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Bletsis, Patrick P.; van der Lei, Berend

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Correspondence and Communications

Antiseptic measures in breast implant surgery: A survey among Dutch plastic surgeons



Dear Sir,

Breast augmentation and reconstruction are among the most frequently performed procedures in plastic surgery. Breast implant infection, capsular contracture (CC) and breast implant associated anaplastic large cell lymphoma (BIA-ALCL) are associated with bacterial contamination. A myriad of antiseptic measures has been proposed throughout the decades, many of which remain subject of discussion as the literature remains inconclusive of their benefits. This may explain the discrepancy in antiseptic measures between Dutch institutions between 2015 and 2019.¹ The most recent guidelines regarding breast implant surgery of the Dutch Association of Plastic Surgeons (NVPC) were published in 2020.² We distributed a survey through the NVPC to identify current trends and discuss antiseptic measures in the Netherlands.

Methods

An online self-made questionnaire was distributed among members of the NVPC on January 23rd 2023 containing seven demographic questions and 12 questions regarding antiseptic measures. The questionnaire was constructed with Qualtrics and closed for responses after two weeks.

Results

Demographic information is shown in [Table 1](#). The response rate was 116 out of 289 (40.1%).

Overall, the median number of antiseptic measures used was 7 (IQR 6-7) out of 9 for surgeons that performed breast augmentations only and both procedures and 7 (IQR 4.5-7) for reconstructions solely. Antiseptic measure data is shown in [Table 2](#).

Discussion

Breast implant surgery remains an important pillar in plastic surgery. Lack of consensus and incoherence regarding

perioperative antiseptic measures is a source of confusion. Some may use more antiseptic measures out of fear for infections, BIA-ALCL and CC.

The Dutch guidelines recommend a single gift of one-gram intravenous cefazoline for procedures shorter than an hour and two grams when longer.² In contrast, breast pocket irrigation or implant immersion with antibiotics is discouraged as it may contribute to antibiotic resistance. A systematic review found a limited clinical benefit of irrigation with antibiotics with regard to infections and CC. However, evidence remains weak since mainly retrospective cohort studies were included.³ Breast envelope and implant irrigation remain another interesting topic of discussion. The guidelines do not discourage irrigation with povidone-iodine as it is cheap and unharmed to patients, even though the literature has been unable to prove significant beneficial effect. Irrigation has even been associated with CC. Both povidone-iodine and chlorhexidine may offer a safe option for disinfection of the skin surrounding the surgical wound.

Minimization of door opening rates and glove change have been standard practice in orthopedic surgery for already considerable time. Door movement is been proven to cause pressure imbalances thereby increasing the probability of surgical site infections (SSI). Outer glove change before implant insertion has been proven to decrease bacterial contamination of the gloves surface; microperforations have been found in 15.8% of gloves after 90 min of operating time.⁴ The Dutch guidelines also recommend minimization of door movement and advise glove change before implant insertion.² Interestingly, all aforementioned antiseptic measures have been implemented for years at our institution but have not decreased SSI rates in alloplastic breast reconstruction. There is no recommendation regarding surgical headwear although it is well-known that head-and-mask coverage decreases airborne transmission of particles. Furthermore, bearded men shed more bacteria as compared to clean-shaven men and females. Beards should therefore be covered at any time in the operation complex.

Nipple shields are hypothesized to create a barrier for commensal bacteria residing in the nipple ducts thus preventing bacterial contamination. Although literature has proven that nipple shields contain bacterial growth, no evidence exists that they reduce infection rates. The article used in the guideline described a single surgeons' experience with reduced CC rates by suturing a heavily soaked povidone-iodine gauze on top of the nipple-areola complex. Again, nationwide guidelines do not oppose the use of nipple shields as it is a cheap and burdenless measure.

Table 1 Demographic information.

| | <i>n</i> | (%) |
|-------------------------------------|----------------|-------|
| Total | 116 | 100.0 |
| Response rate | - | 40.1 |
| Responses | 116 | - |
| Invited (plastic surgeons) | 289 | - |
| Gender | | |
| Male | 71 | 61.2 |
| Female | 45 | 38.8 |
| Experience (in years) (median; IQR) | (12.7; 5-19.8) | |
| Country of residency | | |
| The Netherlands | 109 | 93.7 |
| Belgium | 3 | 2.7 |
| Germany | 3 | 2.7 |
| Israel | 1 | 0.9 |
| Procedure | | |
| Breast augmentation | 21 | 18.1 |
| Breast reconstruction | 13 | 11.2 |
| Both | 82 | 70.7 |
| Breast augmentations (per year) | | |
| < 10 | 35 | 34.0 |
| 10-50 | 43 | 41.7 |
| > 50 | 25 | 24.3 |
| Breast reconstruction (per year) | | |
| < 10 | 18 | 18.9 |
| 10-50 | 63 | 66.3 |
| > 50 | 14 | 14.7 |
| Institution type | | |
| Teaching hospital | 5 | 4.3 |
| General hospital | 47 | 40.5 |
| Private practice | 23 | 19.8 |
| Hospital + private practice | 41 | 35.2 |

Finally, the guidelines advise to consider the use of a sleeve to prevent contact of the implant with surrounding skin.² A large retrospective study did find a 54% reduction in the CC rate when using a sleeve as compared to regular implant insertion without a sleeve.⁵

Clinicians and researchers strive for continuous improvement of medical practice and patient outcomes. We believe it is essential to evaluate practice and take evidence-based decisions. Understandably, we sometimes integrate measures in daily routines which are not (yet) supported by literature. One may question why we continue implementing measures with such weak evidence. The incidence of infection-related revisions in the Netherlands is very low, 0.1% in augmentation and 2.1% in reconstruction.¹ This highlights the importance of large perhaps European initiated randomized trials.

Conclusion

Dutch plastic surgeons use an abundance of measures meant to reduce bacterial contamination when using breast implants. However, the majority of applied measures remain disputable because of limited evidence in the literature. Therefore, randomized studies should be undertaken to evaluate the true value of these measures.

Table 2 Antiseptic measures and irrigation substances.

| | (n) | (%) |
|-----------------------------|-----|------|
| Preoperative antibiotics | | |
| Yes | 112 | 96.6 |
| No | 4 | 3.4 |
| Pocket irrigation | | |
| Yes | 99 | 85.3 |
| PI | 74 | 74.7 |
| AB | 12 | 12.1 |
| Other | 13 | 13.2 |
| No | 4 | 14.7 |
| Implant irrigation | | |
| Yes | 98 | 84.5 |
| PI | 65 | 66.3 |
| AB | 18 | 18.4 |
| Other | 15 | 15.3 |
| No | 18 | 15.5 |
| Skin disinfection | | |
| Yes | 110 | 94.8 |
| PI | 68 | 61.8 |
| Chlorhexidine | 34 | 30.9 |
| Other | 8 | 7.3 |
| No | 6 | 5.2 |
| Sleeve/funnel | | |
| Yes | 20 | 17.2 |
| No | 96 | 82.8 |
| Nipple shield | | |
| Yes | 97 | 83.6 |
| No | 19 | 16.4 |
| Glove change | | |
| Yes | 98 | 84.5 |
| No | 18 | 15.5 |
| Door movement minimization | | |
| Yes | 111 | 95.7 |
| No | 5 | 4.3 |
| Head cover | | |
| Surgical cap | 103 | 88.8 |
| Surgical hood + beard cover | 13 | 11.2 |

PI: povidone-iodine; AB: antibiotic.

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Ethical approval

The patient information in this study was collected by the authors and de-identified. The study was approved by the Medical Ethical Commission of the University Medical Center Groningen (UMCG).

CRediT authorship contribution statement

1) substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; 2) drafting the article or revising it critically for important intellectual content; 3) final approval of the version to be published; 4) Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Patrick P. Bletsis
*Department of Plastic and Reconstructive Surgery,
University Medical Center Groningen, University of
Groningen, Groningen, the Netherlands*

Berend van der Lei *
*Department of Plastic and Reconstructive Surgery,
University Medical Center Groningen, University of
Groningen, Groningen, the Netherlands
Bey by Bergman Clinics, Heerenveen, Hilversum and
Zwolle, the Netherlands*

E-mail address:
b.van.der.lei@umcg.nl (B. van der Lei).

*Correspondence to: University Medical Center Groningen,
University of Groningen, Hanzeplein 1, P.O. Box 30001, 9700
RB Groningen, the Netherlands.

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