Review Article

Hyper-Realistic Nipple-Areola Complex Prostheses in Breast Reconstruction: A Patient-Centered Approach

Próteses Hiper-Realistas do Complexo Aréolo-Mamilar na Reconstrução Mamária: Uma Abordagem Centrada no Paciente

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ABSTRACT

Breast reconstruction following mastectomy or congenital absence has evolved significantly, with increasing emphasis on aesthetic outcomes and patient-centered care. While restoration of breast volume is often achieved through surgical techniques, reconstruction of the nipple-areola complex remains a challenging step and is essential for achieving anatomical and psychosocial completeness. Surgical approaches are associated with variable outcomes and may not be suitable or desirable for all patients. This article presents a narrative review supported by illustrative clinical cases, evaluating the role of nipple-areola complex prostheses as a non-surgical option within the reconstructive algorithm. Two clinical scenarios are described: a patient with Poland syndrome and congenital breast agenesis, and a patient following mastectomy for breast cancer. In both cases, prosthetic reconstruction provided satisfactory aesthetic results and improved body image. These prostheses represent a safe, reversible, and minimally invasive alternative, particularly relevant for patients who are not candidates for further surgery or who decline additional procedures. Their use supports

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patient-centered care and shared decision-making, enabling individualized reconstructive strategies. They should be considered a complementary, and in selected cases primary, option within breast reconstruction.

Keywords: Breast Neoplasms/surgery; Mammaplasty; Nipples; Patient Satisfaction; Prostheses and Implants; Prosthesis Design; Silicones

RESUMO

A reconstrução mamária após mastectomia ou ausência congênita evoluiu significativamente, com crescente ênfase nos resultados estéticos e no cuidado centrado no paciente. Embora a restauração do volume mamário seja frequentemente alcançada por meio de técnicas cirúrgicas, a reconstrução do complexo aréolo-mamilar permanece uma etapa desafiadora e essencial para atingir a integridade anatômica e psicossocial. As abordagens cirúrgicas estão associadas a resultados variáveis e podem não ser adequadas ou desejáveis para todas as pacientes. Este artigo apresenta uma revisão narrativa, apoiada por casos clínicos ilustrativos, avaliando o papel das próteses do complexo aréolo-mamilar como uma opção não cirúrgica dentro do algoritmo reconstrutivo. Dois cenários clínicos são descritos: uma paciente com síndrome de Poland e agenesia mamária congênita, e uma paciente submetida à mastectomia por câncer de mama. Em ambos os casos, a reconstrução protética proporcionou resultados estéticos satisfatórios e melhorou a autoimagem. Essas próteses representam uma alternativa segura, reversível e minimamente invasiva, particularmente relevante para pacientes que não são candidatas a novas cirurgias ou que recusam procedimentos adicionais. Seu uso apoia o cuidado centrado no paciente e a tomada de decisão compartilhada, possibilitando estratégias reconstrutivas individualizadas. Devem ser consideradas uma opção complementar e, em casos selecionados, primária, na reconstrução mamária.

Palavras-chave: Desenho de Prótese; Mamoplastia; Mamilos; Neoplasias da Mama/cirurgia; Próteses e Implantes; Satisfação do Doente; Silicones

INTRODUCTION

Breast reconstruction following mastectomy or congenital absence has evolved significantly over recent decades, with increasing emphasis on surgical refinement and patient-reported outcomes.[1] While restoration of breast volume is often achievable through implant-based or autologous techniques, complete anatomical reconstruction may remain incomplete without the nipple-areola complex (NAC).

Anaplastology is a medical discipline focused on the design and fabrication of external prostheses aimed at replacing absent or deformed anatomical structures resulting from trauma, disease, or congenital conditions. These prostheses are intended to be realistic, functional, and aesthetically harmonious, while being tailored to individual patient needs and preferences.[2,3]

This article presents a narrative review supported by illustrative clinical cases, aiming to highlight the clinical applicability, patient-centered value, and psychosocial impact of hyper-realistic NAC prostheses as a non-surgical strategy in breast reconstruction.

CLINICAL APPLICATIONS

Two clinical scenarios illustrate the applicability of hyper-realistic NAC prostheses in distinct reconstructive contexts.

The first case involves a 16-year-old female patient with Poland syndrome associated with congenital breast agenesis, previously treated with implant-based reconstruction. Despite satisfactory restoration of breast volume, the absence of the NAC remained a relevant aesthetic concern. A custom NAC prosthesis was proposed, resulting in high patient satisfaction and improved body image (Fig. 1).

The second case concerns a 69-year-old patient who underwent unilateral mastectomy for breast cancer, followed by implant-based reconstruction. The patient declined additional surgical procedures, including nipple reconstruction. A prosthetic NAC solution was therefore offered, resulting in high patient satisfaction and improved self-esteem (Figs. 2 and 3).

NAC prostheses represent a non-surgical reconstructive option that may be considered in patients for whom surgical reconstruction is not indicated or not desired.[4,5] These



Figure 1: Hyper-realistic silicone nipple–areola complex prosthesis prior to application, demonstrating colour, surface texture, and three-dimensional projection.

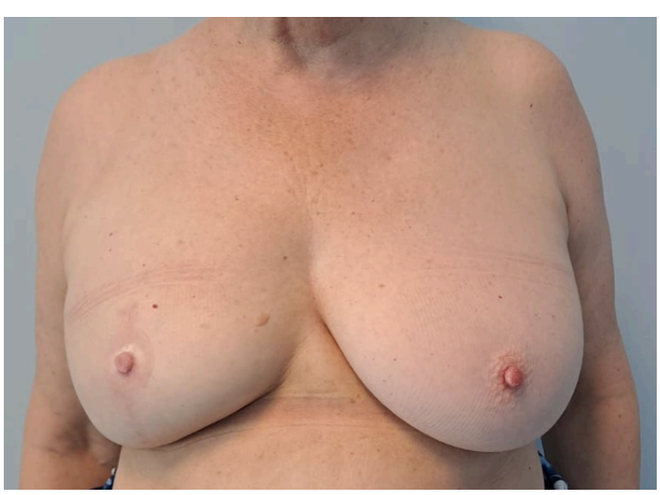


Figure 2: Clinical application of the nipple–areola complex prosthesis *in situ*, on the right breast, demonstrating symmetry and aesthetic integration with the contralateral nipple–areola complex.

prostheses are typically hyper-realistic, three-dimensional devices that may be custom-made to match the contralateral NAC or selected from prefabricated options available in different shapes, textures, and pigmentation patterns.[2,3,5,6] They are generally applied using a hypoallergenic medical-grade adhesive, allowing secure fixation with ease of application and removal.



Figure 3: Lateral view of the nipple–areola complex prosthesis in situ on the right breast following implant-based reconstruction, demonstrating three-dimensional projection and contour integration.

These cases illustrate the role of NAC prostheses in addressing unmet reconstructive needs, particularly in patients for whom surgical reconstruction is either not feasible or not desired.

PSYCHOLOGICAL IMPACT

Restoration of the nipple-areola complex represents a critical step in achieving a sense of completeness following breast reconstruction. Its absence may contribute to persistent dissatisfaction, even in technically successful surgical outcomes.[1]

Hyper-realistic NAC prostheses offer an effective means of restoring visual symmetry and anatomical integrity, positively influencing body image and emotional recovery. Patients frequently report increased confidence and improved comfort in both social and intimate settings.[2,5]

Beyond aesthetic restoration, these devices contribute to the re-establishment of body image and symmetry, with a positive impact on self-esteem and psychological well-being.[2,5] This form of rehabilitation may play a meaningful role in empowering patients throughout their breast cancer recovery journey, supporting both physical and emotional adaptation.

Importantly, these devices support a patient-centered approach by respecting individual preferences and providing a non-invasive, reversible alternative.

DISCUSSION

Despite significant advances in breast reconstruction techniques, restoration of the NAC remains a challenging step, often associated with variable aesthetic outcomes. Surgical approaches, including local flaps and tattooing, may result in loss of projection over time, asymmetry, and the need for secondary procedures.[1] Furthermore, not all patients are suitable candidates for additional surgery, and some may decline further operative intervention after initial reconstruction.[4,5]

In this context, hyper-realistic NAC prostheses represent a valuable adjunct or alternative within the reconstructive algorithm. Their non-invasive nature, reversibility, and high degree of aesthetic realism make them particularly suitable for patients who are either medically unfit for surgery or who prefer to avoid further procedures. Importantly, these devices provide immediate aesthetic completion without the morbidity associated with surgical intervention.

The clinical cases presented illustrate distinct but complementary indications: one involving congenital breast absence and another following oncologic resection. In both scenarios, prosthetic NAC reconstruction addressed residual aesthetic concerns that persisted despite adequate restoration of breast volume, highlighting the importance of NAC reconstruction in achieving a sense of completeness.

From a contemporary surgical perspective, the integration of NAC prostheses aligns with the principles of patient-centered care and shared decision-making. These devices allow for individualized reconstruction strategies tailored to patient preferences, expectations, and clinical circumstances. Their reversible nature also enables patients to defer or reconsider surgical reconstruction without compromising future options.

Beyond aesthetic considerations, NAC prostheses may contribute significantly to psychosocial recovery, improving body image, self-confidence, and overall quality of life. These outcomes are particularly relevant in breast cancer survivors, in whom reconstruction plays a central role in long-term rehabilitation.

Despite these advantages, NAC prostheses remain underutilized in routine clinical practice. This may reflect limited awareness among healthcare professionals and insufficient incorporation into standard reconstructive pathways. Increasing recognition of anaplastology as a complementary discipline may facilitate a more multidisciplinary approach and expand the range of available reconstructive options.

Rather than being viewed solely as a secondary alternative, NAC prostheses should be considered a complementary reconstructive modality and, in selected cases, a potential primary option. Their inclusion within the reconstructive algorithm may enhance patient satisfaction while supporting less invasive and more adaptable approaches to care.

One limitation of this work is the absence of quantitative outcome measures however, its primary objective is to highlight clinical applicability and patient-centered perspectives.

CONCLUSION

Hyper-realistic silicone NAC prostheses represent a safe, effective, and patient-centered non-surgical option in breast reconstruction.

They should be considered as part of the reconstructive algorithm, particularly in patients who are not candidates for further surgery or who decline additional procedures. Their use contributes not only to aesthetic completion but also to improved patient satisfaction and psychosocial well-being.

As reconstructive care continues to evolve toward more individualized and patient-driven approaches, NAC prostheses should be recognized as an integral component of comprehensive breast reconstruction strategies.

ETHICAL DISCLOSURES

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