

Tattooing of Greenish Areolar Post-Necrotic Scar Tissue after Breast Cancer Surgery: A Nursing Case Report

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Case Report

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Abstract

Background

The long-term residual changes to the nipple-areola complex (NAC) following nipple-sparing mastectomy are most frequently reported as hypopigmentation or a pigment disorder related to scarring. Despite successful oncological and reconstructive treatment, these sequelae can persist and continue to affect patients' perception of their bodily integrity. NAC medical tattooing has been described as a method for concealing scars, discolouration, and pigment loss. However, persistent greenish or grey post-ischaemic areolar discolouration has not been clearly documented as a typical long-term NAC outcome. This paper reports on a stepwise chromatic correction, led by nurses, of an uncommon, stable greenish post-necrotic areolar scar.

Case presentation

A 50-year-old woman underwent NAC-sparing mastectomy with a pedunculated flap following a breast cancer diagnosis. Superficial NAC ischaemia was noted during the initial follow-up visits. Although it was promptly treated with enoxaparin and dressings, a loss of substance was observed in the lower section of the NAC. This was treated with an antimicrobial wound dressing until complete healing was achieved. Although the reconstructive process was successfully completed, the difficult healing process resulted in areas of hypopigmentation and a greenish/grey discolouration. In February 2026, the patient was referred to the ARCADE nurse-led NAC tattooing clinic of the Plastic Surgery Service of the Health Local Authority of Reggio Emilia (Italy). The aim was to neutralise the green/grey colour and make the entire areola uniform by reproducing the original colour. During the initial session, the specialist nurse used a dermograph with a sterile needle and bioabsorbable pigments to apply a pure orange corrector to neutralise the greenish colour. The subsequent two sessions, 30–40 days apart, aimed to harmonise the colour using a graduated approach with rose and brown pigments. The final result was satisfactory, with the greenish area completely corrected and the entire areola harmonised to present a natural appearance.

Conclusion

Advanced nursing care successfully treated uncommon greenish areolar post-necrotic scar tissue following breast cancer surgery. This case study presents an unusual clinical scenario and adds valuable information to the literature on personalised NAC dermopigmentation following breast cancer surgery.

Background

NAC ischemia is a clinically relevant complication after nipple-sparing mastectomy. Literature reports include both transient ischemic discoloration and cases progressing to partial or complete necrosis requiring treatment: available evidence indicates that partial NAC necrosis after nipple-sparing mastectomy occurs in approximately 4.6% of cases (1). Other studies report broader ranges as they

include any transient ischemic change (2) (3). Long-term residual changes are more commonly reported as hypopigmentation, depigmentation, dyschromia or scar-related pigment disorder. These sequelae can persist despite successful oncological and reconstructive treatment and may continue to affect the patient's perception of bodily integrity. In this context, medical tattooing represents a non-surgical option for NAC colour restoration and camouflage. The technique introduces pigment into the superficial papillary dermis using an electric device and sterile disposable needles. Recent reviews describe NAC tattooing as safe, well tolerated and generally associated with satisfactory aesthetic and patient-reported outcomes (4) (5).

Evidence specifically addressing tattoo-based correction of ischemia-related areolar hypopigmentation is scarce but clinically relevant. Medical tattooing has been described as a method for concealing scars, discolorations and pigment loss (6). However, persistent greenish or grey post-ischemic areolar discoloration is not clearly documented as a typical long-term NAC outcome: most reports describe ischemic colour change that resolves, progresses to necrosis and eschar, or heals with hypopigmentation, depigmentation, dyschromia or scarring (3) (7). The aim of this paper is to report on a nursing-led, stepwise chromatic correction of a uncommon stable greenish post-necrotic areolar scar.

Case presentation

Clinical history

A 50-year-old Caucasian woman who used to smoke, does not drink alcohol and had one pregnancy at the age of 39. She has no allergies. The anamnesis reveals fibromyalgia, a trait of thalassaemia, migraines, irritable bowel syndrome and bronchial asthma. Mastodynia appeared in the right breast in December 2020. She underwent mammography and further diagnostic tests, ultimately receiving a diagnosis of grade 2 ductal carcinoma in situ. She underwent surgery in February 2021, followed by chemoprevention with tamoxifen in March.

On 17 February 2021, she underwent a right NAC-sparing mastectomy with a bipedunculated flap, as well as a sentinel node biopsy of the axillary lymph node. The reconstruction involved an expander placed in a pocket created from a lower dermal flap, the pectoralis major muscle and the fascia of the anterior dentate muscle. Following a normal postoperative course, she was discharged on 20 February. She continued with outpatient visits and dressings in the following weeks. At the first follow-up on 22 February, her clinical condition was good, with serous and productive drains in place and a vital nipple. There were areas of superficial ischaemia in the process of demarcation. Superficial punctures were performed on the areola and enoxaparin was applied locally. Controls were scheduled at approximately 10-day intervals to monitor the complication. At the subsequent check-up, sodium hyaluronate + collagenase was applied on the ischemic area and dressed with greasy gauze. At the third check-up, a loss of substance approximately 1 cm was noted between the 5 and 6 o'clock positions on the areola, and this was treated with an anti-microbial wound dressing. Dressings were continued until healing was complete. The expansion was completed in November, and the NAC appeared fully healed.

On 25 May 2023, she underwent removal of the right breast expander and insertion of the prosthesis, as well as mastopexy on the left breast. The recovery was uneventful. At the most recent controls at the end of 2025, she showed no signs of recurrence, and the controls were negative. From a surgical point of view, she presented a Baker I capsular contracture on the right breast and had the medical indication for medical tattooing.

Nursing assessment and care

In February 2026, the patient was taken in charge by the ARCADE nurse-led NAC tattooing clinic of the plastic surgery service of the Health Local Authority of Reggio Emilia, Italy. The clinic provides NAC medical tattooing (8): each NAC tattooing treatment involves, on average, three sessions 30–40 days apart. Nurses specialized in NAC tattooing perform the treatments on medical indication with aseptic technique. They have valuable experience and expertise in the management of cancer patients. The NAC reproduction is performed using a dermatograph equipped with sterile disposable needles. The pigments used are bio-absorbable, and color fading is normal over time. Before the sessions, an anaesthetic cream is applied on the NAC for 30 minutes. After the sessions, colour is applied directly to the treated area as a dressing, which allows for optimal absorption of the colour.

During the nursing assessment, the patient was in good physical condition and wanted to correct the appearance of the right areola. Due to the difficult healing process after the first intervention, there were areas of hypopigmentation and ischaemic results at 5–6 o'clock, resulting in a greenish area (see Fig. 1). The treatment objective, agreed with the patient, was to neutralise the green/grey colour and to uniform the entire areola by reproducing the original colour. The current shape was maintained. A synthesis of the materials used is described in Table 1.

The first tattoo session, held on 10/02/2026, was focused on the neutralization of the greenish color. The specialist nurse used a pure orange corrector and a 7-size needle, and pigmented the selected area (see Fig. 2). No petecchia formed on the area. The session was concluded without any adverse events and was well tolerated. The perceived pain level was 2/10 on the NRS scale.

On 24/03/2026, the patient attended the second session. She reports having adhered to the post-treatment instructions, with minimal fading of the color. The areola was fully pigmented by using a 5-size needle, with 20 drops of derma 7 and 6 drops of derma 9 pigment. For the nipple, a pure derma 9 pigment was used. The patient tolerated this session with minimal pain (NRS 4), with a normal minimum appearance of petechiae for this type of treatment. The result is showed in Fig. 3.

On 28/4, the third and final session took place, with no problems reported in recent weeks. In Fig. 4 the NAC presents full pigment absorption, at more than 30 days after the last treatment. In this session, the same colours and quantities were used, with a 7-size needle. The patient tolerated well this session (NRS 1), with minimal petechiae (Fig. 5).

Approximately one month after this session, the areola has completely healed and the colour has been absorbed. As can be seen in Fig. 6, the result is satisfactory: the greenish area has been completely corrected and the entire areola is harmonized and presented a natural aspect.

Table 1
Materials used for the treatment

Materials used	Size/type	Dose	Session	Date
Pigment	Orange corrector	AB	First Session	10/02/2026
Needle	7	-		
Pigment	Pinkish brown	20 drops	Second Session	24/03/2026
	Dark pink	6 drops		
	Dark pink (nipple)	AB		
Needle	5			
Pigment	Pinkish brown	20 drops	Third Session	28/04/2026
	Dark pink	6 drops		
	Dark pink (nipple)	AB		
Needle	7			

Discussion and conclusion

The case presented here represents an uncommon clinical scenario and makes a useful contribution to the literature on personalised NAC dermopigmentation after breast cancer surgery. Notwithstanding the implementation of optimal and expeditious therapeutic interventions, it has been observed that women frequently encounter persistent challenges of an aesthetic and psychosocial nature (8). This approach yielded optimal results in terms of both colour correction and the overall natural appearance and health of the NAC. The nursing care provided a substantial contribution to the recovery of the patients, achieving optimal aesthetic outcomes through a meticulous and evidence-based approach that was both safe and effective. Notwithstanding, the primary objective was to resolve a rare condition that had arisen as a consequence of a medical complication during the care process (summarized in Fig. 7). In this particular case, which is the first of its kind to be documented, the personalised approach has been of the utmost importance. From the outset, the objective of the care journey was made explicit and continuous feedback and refinements were pursued. Among the most notable of these benefits is the careful consideration of the optimal timing between applications to ensure optimal cutaneous healing and maximum colour absorption. Each step in the process was driven by a specific aim and rationale. The integration of colour theory with advanced nursing practice and medical tattooing techniques has resulted in the emergence of a distinct expertise that merits further investigation (9) (10). However, the validity of this result is limited due to the paucity of literature on this subject. It is imperative that

professionals within the same field share their experiences in order to enhance the quality of care and the body of knowledge in this area.

Advanced nursing care managed an uncommon greenish areolar post-necrotic scar tissue after breast cancer surgery. With a personalized medical tattooing intervention, the NAC natural appearance was restored and harmonized, providing a satisfactory aesthetic result.

Declarations

Ethics approval and consent to participate

The local ethical committee “Area Vasta Emilia Nord” was informed about the care report, which did not require a formal evaluation in our local area (AUSLRE Protocol n° 2026/0066912 del 29/04/2026). The participant signed a informed consent.

Consent for publication

The patient gave written informed consent for her clinical details along with any identifying images to be published in this study.

Availability of data and materials

The dataset analysed during the current study are not publicly available due to privacy reasons, but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests

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Authors' contributions

Conception/design: FC, DM, LT, CC, SC; Data collection: DM, LT; Data Interpretation: DM, LT; Drafting and Revision: DM, LT, SC. All authors read and approved the final manuscript.

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Figures



Figure 1

NAC hypopigmentation and greenish area at time of nursing assessment.



Figure 2

Neutralization of the color in the critical area.



Figure 3

Complete NAC tattooing in the second session



Figure 4

Full absorption of color and healing after 30 days.



Figure 5

NAC right after the final session.



Figure 6

Final result

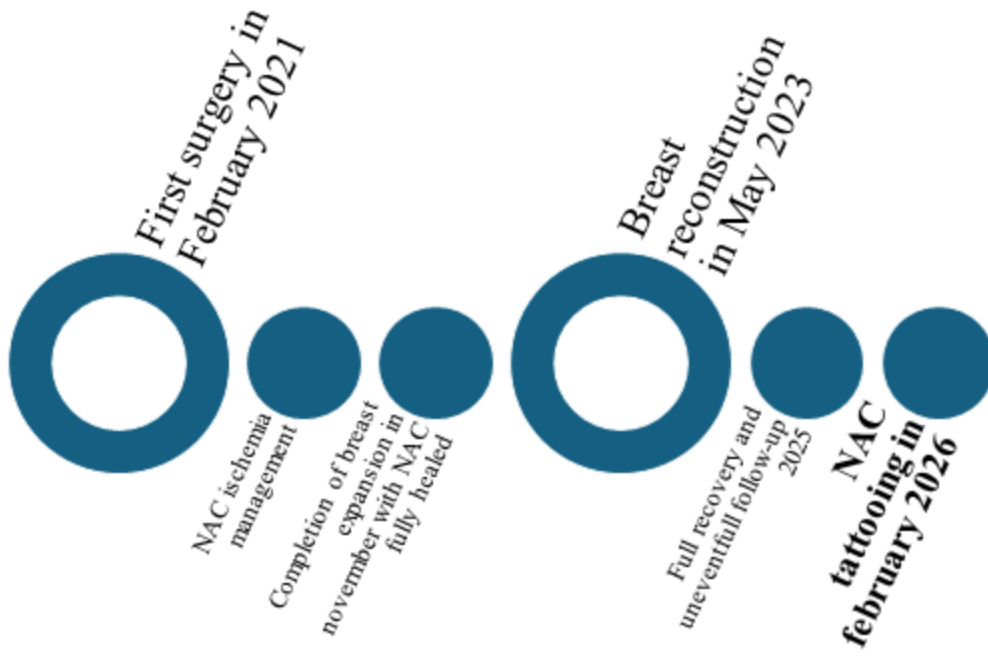


Figure 7

Main clinical events until NAC tattooing.