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Systematic Review

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Safety of Hyaluronic Acid and Botulinum Toxin Aesthetic Treatment Among Breast Cancer Patients

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Abstract

Background: Aesthetic and functional consequences of cancer treatments often affect the quality of life and self-image of breast cancer survivors. Increasingly, patients seek nonsurgical aesthetic procedures such as hyaluronic acid (HA) fillers and botulinum toxin type A (BTX-A) treatments. However, evidence regarding the safety of these procedures in this population is limited.

Methods: We conducted a systematic literature review to evaluate the safety and efficacy of facial aesthetic treatments using HA fillers and BTX-A in breast cancer patients. Articles involving oncologic populations and aesthetic procedures were identified through major medical databases.

Results: The search revealed scarce data on facial aesthetic treatments in breast cancer survivors. Only one post-marketing study addressed aesthetic treatments in this population, reporting favorable safety outcomes in nine breast cancer patients undergoing HA filler and BTX-A treatment after completing chemotherapy. Additional literature focused on other oncological applications of BTX-A, such as pain and spasticity management, confirming its safety profile. Although HA has been used in reconstructive and supportive oncology care, few complications were noted when administered outside periods of active oncologic treatment.

Conclusion: The use of BTX-A and HA for facial aesthetic purposes appears safe in breast cancer patients who have completed chemotherapy and radiotherapy at least six months prior, provided their general health is stable. There is insufficient evidence to recommend these treatments during ongoing systemic therapies. As survivorship care increasingly prioritizes body image and quality of life, further research is warranted to establish evidence-based guidelines in onco-aesthetic medicine.

Keywords: Breast cancer, Botulinum toxin, Hyaluronic acid, Aesthetic medicine, Survivorship, Safety

Introduction

Cancer treatments result in aesthetic and functional consequences. It is common for breast cancer patients to request nonsurgical aesthetic medicine treatments, but we do not have high-quality evidence on which base aesthetic treatments. Furthermore, maintenance treatments are becoming increasingly common in this population, and we need to know the necessary conditions to proceed with the aesthetic treatments.

In this article, we conducted a systematic review of the bibliography to evaluate the safety and efficacy of facial aesthetic hyaluronic acid fillers -HA and botulinum toxin –BTX in patients with breast cancer.

Materials and Methods

A systematic literature review was conducted to assess the safety and efficacy of facial aesthetic treatments using hyaluronic acid (HA) fillers and botulinum toxin type A (BTX-A) in breast cancer patients. The review followed a structured search strategy across major medical databases, including PubMed, Scopus, and Web of Science, up to November 2024.

We used the following combinations of keywords: “breast cancer,” “aesthetic medicine,” “botulinum toxin,” “hyaluronic acid,” “dermal fillers,” “safety,” and “oncologic patients.” Articles were selected if they met the following inclusion criteria:

1. Studies involving breast cancer patients undergoing HA or BTX-A treatments.

2. Publications addressing safety, adverse events, or clinical outcomes related to these procedures in oncologic populations.

3. Original studies, systematic reviews, case series, and case reports published in peer-reviewed journals.

Studies focusing exclusively on reconstructive surgical procedures, animal models, or non-oncologic populations were excluded.

Two authors independently screened titles and abstracts, and any discrepancies were resolved through discussion with a third reviewer. Full-text articles were then evaluated for eligibility. Data extraction included information on study design, patient characteristics, type and timing of aesthetic procedures, safety outcomes, and reported adverse events. The results were synthesized narratively due to the heterogeneity and limited number of studies.

This review adheres to the ethical standards of scientific research and does not involve new human or animal studies conducted by the authors and adheres to the PRISMA 2020 reporting guidelines for systematic reviews.

Results

The search yielded several reviews on the use of botulinum toxin in oncology patients, preclinical studies, and some published cases with hyaluronic acid fillers (Figure 1). However, there was only one publication related to aesthetic purposes in breast cancer.

This post-marketing study conducted by Dr. Shamban[1] included 10 patients who had undergone previous chemotherapy more than 6 months ago. Nine patients had breast cancer, and one had Hodgkin’s lymphoma. One patient lost to follow-up. Efficacy was assessed at week 2 after the administration of the filler (RestylaneTM) and Abobotulinumtoxin A (DysportTM) in the glabella and was maintained at week 8 with a reduction of at least 2 points on the wrinkle severity assessment score (WSAS).

In all cases, patients reported satisfaction with the received treatment. There were no serious adverse reactions, nor different reactions to those expected. Mild local side effects lasted between 2 hours and 1.5 days.

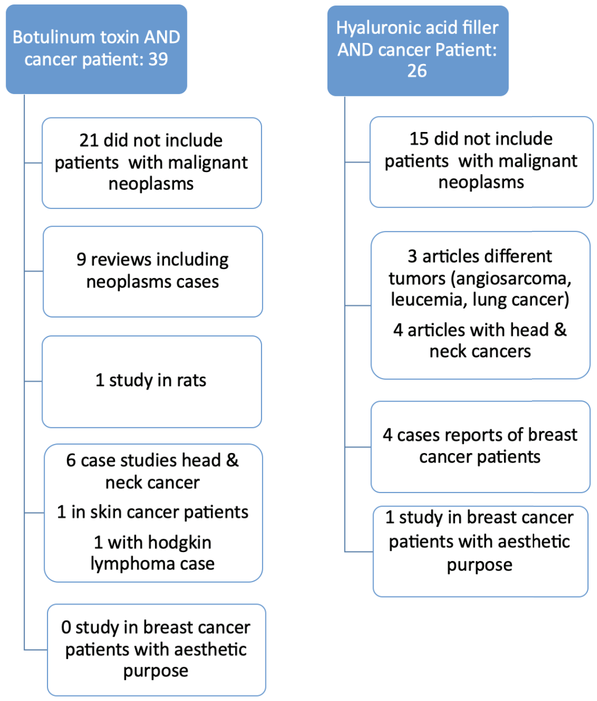

Figure 1: Flow chart of bibliographic search outcomes

None of the articles on breast cancer patients included facial treatments.

The bibliography about safety in cancer patients is primarily derived from limited clinical trials with applications other than facial aesthetics. Therefore, in the absence of specific studies, we could extrapolate safety data but not efficacy.

In 2022, Gil Parra et al published a review (including randomized trials, observational studies, and clinical cases) about the applications of botulinum toxin in oncology patients.[2] They selected a total of 24 articles, however, only eight were conducted on patients (five studies, 3 case reports), and none of them had aesthetic purposes. These studies evaluated the effect of botulinum toxin in managing pain or muscular spasticity in cancer patients: only two studies were performed in breast cancer patients, one by Layeque[3] and the other by Zikiryakhodzhaev.[4] The authors confirm the safety of botulinum toxin and the low risk of interactions with other medications.

Proietti et al. published a review in 2021 about aesthetic treatments in cancer patients.[5] They discuss the uses of implants for aesthetic and reconstructive purposes, the latter of which is beyond the scope of this work. Nonetheless, we can draw conclusions from both. The first point they addressed was the reason why oncological patients are considered “fragile” and how the consequences of oncological therapies may influence the types of complications that may arise in this context.

Factors that affect the assimilation and integration of the aesthetic product within the organism are the underlying oncologic disease which already characterizes a fragile patient the immunosuppression associated with neoplasia, systemic and radiotherapy treatments, and the stress of the oncological process itself. These factors lead to an alteration of immunity by increasing pro-inflammatory cytokines and glucocorticoid levels, as well as inhibiting cellular and antibody-mediated immunity, including natural killer (NK) cell activity.[6] This results in an elevated risk of viral, bacterial, and fungal infections,[7] along with skin alterations characterized by decreased sebum content and trans-epidermal water loss.[8]

Pikkel[9] described a case of dermal filler cannula rupture for the treatment of the décolleté area in a breast cancer patient who had received radiation therapy.

1- Hyaluronic acid:

In cancer patients, it has been used for reconstructing volumes to project the nipple after a simple mastectomy,[10] and to prevent radiation therapy toxicity,[11] although it is more expensive and not more effective than externally applied creams.

Regarding the safety of hyaluronic acid in oncology patients, it is secure and does not result in a higher risk of complications compared to patients without a cancer history, although there are described some cases of complications with oncology treatments administered shortly after the filler injection. Pathmanathan,[12] describes a patient case with an inflammatory reaction to hyaluronic acid filler placed 6 months before the treatment with cetuximab for head and neck cancer.

Contraindications of fillers:

Patients with poor performance status, undergoing active chemotherapy, or with severe active illness, without permission/ consent from their oncologist. Patients who have received bisphosphonate therapy may experience serious adverse effects with bone interventions, but these are not relevant in the facial region in aesthetic medicine. Granulomatous reactions, occurring in less than 0.3% of filler injection cases, can be influenced by immunotherapy drugs, as described in three cases of patients who experienced inflammatory complications from permanent fillers after receiving immunotherapy even up to 25 years after filler injection[13,14,15] and after COVID vaccination.[16]

2- Botulinum toxin:

The most commonly used toxin is botulinum toxin type A, both for indications according to the product's technical specifications and for "off-label" uses, given its utility in managing various conditions beyond aesthetics (pain, muscle spasticity, migraines, hyperhidrosis, skin lesions).[17]

The action of botulinum toxin takes about 2-4 days to appear and lasts on average 12 weeks, depending on factors such as gender, physical activity, dosage, and frequency of toxin administration.[18]

The available literature on the use of botulinum toxin in oncology patients includes cases involving breast cancer patients (as mentioned previously), patients with head and neck, or esophageal cancer aiming to achieve pain management, xerostomia, or spasticity control. Two randomized studies failed to demonstrate pain management benefits alongside physical therapy. However, there is evidence in patients with head and neck cancer for the treatment of muscular disorders.[19,20] Only Shamban, in her 2014 article, references aesthetic use.

In terms of safety, botulinum toxin is a secure drug. In cancer patients, has not shown a different adverse effects profile compared to its known applications.

Botulinum toxin resistance:

Primary resistance to botulinum toxin (ineffectiveness after the first injection) occurs in 9% of patients. Secondary resistance occurs in 7.5%. This is related to high doses of toxin administered at shorter intervals, and serological detection of antibodies in these cases. While not very sensitive (56%), this detection is very specific (99.6%).[21] Monoclonal antibodies, widely used in cancer treatment, induce the activation of B-lymphocytes and plasma cells. This may cause cross-reactivity with the proteins of botulinum toxin. The toxin is contraindicated in cases of myasthenia gravis and neuromuscular diseases; therefore, caution is advised in cases of thymoma, where myasthenia gravis is the most common paraneoplastic syndrome.

Ansiaux et al[22] demonstrated in 2006 in a study with mice that the injection of botulinum toxin type A into mouse tumors caused vasodilation, sensitizing the lesion to the effects of radiotherapy. However, no subsequent studies have confirmed this finding, and it has not progressed to clinical trials.

Discussion

Comprehensive care of cancer patients should encompass both the direct effects stemming from the cancer treatments and the indirect effects, such as physical recovery, reintegration into the workforce, management of depression associated with the disease, and the recovery and acceptance of changes in body image. In cancer survivors, after disease recurrence, financial issues and changes in their body are the most important concerns. This type of care requires a multidisciplinary and gradual approach, adapted to the evolving needs of the patient over the course of their follow-up.

The team of professionals involved throughout the journey of a breast cancer patient includes oncologists, surgeons, radiation oncologists, pathologists, and radiologists, as well as rehabilitation specialists, physiotherapists, psychologists, dermatologists, and aesthetic physicians. Bianchi et al. coined the term 'onco-aesthetics', referring to the specialized field that integrates aesthetic interventions into cancer care to improve psychological well-being.[23]

The use of aesthetic medicine is becoming increasingly common among cancer survivors, who seek to regain control over their image and identity. However, this topic is often undervalued in both clinical settings and research agendas, despite its relevance to survivorship care.

The literature on the safety and toxicity of aesthetic treatments in patients with breast cancer and oncology patients is limited. As mentioned in Douglas's article, in certain areas of medicine, obtaining level 1 evidence (meta-analyses and double-blind randomized clinical trials) can be challenging. Yet, essential knowledge can be derived from the extensive existing experience, which will guide us in providing the best treatment to the patient, rather than leaving them without appropriate care.[23]

In our review, we have discovered level 3 evidence regarding the toxicity and efficacy of botulinum toxin and hyaluronic acid used in aesthetic medicine for breast cancer patients. The use of these treatments does not result in adverse effects that differ significantly from the expected outcomes in general.

Based on our findings, we propose that the treatment of expression lines with botulinum toxin and skin restructuring/ volumization with hyaluronic acid products can be safely considered for oncology patients after 6 or more months since the completion of systemic therapies (chemotherapy, targeted therapy, or immunotherapy) and radiotherapy.

There are no published data on these treatments in patients undergoing active hormonal therapy. However, based on their mechanisms of action, it is unlikely that there would be interactions.

For patients who have overcome breast cancer but are still undergoing maintenance therapy with immunotherapy or targeted therapies, there is currently no safety data available. Some inflammatory reactions associated with immunotherapy have been reported. Therefore, our recommendation is to avoid aesthetic medicine treatments until there is evidence regarding their safety or until the treatment has been completed. Of course, the patient has not to have any general contraindications for those treatments and be in a general good performance status.

One limitation of this review is that it focuses on facial fillers with hyaluronic acid and botulinum toxin treatments, as they are the most widely used worldwide. Other treatments such as energy-based devices are not considered due to the need to limit the scope of the study.

Clinical implications and future directions

The integration of aesthetic medicine into cancer survivorship care presents a promising frontier for improving patients' quality of life. Although evidence remains limited, particularly in breast cancer patients seeking facial rejuvenation treatments, the preliminary data suggest that hyaluronic acid fillers and botulinum toxin type A may be used safely after completion of active oncologic treatments.

In clinical practice, aesthetic physicians and oncologists should collaborate to define appropriate windows for intervention, ideally six months or more after chemotherapy and radiotherapy, and only in patients with stable general health. Furthermore, informed consent must address the lack of high-level evidence and the potential albeit low risk of immune-related adverse effects, particularly in patients under maintenance immunotherapy.

Future studies should aim to generate prospective clinical data, define standard protocols, and stratify risk by treatment history. Building a robust evidence base in onco-aesthetics will ensure that aesthetic interventions in cancer survivors are both effective and safe, ultimately contributing to holistic, patient-centered care.

Conclusions

Facial aesthetic treatments using botulinum toxin type A and hyaluronic acid fillers appear to be safe for breast cancer patients who have completed their chemotherapy and radiotherapy treatments at least six months earlier and are in stable general health. These procedures should be avoided in patients undergoing active systemic therapies, including immunotherapy and targeted treatments, until further evidence becomes available.

Given the rising survival rates and evolving priorities in cancer survivorship care, aesthetic medicine represents a valuable tool for improving quality of life and body image in this population. Further prospective studies are warranted to establish evidence-based guidelines for safe and effective aesthetic interventions in breast cancer survivors.

This article does not contain any studies with human participants or animals per-formed by any of the authors.

For this type of study informed consent is not required.

Author Contributions:

Dr. Magda Palka-Kotlowska contributed to the conception, design, and drafting of the work, acquisition and treatment of the patient.

Dr Luis Cabezón and Magda Palka-Kotlowska ensured that questions related to the accuracy or integrity of any part of the work were appropriately investigated and resolved.

Dr Sara Custodio-Cabello, Eduardo Oliveros-Acebes, Emilce Insua-Nipoti, Beatriz Chacón-Ovejero and Vilma Pacheco-Barcia helped to the conception and design of the work, drafting and reviewing it critically for important intellectual content.

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Conflict of Interest:

The authors declare that they have no conflicts of interest to disclose.

Luis Cabezón Gutiérrez declares the following conflicts of interest: Advisory role; Astra Zeneca, Roche, Eisai and Brystol Myers Squibb. Speakers' bureau; Roche, Astra Zeneca, Brystol Myers Squibb, Merck Serono, Grunenthal, Pfizer, Roche and Eisai.

Magda Palka Kotlowska: declares advisory role for Glaxo Smith Kline and Esteve. Speakers' bureau; Pfizer, Gilead, Daiichi Sankyo, Glaxo Smith Kline, Astra Zeneca and Novartis, Sara Custodio Cabello: declares speakers' bureau; Fresenius, Abbot, Astelas.

Vilma Pacheco Barcia declares Advisory role: Advanced accelerator applications, a Novartis company. Speakers' bureau: Merck, Eli Lilly, Eisai, Pierre Fabre. Congress attendance: Merck, Amgen, Merck Sharp and Dhome, Nutricia. Grant support: FSEOM and Merck. Other: Amgen. Eduardo Oliveros Acebes, Beatriz Chacón-Ovejero and Emilce Insua-Nipoti declares no conflicts of interest.

References

1. Shamban A. Safety and Efficacy of Facial Rejuvenation with Small Gel Particle Hyaluronic Acid with Lidocaine and AbobotulinumtoxinA in Post-Chemotherapy Patients: A Phase IV Investigator-initiated Study. *The Journal of clinical and aesthetic dermatology*. 2014;7(1):31–36. PMID: https://pmc.ncbi.nlm.nih.gov/articles/PMC3930538/
2. Gil-Parra T, Tejero-García P. Tratamiento con toxina botulínica en pacientes oncológicos. *Medicina Estética*. 2022;Nº 73:4ºT. doi: https://doi.org/10.48158/MedicinaEstetica.073.04
3. Layeeque R, Hochberg J, Siegel E, *et al*. Botulinum toxin infiltration for pain control after mastectomy and expander reconstruction. *Annals of Surgery*. 2004;240(4):608–614. doi: https://doi.org/10.1097/01.sla.0000141156.56314.1f
4. Zikiryakhodzhaev AD, Alekseeva GS, Reshetov IV, *et al*. Botulinum Toxin Type A as a Tool for Correcting Capsular Contracture after Reconstructive Breast Surgery. *Plastic and Reconstructive Surgery*. Global open. 2021;9(1):e3372. doi: https://doi.org/10.1097/GOX.0000000000003372
5. Proietti I, Skroza N, Mambrin A, *et al*. Aesthetic Treatments in Cancer Patients. *Clinical, Cosmetic and Investigational Dermatology*. 2021;14:1831–1837. doi: https://doi.org/10.2147/CCID.S342734
6. Antoni MH, Dhabhar FS. The impact of psychosocial stress and stress management on immune responses in patients

with cancer. *Cancer*. 2019;125(9):1417–1431. doi: https://doi.org/10.1002/cncr.31943
7. Hu SC, Hou MF, Luo KH, *et al*. Changes in biophysical properties of the skin following radiotherapy for breast cancer. *The Journal of Dermatology*. 2014;41(12):1087–1094. doi: https://doi.org/10.1111/1346-8138.12669
8. Kang D, Kim IR, Im YH, *et al*. Quantitative changes in skin composition parameters due to chemotherapy in breast cancer patients: a cohort study. *Breast Cancer Research and Treatment*. 2015;152(3):675–682. https://doi.org/10.1007/s10549-015-3502-4
9. Pikkel YY, Zeltzer AA. Broken Dermal Filler Cannula in Post-Radiated Décolleté. *Aesthetic Plastic Surgery*. 2023;47(Suppl 1):196–197. doi: https://doi.org/10.1007/s00266-022-03198-7
10. Sue GR, Seither JG, Nguyen DH. Use of hyaluronic acid filler for enhancement of nipple projection following breast reconstruction: An easy and effective technique. *JPRAS Open*. 2019;23:19–25. doi: https://doi.org/10.1016/j.jpra.2019.10.003
11. Tai RZ, Loh EW, Tsai JT, Tam KW. Effect of hyaluronic acid on radiotherapy-induced mucocutaneous side effects: a meta-analysis of randomized controlled trials. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*. 2022;30(6):4845–4855. doi: https://doi.org/10.1007/s00520-022-06902-0
12. Pathmanathan S, Dzienis M. Cetuximab associated dermal filler reaction. *BMJ Case Reports*. 2019;12(8):e228882. doi: https://doi.org/10.1136/bcr-2018-228882
13. Dhaliwal P, Ibad S, Losak D, Cockerell C. A Case of Granulomatous Hypersensitivity Reactions to a Dermal Filler Precipitated by PD-1 Checkpoint Inhibitor Therapy. *SKIN The Journal of Cutaneous Medicine*. 2021;5(1):41–45. doi: https://doi.org/10.25251/skin.5.1.10
14. Syunyaeva Z, Kahnert K, Kauffmann-Guerrero D, *et al*. Dermal Filler Injections Mimic Tumor Activity during Immune Checkpoint Inhibition. *Respiration; international review of thoracic diseases*. 2018;95(5):362–363. doi: https://doi.org/10.1159/000487601
15. Bisschop C, Bruijn MS, Stenekes MW, *et al*. Foreign body reaction triggered by cytotoxic T lymphocyte-associated protein 4 blockade 25 years after dermal filler injection. *The British journal of dermatology*. 2016;175(6):1351–1353. doi: https://doi.org/10.1111/bjd.14674
16. Kalantari Y, Aryanian Z, Mirahmadi SM, *et al*. A systematic review on COVID-19 vaccination and cosmetic filler reactions: A focus on case studies and original articles. *Journal of cosmetic dermatology*. 2022;21(7):10.1111/jocd.15071. doi: https://doi.org/10.1111/jocd.15071
17. Zhou K, Luo W, Liu T, *et al*. Neurotoxins Acting at Synaptic Sites: A Brief Review on Mechanisms and Clinical Applications. *Toxins*. 2022;15(1):18. doi: https://doi.org/10.3390/toxins15010018
18. Jankovic J. Botulinum toxin: State of the art. *Movement disorders : official journal of the Movement Disorder Society*. 2017;32(8):1131–1138. doi: https://doi.org/10.1002/mds.27072
19. Laskawi R, Ellies M. The role of botulinum toxin in the management of head and neck cancer patients. *Current opinion in otolaryngology & head and neck surgery*. 2007;15(2):112–116. doi: https://doi.org/10.1097/MOO.0b013e328014731c
20. Shaw L, Bazzell AF, Dains JE. Botulinum Toxin for Side-Effect Management and Prevention of Surgical Complications in Patients Treated for Head and Neck Cancers and Esophageal Cancer. *Journal of the advanced practitioner in oncology*. 2019;10(1):40–52. PMID: https://pmc.ncbi.nlm.nih.gov/articles/PMC6605704/
21. Mathevon L, Declemy A, Laffont I, Perennou D. Immunogenicity induced by botulinum toxin injections for limb spasticity: A systematic review. *Annals of physical and rehabilitation medicine*. 2019;62(4):241–251. https://doi.org/10.1016/j.rehab.2019.03.004
22. Ansiaux R, Baudelet C, Cron GO, *et al*. Botulinum toxin potentiates cancer radiotherapy and chemotherapy. *Clinical cancer research: an official journal of the American Association for Cancer Research*. 2006;12(4):1276–1283. doi: https://doi.org/10.1158/1078-0432.CCR-05-1222
23. Douglas J. Evidence-based practice or practice-based evidence? Why pursuing level 1 evidence is leaving lymphoedema behind. *Journal of Lymphoedema*. 2022;17(1):8-11. https://lymphoedemaeducation.com.au/wp-content/uploads/2022/09/2-evidence-based-practice-practice-based-evidence-why-pursuing-level-1-evidence-leaving-lymphoedema-behind.pdf