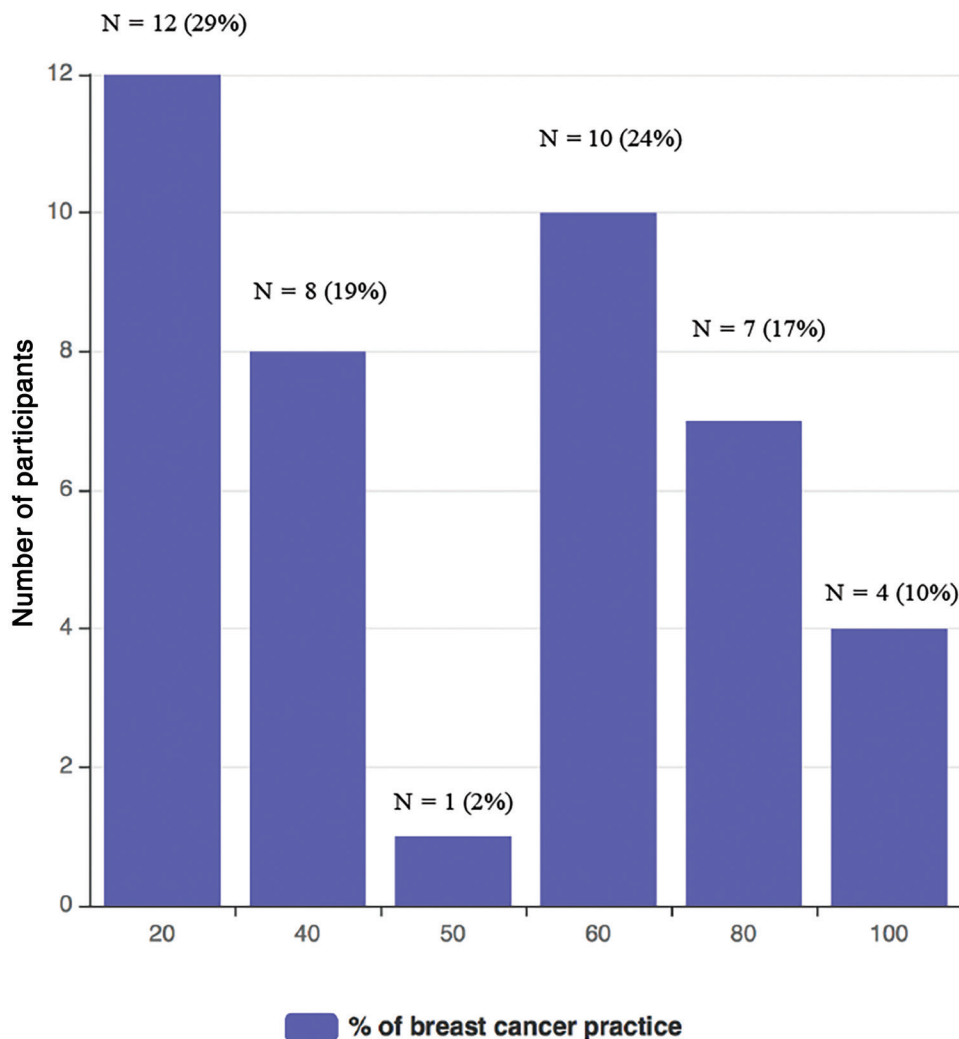


Fig. 1. Results of question 2 of the survey, which pertains to participants' percentage of dedicated breast cancer practice.

of BIA-ALCL (chi-square test; P value = 0.247) (Table 4). In terms of knowledge of the specific implant type associated with BIA-ALCL, there was no statistical difference between both cohorts (chi-square test; P value = 0.544) and the contingency table is displayed in Table 5. In terms of knowledge of the estimated incidence of BIA-ALCL, there was no statistical difference between both cohorts

(chi-square test; P value = 0.580) and the contingency table is highlighted in Table 6.

DISCUSSION

Despite the rarity of BIA-ALCL, with over 600 cases reported worldwide as of November 2018, there has been a significant increase in concern regarding implant-based reconstruction.^{7,9} The need for consensus among the medical community and the importance of transparency and discussions with patients based on evidence-based studies are paramount in dealing with the current situation. Up to date, the plastic surgery community has made excellent strides in dealing with BIA-ALCL, with numerous communications to members of the American Society of Plastic Surgeons and Canadian Society of Plastic Surgeons and several key studies focusing on epidemiology, prognosis, and guidelines.^{7,8,11} This body of evidence provides plastic surgeons with the necessary tools to have evidence-based discussions with patients inquiring about BIA-ALCL in consultation. However, breast cancer patients inquiring

Table 2. Summary of the Results to Question 4: Effects of BIA-ALCL on Reconstructive Preference

	N (%)
I discourage my patients from undergoing implant-based reconstruction	0 (0)
I continue to encourage implant-based reconstruction	22 (52)
I continue to encourage autologous reconstruction	4 (10)
I have no preference in terms of autologous versus implant-based reconstruction, and this has not changed since the emergence of BIA-ALCL	16 (38)
Total	42

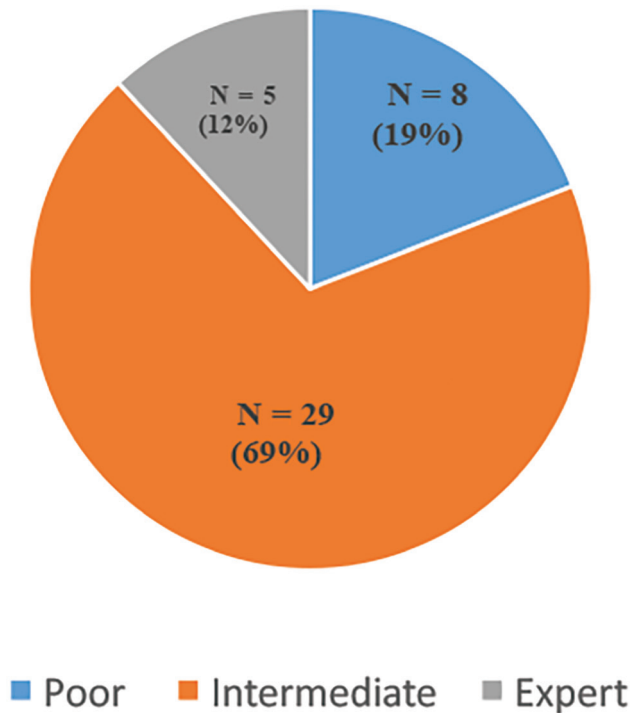


Fig. 2. Results of question 6, which describes participants' subjective view of their overall understanding of BIA-ALCL.

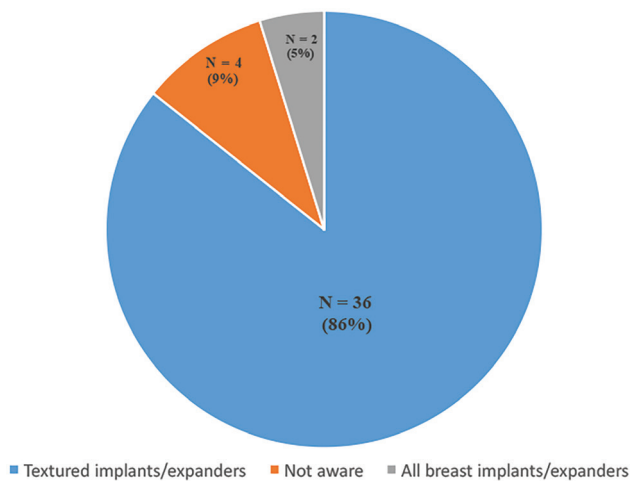


Fig. 3. Results of question 8, which determines whether the participant is aware of the link between textured implants and BIA-ALCL. Of note, none of the participants (0%) reported that it was only related to smooth implants.

about implant-based reconstruction are typically referred by breast surgical oncologists. As a result, despite discussions about breast implants being thought as solely occurring with plastic surgeons, initial fears and concerns regarding BIA-ALCL are potentially first relayed to our colleagues in surgical oncology. Inaccurate information may lead to patient fear or misconceptions, leading to refusal of alloplastic reconstruction, despite attempts made by the plastic surgeon to provide the latest evidence. Furthermore, some patients may never even meet

a plastic surgeon if they have preemptively decided they are not interested in breast reconstruction based on BIA-ALCL fears that are not appropriately addressed by the surgical oncologists.

As highlighted earlier, the need for consensus and a harmonious evidence-based view portrayed by the medical community is of utmost importance. Recognizing the role and importance of our surgical oncology colleagues in dealing with the current situation is critical. The current study provides the first data reporting on the current views of Canadian breast surgical oncologists on BIA-ALCL. Our analysis has demonstrated that 100% of respondents (n = 42) are aware of BIA-ALCL and report that it has not deterred them from referring patients to plastic surgeons for implant-based reconstruction. The current study has however shown that approximately half of Canadian breast surgical oncologists (n = 22/42, 52%) discuss BIA-ALCL with their patients, with 36% (n = 15/42) of the respondents not being able to identify the most typical clinical course, and 21% (n = 9/42) believing that BIA-ALCL is typically metastatic. Interestingly, the cohort of respondents who discuss BIA-ALCL with their patients more accurately answered knowledge-based BIA-ALCL questions including the disease course and treatment. The difference between these cohorts was found to be statistically significant through a chi-square analysis ($P = 0.021$). This provides a certain degree of reassurance in that the majority (n = 19/22, 86%) of surgical oncologists discussing BIA-ALCL with their patients are able to identify the most typical clinical course and management. However, there is still a significant proportion of respondents in both cohorts (14% in the cohort that discusses ALCL and 30% in the cohort that does not discuss ALCL) that believe that it typically follows a metastatic course. Although metastasis is possible with BIA-ALCL, the majority of cases ($\approx 80\%$) are local and treated with surgical excision and total capsulectomies, while more advanced cases may require adjuvant chemotherapy or radiation therapy.^{7,8,12} The misconception that BIA-ALCL is always metastatic may deter patients from seeking reconstruction.

Fourteen percent of breast surgical oncologists were not able to identify the association between textured implants and BIA-ALCL. The distinction between textured and smooth implants is important in the context of BIA-ALCL. A patient who is properly informed that, to date, all cases of BIA-ALCL have a history of a textured device, may be more inclined to consider implant-based reconstruction. As the first contact to breast cancer patients, it is of utmost importance that surgical oncologists avoid the development of patient misconceptions or unfounded fears. The most challenging question was the incidence of BIA-ALCL, with only 19% of participants (n = 8) correctly identifying the incidence at 1:1000–1:10,000.^{7,13} The majority of participants significantly underestimated the incidence, with 40% (n = 17) reporting an incidence of 1:3000–1:30,000. This may be the result of the frequent updates in the literature or the discrepancy of the incidence between implant types. The incidence of BIA-ALCL was initially thought to be around 1:300,000; however, increasing reports and the formation of registries have

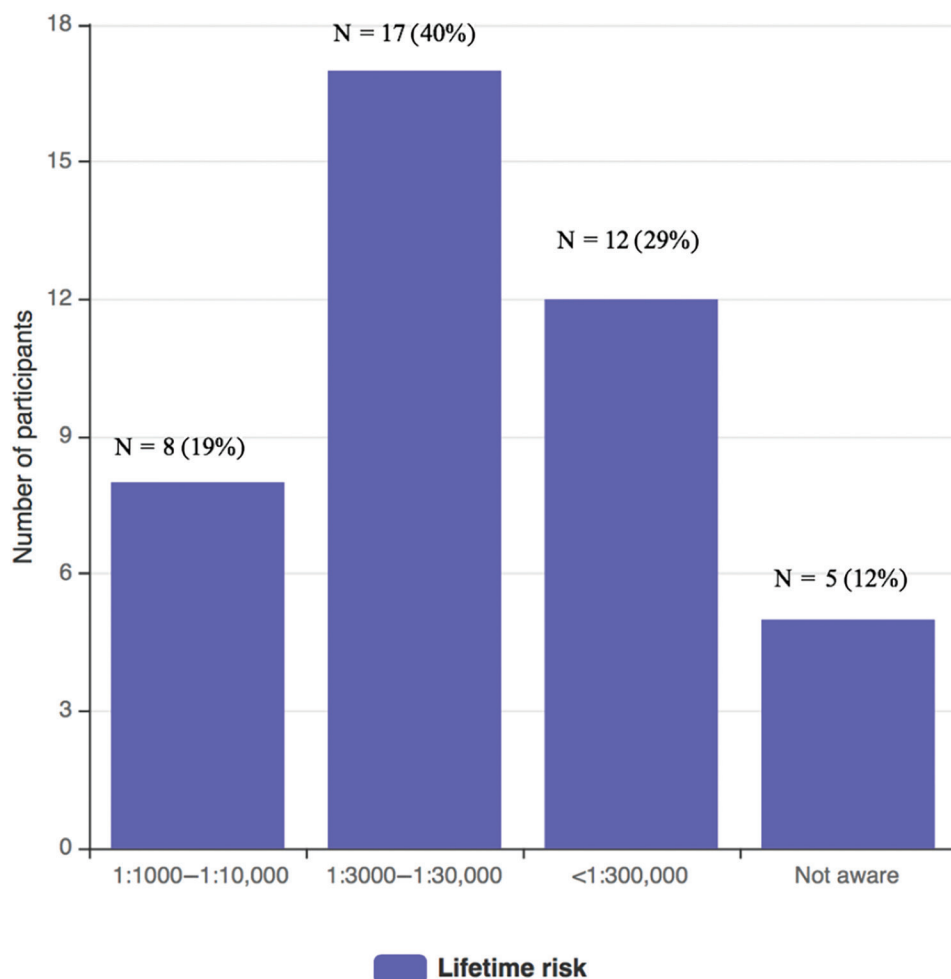


Fig. 4. Results of question 9, which determines whether participants know the current estimated incidence of BIA-ALCL.

Table 3. Responses to Question 6 (How Would You Rate Your Overall Knowledge of BIA-ALCL)

	≥50% Caseload	<50% Caseload
Poor; N (%)	2 (9)	6 (30)
Intermediate; N (%)	16 (73)	13 (65)
Expert; N (%)	4 (18)	1 (5)
Total; N	22*	20*

Stratification based on caseload volume.

*Chi-square test; $P = 0.134$.

Table 4. Responses to Question 7 (What Is the Typical Clinical Course and Management of BIA-ALCL)

	≥50% Caseload	<50% Caseload
Locally invasive + surgical resection; N (%)	17 (77)	10 (50)
Metastatic + surgical resection + chemotherapy; N (%)	1 (5)	4 (20)
Metastatic + chemotherapy; N (%)	2 (9)	2 (10)
Unsure; N (%)	2 (9)	4 (20)
Total; N	22*	20*

Stratification based on caseload volume.

*Chi-square test; $P = 0.247$.

Table 5. Responses to Question 8 (What Implant Type Is Associated with BIA-ALCL)

	≥50% Caseload	<50% Caseload
All implants/expanders; N (%)	2 (9)	0 (0)
Only textured implants; N (%)	18 (82)	18 (90)
Only smooth implants; N (%)	0 (0)	0 (0)
N/A; N (%)	2 (9)	2 (10)
Total; N	22*	20*

Stratification based on caseload volume.

*Chi-square test; $P = 0.544$.

Table 6. Responses to Question 9 (What Is the Estimated Incidence of BIA-ALCL)

	≥50% Caseload	<50% Caseload
<1:300,000; N (%)	8 (36)	5 (25)
1:1000–10,000; N (%)	5 (23)	3 (15)
1:3000–1:30,000; N (%)	6 (27)	10 (50)
N/A; N (%)	3 (14)	2 (10)
Total; N	22*	20*

Stratification based on caseload volume.

*Chi-square test; $P = 0.580$.

led to frequent updates in the literature.^{13,14} A commonly reported incidence is 1:3000; however, higher incidence rates have been reported, with a recent study reporting an incidence as high as 1:443 cases.¹⁵ The impact of genetic factors and regional differences may play a role in the incidence of BIA-ALCL.

We also recognize that the field of prosthetic-based breast reconstruction has further witnessed the emergence of Breast Implant Illness and further studying the perception of this entity among other health care professionals would be valuable. Given this study specifically targeted surgical oncologists, we feel that this was beyond the scope but hope to further address this in future studies. Furthermore, we recognize the lack of generalizability of the current study to all surgical oncologists in Canada, given that our study is limited to surgical oncologists with a breast reconstructive practice. We recognize that there may be potential sampling bias introduced as a result of this.

The findings in the current study demonstrate that although Canadian breast surgical oncologists continue to refer breast cancer patients to plastic surgeons to discuss implant-based reconstruction, there is a knowledge gap in terms of the epidemiology and clinical-pathological course of BIA-ALCL. Furthermore, this study highlights that approximately half of Canadian breast surgical oncologists discuss BIA-ALCL as a risk factor with their patients in consultation before referral to plastic surgery. Given the rise in attention placed on BIA-ALCL in both the medical and social platforms, it is foreseeable that breast cancer patients will discuss this disease early on in their treatment process before consultation with plastic surgeons. As a plastic surgery community, ownership of this entity has been clear and extensive research has been conducted, providing increasing scientific data to patients. This study, however, further serves to highlight the responsibility of our community to push toward inclusion of our surgical oncologist colleagues in educational avenues to shed light on the latest data on BIA-ALCL. The current study has shown that outside the plastic surgery community, the pathophysiology and clinical course of BIA-ALCL remains obscure. Notably, 35% of our surgical oncologist colleagues believe that BIA-ALCL always presents with metastasis or do not know the clinical course. Furthermore, 14% of the cohort (n = 6/42) were unaware of the strong association between BIA-ALCL and textured implants. This information is extremely important in that patients presenting with fears regarding BIA-ALCL can be appropriately counseled and reassured that this entity is specific to textured implants rather than all forms of implant-based reconstruction. It is our duty as a community not only to conduct frontier research on BIA-ALCL but to disseminate these data to our colleagues in breast oncology through educational platforms such as targeted communications, conferences, and other avenues of direct communication.

CONCLUSIONS

Approximately half of respondent breast surgical oncologists discuss BIA-ALCL with their patients before consultation with plastic surgery. However, a proportion mistakenly believe that it typically follows a metastatic course requiring systemic therapy. Many other surgeons significantly underestimate its incidence and are unaware of the strong association to textured implants. Given the increasing concerns regarding implant-based reconstruction and the need to offer a unified evidence-based view to patients, it is of utmost importance to ensure that the plastic surgery community aims at including surgical oncology colleagues in educational platforms regarding BIA-ALCL to ensure collaboration and unity in an effort to offer the most accurate information to patients.

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