ePlasty

ORIGINAL RESEARCH

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Have We Really Shifted to an Evidence-Based Practice? A Qualitative Analysis of Primary Breast Augmentation

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Keywords Breast Augmentation
Argentina
Evidence-Based Practices

September 2024
ISSN 1937-5719

Index ePlasty 2024;24:e52

Abstract

Background. Primary breast augmentation remains the most frequently performed aesthetic surgery worldwide. Advances in this surgery have been incredible, not only from a surgical technique point of view but also since the appearance of new technologies and the better understanding of the interactions between the patient, the breast implant, the usual bacterial flora, and surgical maneuvers. However, there are still several instances of surgical procedure or postoperative medical indications that differ remarkably from one surgeon to another and may even be totally opposite. Due to the lack of a clinical practice guide for performing a primary augmentation mastoplasty, it is important to compare surgeon's procedures and decisions with scientific evidence.

Methods. An anonymous survey composed of 25 multiple choice questions was designed to assess current practice in primary breast augmentation among active members of the Argentinian Society of Plastic Surgery. In January 2020, it was distributed via email. The results of the surveys were compiled by 2 independent reviewers and contrasted with current medical evidence.

Results. A total of 146 surveys were completed by members of the Argentinian Society of Plastic Surgery.

Conclusion. Many differences were found in the behavior of the surgeons surveyed, as well as a lack of correlation between the evidence based on medicine and the usual medical practices or indications. These results should serve as the basis for the realization of a clinical practice guide from a scientific society of plastic surgeons.

Introduction

According to the 2019 International Society of Aesthetic Plastic Surgery survey, breast augmentation is the most frequently performed aesthetic surgery worldwide, with a total of 1,795,551 cases reported.[1] This represents 15.8% of all surgical procedures.

Breast augmentation encompasses several decisions regarding preoperative planning, surgical technique, and postoperative management and, although there is consensus on some of these aspects, there are still many for which there are not.[2-4] Moreover, even though the basic surgical principles of breast augmentation have remained mostly unchanged, better anatomical understanding, rapidly expanding technology, and more detailed technique approaches have led to a refining of the procedure.[5] In addition, the rising incidence of breast implant-associated anaplastic large-cell lymphoma (BIA-ALCL) has had a significant impact on the population's perception, social media awareness, and decision-making, which demands a more thorough approach to patient education and surgical planning.[6]

Recently, Heidekrueger et al[7] conducted an international survey to evaluate current controversies and common practice in breast augmentation. However, only 25 Argentinian plastic surgeons contributed, which gives a very small sample of what happens in the country. The aim of this study is to assess current practice in primary breast augmentation in Argentina and to compare the information with evidence-based medicine.

Methods

An anonymous, 25-item survey was designed to assess current practice in primary breast augmentation using Google Forms. In January it was sent via email to 300 active members of the Argentinian Society of Plastic Surgery. Reminders were sent 4 weeks and 8 weeks later.

The survey was composed of multiple-choice questions. It was divided into 4 sections to address various areas of interest: demographic information, surgical planning, surgical technique, and postoperative management. Inclusion criteria were active plastic surgeons from Argentina who performed cosmetic breast surgery. Those surgeons who performed only breast reconstructive surgery or no breast surgery at all were excluded, as well as residents and fellows. Only fully completed questionnaires were included in the analysis. Data were represented using frequencies and percentages. The results of the surveys were compiled by 2 independent reviewers and contrasted with current medical evidence.

Results

A total of 146 surveys were completed. Results were divided into 4 areas: demographic data, surgical planning, surgical technique, and postoperative management.

Demographic Data

Surgeon experience was divided into 4 intervals of practice time surveyed. Almost 70% had more than 10 years of experience. Sixty percent of the physicians were in private practice, while 40% had a mixed hospital and private practice. According to the nature of the practice, 22.1% performed solely aesthetic surgery, 42.8% performed mostly aesthetic surgery, almost 30% had an equal percentage between aesthetic and reconstructive surgery, and only 8% mostly performed reconstructive surgery. The number of operations performed annually by respondents was variable, but almost 60% of responders performed less than 50 cases per year. Breast augmentation represented 50% of all their practice for 30% of the responders while for 50%, breast augmentation represented between 25% and 50% of all their practice (**Table 1**).

TABLE 1. Demographic Characteristics (% of total respondents)
Years in practice: a) < 5 y (15.2%) b) 5-10 y (17.9%) c) 10-20 y (32.4%) d) > 20 y (34.5%)
Area where you carry out your activities: a) Private facility (57.2%) b) Public hospital (42.8%) c) Both (0%)
Nature of practice: a) 100% aesthetic (22.1%) b) 75% aesthetic and 25% reconstructive (42.8%) c) 50% aesthetic and 50% reconstructive (27.6%) d) 25% aesthetic and 75% reconstructive (7.6%) e) 100% reconstructive (0%)
Number of primary breast augmentations performed annually: a) < 25 (29.7%) b) 25-50 (33.8%) c) 50-100 (25.5%) d) 100-150 (7.6%) e) > 200 (3.4%)
Percentage represented by primary breast augmentation surgery in your practice: a) < 25% (22.1%) b) 25%-50% (51%) c) > 50% (26.9%)

Surgical Planning

According to the implant shell surface, most surgeons surveyed used either 100% smooth (48.6%) or mostly smooth implants (21.2%), in contrast to 12.3% of responders who prefer textured implants solely and 13% who mostly used textured implants. When asked, the main reason cited for the use of smooth implants was the lack of reported association with BIA-ALCL in 86% of cases, followed by the lower cost in 22.6%. Moreover, 60% reported a change in implant shell surface selection since the awareness of BIA-ALCL with a shift to smooth or nanotextured implant placement. Mentor (Mentor Worldwide LLC) implants were most commonly used by respondents. Of note, implant filler type was not asked because in Argentina only silicone implants are available (**Table 2**).

TABLE 2. Surgical Planning (% of total respondents)

Implant shell surface type used:

a) 100% smooth (48.6%)
b) Mostly smooth and to a lesser extent textured (21.2%)
c) Smooth and textured in the same proportion (4.8%)
d) Mostly textured and to a lesser extent smooth (13%)
e) 100% textured (12.3%)
f) Polyurethane (0%)

In the case of using only smooth implants, which is the reason (you can select more than one option)?

a) Lower cost (22.6%)
b) No reported association with BIA-ALCL (86%)
c) Easier to place (18.3%)
d) Aesthetic results do not depend on the shell surface type of implants (21.5%)
e) No device rotation risk (14%)

As a result of the growing concern about Anaplastic Giant Cell Lymphoma (BIA-ALCL), did your practice change at all?

a) No (39.6%)
b) Yes, I use more smooth implants than before (51.4%)
c) Yes, I switched from textured implants to nanotextured devices (9%)

Breast implant manufacturer used:

a) Mentor (52.1%)
b) Allergan (19.9%)
c) Eurosilicone (26%)
d) Nagor (22.6%)
e) Motiva (8.2%)
f) Polytech (11%)
g) Other (6.2%)

Surgical Technique

Regarding surgical technique, there was a preference among Argentinian plastic surgeons for areolar incision placement (52.1% vs 45.9% who preferred an inframammary incision). The dual-plane was the most common pocket location, used in 50% of cases, followed by subglandular and subfascial in 18.5% and 15.8% of cases, respectively. Autologous fat in primary breast augmentation was used to some extent by less than 30% of respondents.

Of those who responded, 70.5% did not use adhesive film dressing to cover nipple areola complexes, and 95.9% of surgeons did not use funnels for implant insertion. When asked about steps taken prior to implant insertion to decrease contamination, 94.5% of respondents changed gloves, 86.2% performed new antisepsis of the field with Betadine, 35.2% changed surgical fields, and only 5.5% used an adhesive film to cover incisions.

Irrigation with either antibiotic with or without Betadine or Betadine alone was performed in 54.8% of cases. Almost 20% were irrigated with saline solution, and 25.3% did not irrigate the pocket. Nearly 100% of respondents administer intravenous antibiotics at induction of anesthesia. Infiltration was 85.4% either locally in the incision (66%) or through regional blocks (75.1%) for pain management. **Table 3** shows that 31.5% of responders did not use drain tubes routinely.

TABLE 3. Surgical Technique (% of total respondents)
Preferred incision: a) Inframammary (45.9%) b) Areolar (52.1%) c) Transaxillary (1.4%) d) Other (0.7%)
Preferred breast implant pocket location: a) Subglandular (18.5%) b) Subfascial (15.8%) c) Dual-Plane (50%) d) Total retromuscular (15.8%)
Use of autologous fat grafting as a complement during primary breast augmentation: a) Always (0%) b) < 50% (28.3%) c) 50% (0.7%) d) > 50% (0.7%) e) Never (70.3%)
Use of local anesthetics (more than one answer can be selected): a) No use (14.6%) b) Incision site infiltration (66%) c) Intercostal nerves blockade (31.3%) d) Pectoralis major block (43.8%)
Use of nipple shields: a) Yes (29.5%) b) No (70.5%)
Use of insertion funnel or similar devices for "non-touch technique" implant placement: a) Yes, always (0.1%) b) No, never (95.9%) c) Sometimes (3.4%)
Which of these measures do you perform prior to placing an implant (you can select more than one option)? a) Changing gloves (94.5%) b) Changing surgery drapes (35.2%) c) New antisepsis with povidone-iodine solution of surgical instruments and fields (86.2%) d) Transparent film dressing application over surgical incision site (5.5%)
Preferred breast implant pocket irrigation: a) Saline solution (19.9%) b) Antibiotics solution alone (30.8%) c) Povidone-iodine solution (11%) d) Antibiotics + povidone-iodine solution (13%)

e) No irrigation (25.3%)
Drain-tube placement: a) Yes, always (28.8%) b) No, never (31.5%) c) Only in cases of bleeding (39.7%)
In case of placing drainages, for how long? a) 24 hours (41.5%) b) 48-72 hours (47.2%) c) 2-5 days (10.4%) d) > 5 days (0.7%)
Prophylactic antibiotic therapy used: a) Only during anesthetic induction (13%) b) During anesthetic induction and 3 to 5 postoperative days (26.7%) c) During anesthetic induction and 5 to 7 postoperative days (59.6%) d) No prophylactic antibiotic use (0.9%)

Postoperative Management

Of the surgeons who responded, 86.3% used postoperative antibiotics for either 3 to 5 days (26.7%) or 5 to 7 days (59.6%). When asked, the main reason for postoperative antibiotics use was the implant in 42.4% followed by precaution in 31.7% of cases. Pain control was managed with NSAID in almost 60.9% of cases, or a combination of NSAID and opioids in 34.42% of cases. Only 1.4% of patients were given opioids alone.

Of the responding surgeons, 72.6% discharged the patient on the same day of surgery. Of the 30% of responders who used drains routinely, 88.7% removed them between 24 and 48 hours after surgery while 10.4% waited between 2 and 5 days.

Regarding postoperative mobilization, 11% of surgeons indicated active movements of the arms from the immediate postoperative period while 75.3% indicated limited activity.

Table 4 shows that 16.4% of surgeons have seen a case of anaplastic large cell lymphoma or late serome in their practice.

TABLE 4. Postoperative Management (% of total respondents)
Why do you prescribe antibiotic therapy in the postoperative period? a) Drain-tube placement (5.8%) b) Implant utilization (42.4%) c) For my own peace of mind (31.7%) d) Lack of evidence (11.5%) e) Other (8.6%)
Outpatient or inpatient basis: a) Same day discharge (72,6%) b) Non-ambulatory intervention, at least spend 24 hours in the hospital (27.4%)
Postoperative pain management: a) Regulated NSAIDs (49.3%) b) Regulated opioids (1.4%) c) NSAIDs + opioids (34.2%) d) Nonregulated NSAIDs (11.6%) e) Other (3.4%)
Mobilization of the patient in the postoperative period: a) Absolute rest without realizing movements with the arms during the first week (13.7%) b) Gentle arm moves could be performed without rising above the limit of the shoulder (75.3%) c) Encouragement to perform movements with arms from the immediate postoperative period(11%)
Did you have a case of BIA-ALCL or late seroma in your practice? a) Yes (16.4%) b) No (83.6%)

Discussion

The scope of this study was to obtain information about practice in breast augmentation among Argentinian plastic surgeons and compare it with the current evidence in the literature. Although a previous article gathered information on countries in Latin America, only a small sample of Argentina was included.

Implant selection plays a major role in obtaining an aesthetically pleasing result, so the type of implant should be taken into account. The differences between textured and smooth implants have been debated in the literature.[8] Although textured implants are associated with lower rates of capsular contracture and malposition, there has been increasing evidence regarding the risk of BIA-ALCL development and texture shell implants.[9,10] Despite the ongoing evidence, a 2018 study reported that plastic surgeons in the US have trended toward increased use of textured implants for cosmetic breast augmentation, with the rate increasing from 2.3% in 2011 to 13% in 2015.[11]

Previous surveys reported at least 80% of surgeons in Europe, Latin America, and Asia used mostly textured implant shell surfaces, while in the United States 85% of respondents used mostly or even exclusively smooth implants.[7] In contrast, in the present study almost 70% of participants reported using smooth implants either exclusively or most of the time compared with 13.4% of plastic surgeons using only textured implants. When asked, the main reason cited for the use of smooth implants was the increased risk of BIA-ALCL with textured implants. Moreover, 60% reported a change in implant surface selection since the increased awareness of BIA-ALCL. Although there is no previous study in Argentina to obtain a trend, this may show an increase in ongoing education from plastic surgery societies about this issue.

Although each incision has its own benefits and indications according to breast anatomy and surgeon preferences, the literature supported the benefit of the inframammary fold (IMF) incision in the reduction of capsular contracture.[12-14] A 2017 meta-analysis carried out by Shangshan Li showed a significantly higher rate of capsular contracture in periareolar incisions compared with inframammary incisions.[15]

Regarding surgical technique, there was a preference among Argentinian plastic surgeons for areolar incision placement. This item is one of the areas of discordance compared with previous studies of common practice in the US or Europe. A 2019 cross-sectional study based on the American Board of Plastic Surgery Maintenance of Certification Tracer Database found that the inframammary fold incision was used in 75.1% of breast augmentations, while the periareolar incision was used in 17.8%.[16] In a 2015 American Society of Plastic Surgeons survey, 83.9% of participants reported a preference for IMF incision placement.[17] In the international survey that included information on Latin American surgeons, the results were similar with a preference of IMF incision in 71.2% of cases.[7]

However, when analyzing the type of incision according to years of practice, there was a generational difference. Of those who had been in practice for 10 years or more, 55% preferred areolar incisions whereas 42% used an IMF approach. In contrast, of those in practice for less than 10 years, 54% used an inframammary approach and 48% used an areolar incision.

Since Tebbets described the dual-plane technique in 2001,[18] the use of this plane had grown due to increasing evidence of it diminishing the incidence of capsular contracture.[19] A 2014 meta-analysis performed by Egeberg et al[20] evaluating the outcomes of 17520 breast augmentations showed that a subglandular implant placement increased the chances of developing a capsular contracture twofold compared with submuscular placement.

This survey showed a preference for dual-plane pocket in half of the cases followed by a subglandular and subfascial pocket in equal percentage. Compared with previous studies, there are some differences. American Society of Plastic Surgeons survey reported dual plane as the most common pocket location in 79.5% of the cases. On the other hand, the international cross-section study showed that Latin American surgeons preferred a subglandular approach in 50% of cases.

A special comment on subfascial implant placement should be made as this is more commonly practiced in Latin America compared with the US or Europe. This difference may be due to the fact that this technique was described by Graf et al in Brazil and rapidly popularized in the region.[21-23]

According to the original description, the advantage of this approach was to obtain a natural breast shape with better soft tissue coverage of the superior upper pole of the implant than a subglandular approach, while eliminating the implant animation associated with submuscular placement.[21] However, Tebbets argued that the thickness of the pectoralis fascia (around 0.5-1 mm) was not enough to provide meaningful coverage.[24]

In a prospective randomized study aimed to investigate whether there were clinical/radiological differences between subfascial and subglandular pockets following primary breast augmentation, the authors found that the choice between subfascial and subglandular planes showed no clinical differences, and the decision should be made according to individual professional experience with no advantages of one over the other.[25]

A recent meta-analysis performed by Gould et al[26] assessed the reported rates of capsular contracture, animation deformity, and complications of subfascial implants. Twenty-two articles were included with a total of 3743 patients. They reported a low complication rate and a low rate of capsular contracture of 1%. They concluded that subfascial breast augmentation may provide the benefits of low rates of capsular contracture while avoiding the discomfort and future animation deformity of subpectoral augmentation.

Adherent film dressings placed over the nipples (also known as "nipple shields") are one of the 14 steps described by Adams et al to minimize bacterial load in breast implant placement.[27] In 1999, Collins et al reported that one-third of swabs taken from the underside adhesive dressings that had been placed on the nipple after skin preparation yielded positive bacterial growth.[28] In 2012, Wixtrom reported similar data in 63 cultured nipples and nipple shields with 34.9% positive for bacterial contamination.[29] Despite the elevated theoretical risk of capsular contracture, the clinical utility of nipple shields remains controversial. A study by Benito Ruiz showed that nipple shields did not make any difference for outcomes when using the trans-axillary method.[30] Wiener reported the only study that showed a significant decrease in the incidence of capsular contracture when Betadine was used as the irrigation solution along with coverage of the nipple-areola complex and incision with Betadine-soaked gauze.[31]

In the present survey, less than 30% of plastic surgeons used nipple shields and only 5.7% used adhesive dressing in incisions. However, this number doubles one of the international surveys, where only 15% of Latin American surgeons used it, and it was similar to that reported for European surgeons.

Introduced in 2009, the Keller funnel is a mechanical polymeric vinyl device developed to aid the insertion of a breast implant into its surgical pocket with the objective of decreasing the risk of implant shell trauma and contamination. A cadaver study demonstrated that the use of a Keller funnel was associated with a 27-fold decrease in skin contact compared with manual insertion resulting in lower bacterial contamination.[32] Theoretically, this may lead to a significant reduction in rates of capsular contracture as stated by various studies.[33-35] However, the main disadvantage is the high cost. According to a

recent American Society of Plastic Surgeons survey, insertion funnels were used consistently by only 21% of US plastic surgeons, with extra cost cited as the primary deterrent by nonusers.[17] Recently, Panczel et al described the use of a sterile plastic saline container that can be converted into a sleeve in a simple, reproducible, and more economical manner.[36] In the present study, less than 1% consistently used insertion funnels.

Perioperative pain control management is an important consideration in cosmetic surgery. Failing in pain management is related to prolonged hospital admissions, a higher risk of persistent postsurgical pain, and decreased patient satisfaction, among other complications.[37] Local anesthesia and regional blocks are valuable and useful tools for plastic surgeons. In breast surgery, multiple regional blocks have been described to achieve better pain control. However, there are conflicting data in the literature regarding their efficacy.

Huang et al described their experience in 320 patients who underwent breast operations under local anesthesia and intercostal block with 1% lidocaine with epinephrine or 0.25% bupivacaine without epinephrine.[38] Although there was no control group, they reported that intercostal block proved to be effective as an anesthetic agent and analgesic. No complications were reported.

Chang et al [39] performed a single-center prospective study in 44 female patients who underwent dual-plane augmentation mammoplasty with general anesthesia and intercostal nerve block. They found that intercostal block performed just before waking up from general anesthesia showed a statistically significant reduction in postoperative pain score and reduction in discharge time.

Shimizu et al [40] reported that combined usage of the intercostal nerve block and tumescent anesthesia effectively reduced pain during breast augmentation. On the other hand, Hidalgo et al[41] performed a study to investigate the efficacy of intercostal nerve blocks and oral methocarbamol for postoperative pain control. In a prospective, randomized, single-blinded clinical trial, 100 primary breast augmentation patients were randomized to 1 of 4 treatment groups: (1) methocarbamol given with intercostal blocks, (2) methocarbamol given without intercostal blocks, (3) no methocarbamol given with intercostal blocks, and (4) no methocarbamol or intercostal blocks given. No significant difference in pain scores and postoperative narcotic use were seen among the groups.

The pectoral nerve block described by Blanco et al[42] involves infiltration of local anesthetic in the plane between the pectoralis major and minor muscles with the objective of anaesthetizing the lateral pectoral nerve. It has been studied that ultrasonography-guided pectoralis block can provide effective analgesia after breast augmentation surgery.[43,44] However, Nasr failed to demonstrate any statistically significant difference in pain scores when comparing pectoralis block with placebo or pectoralis block with intercostal nerve block.[45] In the present study, 43.6% performed pectoralis nerve block routinely, 31.3% intercostal block nerve, and 15% did not perform any infiltration at all.

Combining breast implants with autologous fat grafting is known as composite breast augmentation. The main advantage of combining both techniques is the possibility to control breast volume and shape independently, especially in patients with a deficient soft tissue envelope or breast asymmetries.[46] A recent meta-analysis reported that primary composite breast augmentation is a safe procedure with low complication rates with a trend toward subfascial implant placement and low-fat grafting volumes.[47]

Although useful in particular cases, according to a 2016 US survey, over half of respondents did not practice this technique.[17] There are some concerns regarding the potential risk of malignancy and interference with breast screening. However, multiple studies have shown that autologous fat grafting to the breasts does not increase the risk of breast cancer.[48-50] Furthermore, a systematic review showed that, although the rates of radiologic changes were high after fat grafting, they did not seem to have any therapeutic consequences for the patients.[51.]

The use of periprosthetic antimicrobial solutions decreased the incidence of capsular contracture by approximately 50%, as Burkhardt and colleagues demonstrated in 1986.[52] During the last 20 years, many articles tried to show the importance of this practice, focusing on the ideal antimicrobial solution for irrigating the implant pocket, from combinations of antibiotics with or without classical povidone-iodine (Betadine) solutions to one of the latest products available on the market such as hypochlorous acid (PhaseOne, Integrated Healing Technologies). An article published by Culbertson and colleagues in 2019[53] compared the efficacy of a wide variety of antimicrobial implant pocket irrigation solutions against the most common organisms implicated in periprosthetic breast implant infections, capsular contracture, and BIA-ALCL. Despite the fact that this study was an in vitro analysis, the conclusions highlight the bactericidal efficacy of these solutions, which may correlate with a decrease in breast implant–related surgical complications.

Although there is no international consensus regarding which antimicrobial implant pocket solution is more appropriate for this type of surgery, facts showed that bacterial contamination plays an important role not only in capsular contracture incidence but also in BIA-ALCL development.[54-56] In our survey, results showed that almost half of the participants (45.8%)

did not use any type of antimicrobial solutions for irrigating the breast implant pocket (20.1% use only saline solution and 25.7% do not use any solution). Changes in this tradition should be encouraged by the plastic surgeons' society, switching to an evidence-based approach to guide decisions on which antimicrobial solution is more suitable instead of discussing the need for an antimicrobial solution.

One of the most balanced answers that we recorded in our survey was associated with the placement of a drain tube during the primary breast augmentation procedure. Almost one-third of the participants placed it on a regular basis and a similar percentage of surgeons did not. The remaining 39.6% of the participants declared that the placement of a drain is linked to bleeding situations during the intervention. Currently, there are many published articles that support or oppose the use of drains in primary breast augmentation, but most of them are not high-level evidence-based articles. Gherardini and colleagues reported on a series of 502 patients that underwent primary breast augmentation with the placement of a drain tube.[57] They concluded that the routine use of a drain in a cosmetic breast augmentation surgery should be reconsidered and may be correlated with a decrease in the postoperative complication rate (capsular contracture rate: 0.6% after 1-year follow-up; hematoma rate: 0.6%). On the other hand, Araco and colleagues concluded, based on a single-center review of 3002 patients who underwent primary breast augmentation, that the use of drains was associated with almost a 5-fold increased risk of infections.[58] Moreover, Charles-de-Sá and colleagues executed a case-control study with 150 patients who underwent a primary breast augmentation and were allocated into 2 groups, the "drain tube" group and the control group (without drain placement).[59] They stated that the closed-suction breast drainage in breast augmentation was associated with more cost, was more time-consuming, and did not demonstrate any benefit in decreased postoperative recovery time. This topic needs to be further investigated due to the lack of high-grade scientific evidence, whereby each surgeon would decide to place a drain tube or not based on their personal experience and knowledge.

Another subject that remains uncertain is related to the specific moment when drain tubes have to be removed. The use of an indwelling drain tube in primary breast augmentation is not standardized, and so the time that the drain tube may remain in place varies from one surgeon to another. In our survey, of those surgeons who declared that placing a drain tube is part of their primary breast augmentation intervention, more than 88% answered that the length of time that they use the drain tube is less than 72 hours (41.9% take out the drain tube during the first 24 hours, 46.7% keep it from 48-72 hours). For executing an evidence-based practice on this subject, comprehensive data are still lacking. Araco and colleagues found that in the group where the drain tube was placed, the drain tube was removed 12 hours after surgery.[58] Gherardini and colleagues, in their report of 502 consecutive patients, removed the drain tube before discharge and stated that most of the fluid collection occurs during the first 12 postoperative hours. They also concluded that drains, per se, are not associated with increased infection, but the risk of infection is related to the length of time that a drain is left in the wound, suggesting that the optimal length of time should be from 12 to 18 hours after the intervention.[57] Other authors, based on different criteria, reported that the decision of removing the drain tube was determined when the drainage volume was ≤30 mL in 24 hours.[60]

Prophylactic antibiotics are widely used in primary breast augmentation surgery despite the absence of a widely accepted consensus on this topic.[61] Our survey showed that more than 85% of the participants used antibiotics not only during the anesthetic induction but also during the postoperative period (27.1% up to the 3rd or 5th day after surgery and 59.7% up to the 5th or 7th day postoperative). Although primary breast augmentation is considered a clean procedure, breast tissue contains bacteria, which may lead to a risk for implant contamination and postoperative infection.[62] The risk of surgical site infection (SSI) also varies according to the patient's preoperative risk factors (poor nutritional status, smoking, diabetes, etc.),[63] the surgical technique (transareolar or periareolar approaches, "no-touch technique", the plane of implant insertion, etc.), and finally the implant surface characteristics.[12,64,65] Scientific evidence states that a single dose of intravenous antibiotic is not only optimal for prophylaxis in primary breast augmentation but also minimizes the risk associated with prolonged antibiotic use. This dose should be administered 60 minutes before the skin incision.[66-69] In primary augmentation, a single dose of intravenous weight-based cefazolin before skin incision appears to be adequate. Clindamycin or vancomycin is recommended for patients with β-lactam allergies.[70]

Answers to the reason for using prophylactic antibiotics during the postoperative period were distributed among those who use it due to the presence of a foreign body (breast implant: 42.8%; drain tube: 5.8%), those whose indication is based on a non-evidence-based practice (stated as: "for the tranquillity of the surgeon," 31.2%), and finally those who decide to continue with prophylactic antibiotic due to the absence of evidence that supports its suspension during the postoperative period. It might also be noted that this last statement is not completely true, as several studies demonstrated that the use of prophylactic antibiotics during the postoperative period does not correlate with a lower SSI incidence nor capsular contracture rate.[69,71-73] There is even an article concluding that withholding postoperative prophylactic antibiotics in prosthetic breast reconstruction is associated with an increased risk of SSI, reoperation, and thus reconstructive failure.[74]

There is no high-grade evidence supporting the use of prophylactic antibiotics in the postoperative period due to the presence of a breast implant. A survey of the American Society of Breast Surgeons showed that prolonged antibiotic prophylaxis in breast operations requiring drains is common, especially with reconstruction, despite unproven efficacy.[75] However, various approaches on the use of antibiotics while the drain tube is placed were stated. A study by Felippe and colleagues investigated rates of bacterial colonization in surgical drains after mastectomy and found that drain fluid is colonized with bacteria in 33% of drains at 1 week after mastectomy and in 81% by 2 weeks.[76] Another article by Degnim and colleagues demonstrates that bacterial colonization of the drain bulb and subcutaneous drain tubing can be reduced with local, nontoxic antiseptic measures. Their findings also suggest that this might translate into reduced SSI rates.[77] Throckmorton et al retrospectively evaluated 277 patients in whom drains were placed after breast and axillary procedures, of which 158 received preoperative antibiotics only and 119 received both preoperative and postoperative antibiotic prophylaxis. The frequency of SSI was statistically similar between these 2 groups (9.5% versus 8.4%, $P = .76$), suggesting that prolonged postoperative antibiotics do not reduce SSI.[66]

Several facts affect when a primary breast augmentation surgery patient should be discharged. Our survey exposed that 72.2% of the doctors who responded chose to perform outpatient surgery. Trends have globally shifted to this type of procedure as Ballard and colleagues showed in their article based on an analysis of the Tracer Database of the American Board of Plastic Surgeons.[16] During the last years, many concepts regarding anesthesia techniques, intraoperative drugs, surgical techniques, postoperative care, and benefits from an Enhanced Recovery After Surgery protocol have evolved.[78] These factors explain, at least in a major proportion, the reasons for the results obtained in the survey. It must be pointed out the article from Tebbets, published in 2002, might be one of the first descriptions of the critical importance of the execution, in a specific manner, of each step of the primary breast augmentation procedure, beginning from the preoperative consultation towards the postoperative care.[79] In Argentina, another factor may influence the elevated proportion of interventions done on an inpatient basis (almost 1 out of 3 primary breast augmentation surgeries). Some private health insurance plans, in our country, contemplate the possibility of undergoing an aesthetic procedure. Due to the absence of an increased cost (to the patient) for recovery on an inpatient basis, many surgeons and patients might prefer being discharged the day after the surgery.

Pain control management guidelines remain another topic that should be addressed by scientific societies. Interventions such as primary breast augmentation that are being performed on millions of people each year may negatively impact one of the country's biggest health issues, narcotic drug abuse. Although narcotic prescription does not seem to be the first choice for pain management therapy (almost 1 out of 2 surgeons preferred to prescribe regulated nonsteroidal anti-inflammatory drugs [NSAIDs] over NSAIDs and opioids, which were chosen by 34.7% of the participants), an assessment of opioid-prescribing practices published by Crystal and colleagues showed that 91.2% of respondents (from a total of 229 American Society for Aesthetic Plastic Surgery members) prescribe opioids to patients undergoing breast augmentation.[80] Patient education on opioid consumption and well-being in breast augmentation procedures appear as a novel approach to postoperative pain management, not only reducing opioid-related side effects that often lead to suboptimal postsurgical outcomes but also the impact on opioid consumption.[81]

An alternative that reduces analgesic drugs administered during the postoperative period may be the intercostal nerve block as was described by Kang and colleagues, resulting in reducing postoperative pain and shortening time to discharge.[39]

The mobilization of the patient's arms during the postoperative period remains almost without controversy, as 3 out of 4 respondents answered that they indicate gentle mobilization (no elevation above the shoulder) of the patient's arms during the first postoperative week to the patients. Just 10% of the participants agree to promote movements of the patient's arms without restrictions, in terms of body position. This last suggestion is supported by Tebbets's article where he confirmed that, after a detailed breast augmentation surgery protocol, patients are allowed to lift their arms above their heads, lift normal-weight objects, perform all normal activities, and drive their car within 24 hours after surgery.[79] Another author also stated that, during the breast augmentation surgery recovery of his patients, he not only instructed patients to raise their arms over their head beginning 6 to 8 hours after surgery, but also to lie on their breasts for 15 minutes every day, starting the evening of surgery.[82] However, these types of postoperative instructions must be related to a specific breast augmentation surgery protocol that contemplates every period of this intervention (preoperative, intervention *per se*, and postoperative). Likely these recovery instructions may not be possible or adequate to use for any kind of primary breast augmentation surgery.

There is no doubt that the association between BIA-ALCL and textured breast implants has shocked scientific and nonscientific societies. Although the incidence of this disease seems to be quite low, many doubts continue to exist about the exactness of databases of breast implant registries, which may lead to underestimating this problem.[83] This subject is under continuous review as scientific communities work together on behalf of patients' safety. Recall of macro-textured breast implants was performed by Allergan-Biocell, and prohibition of macro-textured breast implants[84] and polyurethane foam-covered breast implants has been informed by the *Agence Nationale de Sécurité du Medicament et de Prosuits de Santé* (ANSM) of France.[85] However, other types of textured implants are not bannedor advised not to be used by plastic surgery

societies or health agencies.[86,87] Our survey showed that 50% of the participants have shifted or tend to prefer using smooth breast implants and 40% of the respondents did not change their practices concerning the BIA-ALCL. The remaining surgeons responded that they are using nano-textured implants instead of other types of textured surface devices. These preferences are different than the ones noted by Sainz-Arregui and Vaquero Perez.[88] In their article, almost 25% of the participants' surgeons from Argentina referred to using smooth breast implants, and in 2018 nearly 75% of them preferred textured implants, which is quite different from the results that we obtained 2 years later. A limitation that we found in the answers to this question in our survey was that from the 40% who did not change their practice due to BIA-ALCL, it does not discriminate between how many of them were using smooth implants and how many decided to continue performing primary breast augmentation with textured implants. More information is currently being gathered, and suggestions from diverse societies or agencies are continually updated. However, there is no prohibition for the use of textured implants in general, as long as BIA-ALCL risks are addressed during the consultation.[86]

Limitations

Limitations of this study may include the variability in surgical practices and postoperative indications among the surveyed surgeons and the time when these surveys were completed. Given the absence of a clinical practice guide for primary breast augmentation, notable divergences in the procedure and postoperative decisions underscore the need for standardization in medical practice. Additionally, the survey relies on responses from active members of the Argentine Society of Plastic Surgery, which could introduce biases to the representativeness of the sample. The lack of correlation between medical evidence and customary medical practices emphasizes the necessity of addressing these discrepancies and providing evidence-based clinical guidance to enhance consistency and quality of care in primary breast augmentation surgery.

Conclusions

Many differences related to each procedural step in primary breast augmentation surgery practice were addressed in our survey. This variability may not lead to an unsafe or wrongly executed intervention but should be the beginning for promoting the creation of practice guidelines that state when, how, and why plastic surgeons should make specific decisions regarding primary breast augmentation.

Acknowledgments

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Ethics: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Disclosures: The authors disclose no relevant financial or nonfinancial interests.

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