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Foreign-Body Reaction Presenting as Persistent Postoperative Dermatitis Following Breast Expander Reconstruction Requiring Explantation: A Case Report

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ABSTRACT

Background: Foreign-body reaction (FBR) is an uncommon clinically significant complication of implant-based breast reconstruction. Persistent postoperative dermatitis may mimic more frequent complications such as infection, malignancy, lymphatic dysfunction, or hypersensitivity, making diagnosis challenging.

Case Presentation: A 48-year-old woman developed persistent pruritic dermatitis after immediate breast reconstruction with a tissue expander. The skin changes progressed despite antibiotic and topical corticosteroid therapy and remained unchanged after expander deflation. Infection, implant rupture, and malignancy were investigated and reasonably excluded. Explantation with total capsulectomy was subsequently performed as both a diagnostic and therapeutic intervention. Histopathological examination demonstrated a reactive lymphoplasmacytic infiltrate with focal multinucleated foreign-body giant cells within the periprosthetic capsule, without microorganisms or malignancy. The dermatitis completely resolved following explantation.

Conclusion: Clinically significant FBR should be considered in patients with persistent postoperative dermatitis after implant-based breast reconstruction when more common etiologies have been reasonably excluded. Explantation may provide diagnostic clarification and therapeutic resolution in selected cases.

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INTRODUCTION

Implant-based reconstruction is widely used following mastectomy because of its reproducibility and favorable outcomes.[1–4] However, complications include infection, capsular contracture, chronic pain, foreign-body reaction (FBR), and other implant-related inflammatory conditions.[5,6]

FBR is an immune-mediated response to implanted biomaterials that may result in chronic inflammation and fibrosis.[5,6] Although cutaneous manifestations are uncommon, persistent postoperative dermatitis may mimic infection, contact dermatitis, lymphatic dysfunction, medication reactions, or locoregional recurrence, making diagnosis challenging.[7,8]

We report a case of persistent postoperative dermatitis following immediate tissue expander reconstruction in which systematic evaluation of alternative etiologies favored a clinically significant implant-associated FBR. Histopathological examination demonstrated chronic capsular inflammation with focal multinucleated foreign-body giant cells, and complete resolution occurred following explantation.

CASE PRESENTATION

A 48-year-old woman with left breast invasive ductal carcinoma of no special type (NST), associated with intermediate-grade ductal carcinoma in situ, underwent quadrantectomy with sentinel lymph node biopsy in August 2024. The invasive tumor measured

2.4 cm and was well differentiated (histologic grade 1), with no lymphovascular invasion or nodal involvement (0/1). Immunohistochemistry showed estrogen receptor positivity (Allred score 7), progesterone receptor positivity (Allred score 7), HER2 negativity (score 0), and Ki-67 of 8%. Due to compromised margins, completion nipple-sparing mastectomy with sentinel lymph node assessment was subsequently performed, again showing no nodal involvement (0/1). Immediate reconstruction used a retropectoral Mentor™ CPX™ 4 tissue expander (350 cc) with a textured Siltex™ surface. The pocket involved dissection of the pectoralis major and serratus anterior muscles. The expander was initially filled to 300 cc. No acellular dermal matrix, mesh, or other additional biomaterial was used. The mastectomy skin flaps were viable, without tension, perfusion compromise, or necrosis. No subsequent expansion sessions were performed. Adjuvant endocrine therapy was initially started with tamoxifen and subsequently changed to anastrozole with goserelin. She did not receive radiotherapy.

Approximately 1 month after reconstruction, the patient developed an intensely pruritic erythematous plaque with irregular borders in the upper inner quadrant of the reconstructed breast, measuring approximately 7 × 4.5 cm (Figure 1A). Because the appearance suggested cellulitis, she received 14 days of oral antibiotics. The lesion enlarged to approximately 9 × 6 cm despite treatment, with persistent pruritus and localized burning pain; she remained afebrile and without systemic symptoms (Figure 1B). Inflammatory markers obtained on April 30, 2025 showed an erythrocyte sedimentation rate (ESR) of 91 mm/h and a C-reactive protein (CRP) level of 1.57 mg/dL. On May 5, 2025, the CRP level was 0.77 mg/dL, and on May 20, 2025, the ESR was 26 mm/h. Serial breast ultrasonography showed an intact, normally positioned expander without rupture or significant periprosthetic collection; no hematoma or abscess was identified. Altered echogenicity of the cutaneous plane was compatible with an inflammatory process.

A second course of antibiotics using a different antimicrobial class produced no improvement. Approximately 3 months after reconstruction, the dermatitis extended to the lateral breast, ipsilateral inframammary region, and lower thoracic wall, measuring approximately 15 × 10 cm. Skin biopsy to exclude locoregional recurrence and evaluate inflammatory dermatoses showed lymphohistiocytic perivascular dermatitis with eosinophils, without dysplasia or malignancy. Medium-potency topical corticosteroids were unsuccessful. Eosinophils raised the possibility of delayed hypersensitivity or allergic contact dermatitis; however, patch testing for silicone, adhesives, acrylates, metals, or other device components was not performed. The patient had no known relevant allergic history. Because the dermatology team considered lymphatic obstruction a possible contributor, the expander was deflated; this was a clinical hypothesis rather than evidence of obstruction. The lesions remained unchanged. The patient subsequently developed cellulitis after deflation, requiring hospitalization and broad-spectrum intravenous antibiotics (Figure 2). The cellulitis resolved, but the pre-existing dermatitis persisted. Infection, implant rupture, and locoregional recurrence were investigated through clinical assessment, serial ultrasonography, microbiological evaluation of periprosthetic specimens, and skin histopathology. No MRI, CT, PET/CT, or additional mammographic evaluation was performed.

Eight months after reconstruction, explantation was recommended as a therapeutic and diagnostic intervention because of persistent dermatitis despite resolution of the infectious episode and investigation of major alternative diagnoses. Immediate autologous reconstruction was offered, as further implant-based reconstruction was considered inadvisable in the context of the suspected implant-related inflammatory reaction. The patient declined further reconstruction. The intact expander was removed and total capsulectomy performed, followed by pocket irrigation, purse-string closure, and primary closure with inferior and lateral tissue flaps. The capsule was markedly thickened and fibrotic, with periprosthetic fibrin and a small amount of serous fluid.

Histopathological examination demonstrated fibrocollagenous tissue with reactive lymphoplasmacytic inflammation and focal multinucleated foreign-body giant cells (Figure 3). No microorganisms or malignant cells were identified; AE1/AE3 was negative, and no atypical lymphoid proliferation was identified. No particulate, refractile, or silicone-containing foreign material was documented. Microbiological studies of periprosthetic specimens, including aerobic and anaerobic cultures, mycobacterial studies, Gram stain, potassium hydroxide preparation, smear microscopy, and PCR for Mycobacterium tuberculosis, were negative. Following explantation, the cutaneous erythema and inflammatory changes progressively resolved without additional treatment (Figure 4). This clinical resolution, together with the chronic capsular inflammation and focal foreign-body giant-cell reaction, favored a clinically significant implant-associated foreign-body reaction. However, because no specific foreign material was identified and patch testing was not performed, delayed hypersensitivity or an allergic mechanism could not be definitively excluded.

DISCUSSION

Implant-based breast reconstruction is widely used following mastectomy, with tissue expander/implant-based reconstruction accounting for almost 65% of breast reconstructions in the United States.[2–4] Complications include infection, seroma, hematoma, skin-flap necrosis, capsular contracture, chronic pain, breast implant-associated anaplastic large-cell lymphoma (BIA-ALCL), and less frequently, foreign-body reaction (FBR) or hypersensitivity-related manifestations.[2–4,7–9] The present case is noteworthy because persistent and progressive

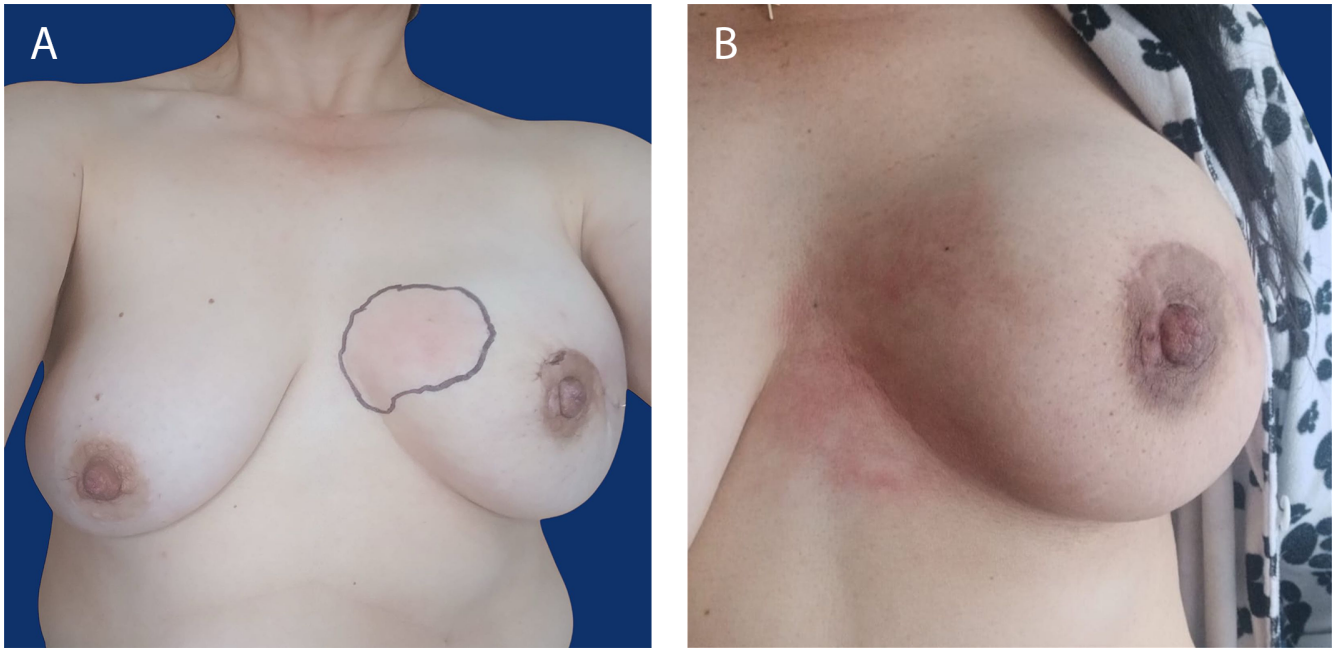


Figure 1. Progression of Dermatitis Despite Antibiotic Treatment
A, One month postoperatively, an erythematous plaque with irregular borders measuring 7 × 4.5 cm in the upper inner quadrant of the left breast. B, Persistent erythematous plaque despite antibiotic treatment, with extension to the lower inner quadrant and inframammary region, measuring approximately 9 × 6 cm.

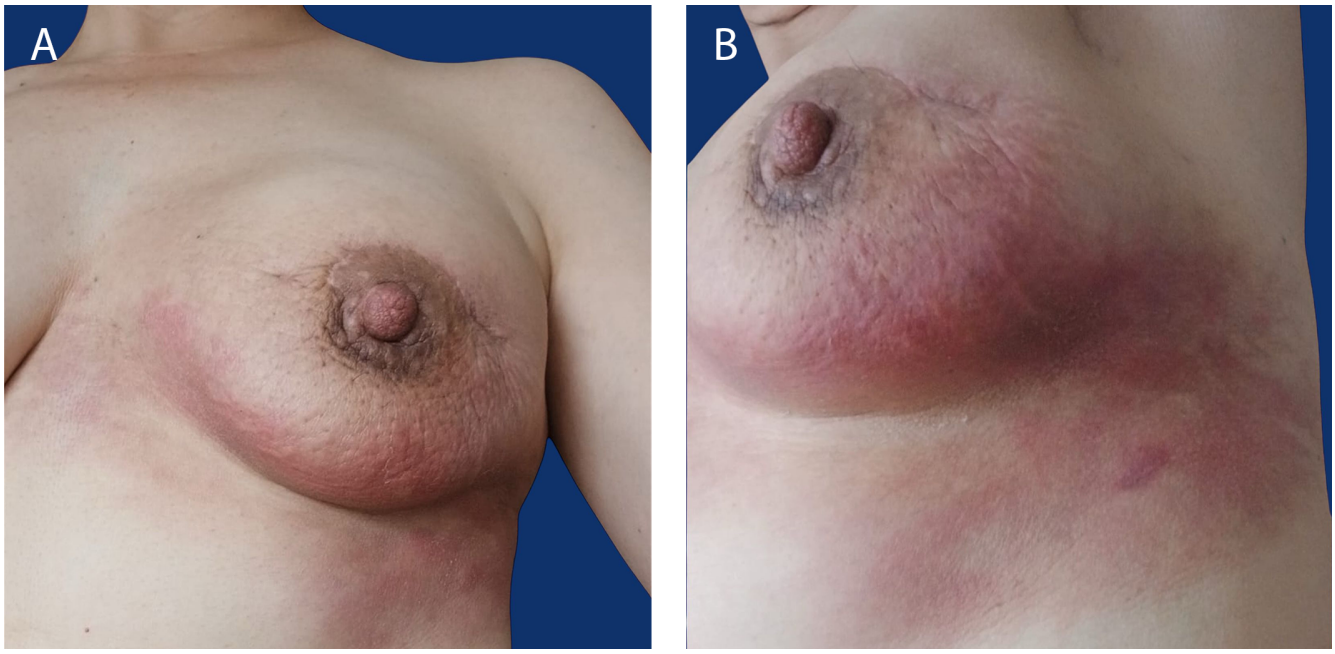


Figure 2. Cellulitis Following Expander Deflation
A, Frontal view showing cellulitis involving the lower outer quadrant of the left breast, extending to the inframammary fold and ipsilateral lower thoracic wall. B, Left inferior oblique view showing cellulitis involving the lower outer quadrant of the left breast, extending to the inframammary and lateral thoracic regions up to the midaxillary line.

dermatitis was the predominant manifestation of a suspected implant-associated inflammatory reaction and initially mimicked infection.

FBR is a physiological response to implanted biomaterials involving macrophage activation, fibroblast recruitment, and tissue remodeling. Persistent stimulation may result in multinucleated foreign-body giant cells, chronic inflammation, and fibrosis.[5,6] Although giant cells may occur as part of normal capsule formation, their clinical significance must be interpreted in context. In this case, the markedly thickened and fibrotic capsule showed reactive lymphoplasmacytic inflammation with focal multinucleated foreign-body giant cells. These findings, together with persistent dermatitis, failure of conservative treatment, exclusion of major alternative diagnoses, and complete resolution following explantation, favored a clinically significant implant-associated FBR.

The differential diagnosis includes infection, inflammatory dermatoses, mechanical or lymphatic

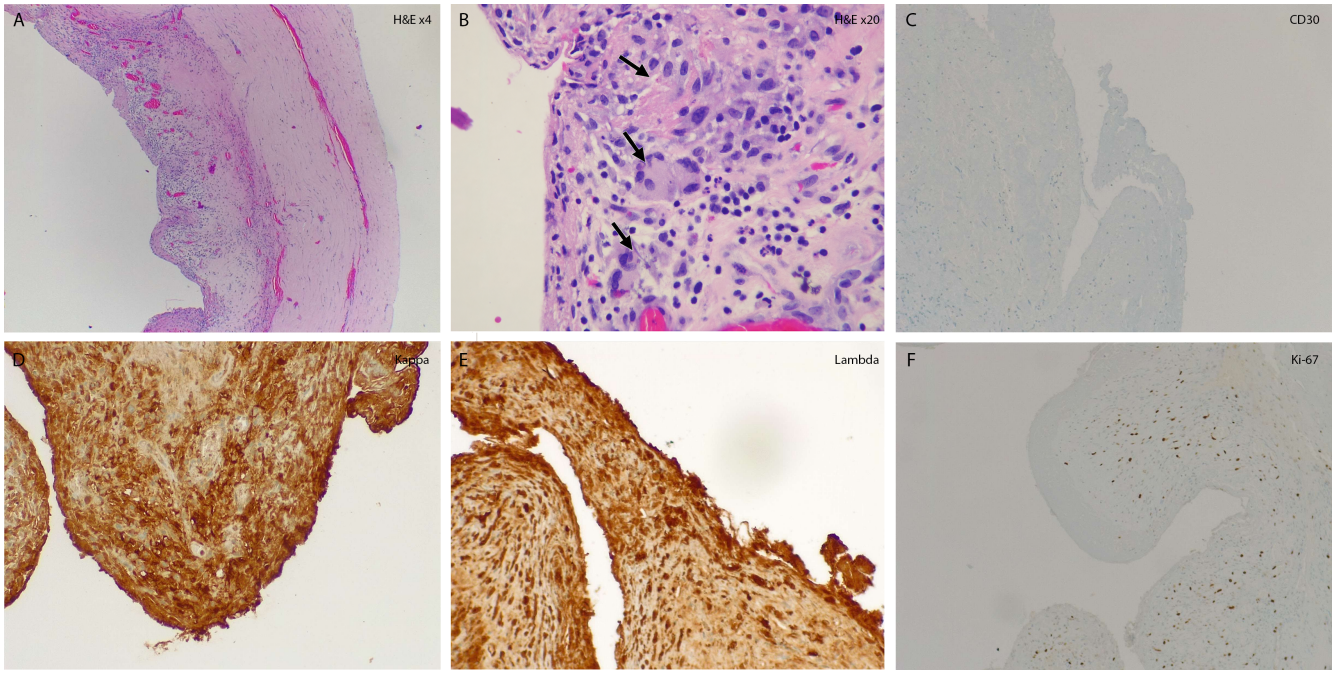


Figure 3. Histopathological and Immunohistochemical Findings of the Periprosthetic Capsule
A, Hematoxylin-eosin (H&E) staining, ×4 magnification. Fibrous capsule with inflammatory reaction, showing laminar fragments of fibrous collagen tissue with reactive lymphoplasmacytic infiltrate and focal multinucleated foreign-body giant cell reaction. No microorganisms or granulomas are observed. B, H&E staining, ×20 magnification. Close-up of the capsule showing multinucleated foreign-body giant cells (black arrows) within the inflammatory infiltrate. C, CD30 immunostaining, showing no abnormal CD30-positive lymphoid proliferation. D, Kappa immunostaining. E, Lambda immunostaining. F, Ki-67 immunostaining, showing low proliferative activity, supporting the absence of a highly proliferative lymphoid process.

dysfunction, medication reactions, and locoregional recurrence.[8] Two courses of antibiotics failed to improve the pre-existing dermatitis, while serial ultrasonography showed an intact expander without significant collection or rupture. Microbiological studies of periprosthetic specimens obtained at explantation were negative. Importantly, cellulitis that developed after expander deflation resolved with intravenous antibiotics, whereas the pre-existing dermatitis persisted, supporting the distinction between these processes. Lack of improvement after deflation also made lymphatic obstruction or mechanical compression less likely to be the sole explanation. Delayed hypersensitivity or allergic contact dermatitis remains an important alternative. Eosinophils in the skin biopsy may occur in hypersensitivity-related reactions but are not specific for allergy.[7,8] Delayed hypersensitivity has also been reported in association with silicone breast implants, including cases presenting with cutaneous manifestations after breast reconstruction.[10] Bosker *et al.* reported persistent pruritic erythema associated with a tissue expander that resolved after capsulectomy, leading to consideration of an implant-related FBR.[7] Our case similarly involved pruritic erythema, failure of conservative treatment, an intact expander, and resolution after device removal, but demonstrated more extensive dermatitis and marked capsular fibrosis with focal foreign-body giant cells. Because patch testing was not performed and no specific particulate or silicone-containing material was identified, hypersensitivity cannot be definitively excluded.

A medication-related reaction was another relevant differential because localized cutaneous adverse reactions to anastrozole have been reported.[12] In this case, dermatitis persisted and progressed despite ongoing anastrozole therapy and subsequently resolved after explantation, making a drug-related reaction less likely as the primary cause, although it cannot be completely excluded.

BIA-ALCL was also considered because of the textured implant surface. It typically presents with delayed seroma or, less commonly, a capsular mass.[11] In this case, there was no suspicious mass or significant persistent collection, and histopathological and immunohistochemical evaluation showed no malignancy or atypical lymphoid proliferation, arguing against this diagnosis.

The combination of persistent cutaneous inflammation, chronic capsular inflammation with focal foreign-body giant cells, failure of conservative treatment, and resolution after explantation favored a clinically significant implant-associated FBR. Nevertheless, the absence of identifiable foreign material and lack of patch testing prevent definitive distinction from delayed hypersensitivity. This case highlights persistent postoperative dermatitis as an uncommon manifestation of an implant-associated inflammatory response and the importance of considering device-related causes when inflammation persists despite conventional management.



Figure 4. Post-Explantation Clinical Outcome
Complete resolution of the dermatitis and inflammatory changes following tissue expander removal, with scar retraction of the nipple–areola complex.

CONCLUSION

Foreign-body reaction should be considered in the differential diagnosis of persistent postoperative dermatitis following implant-based breast reconstruction when infection, malignancy, and other common etiologies have been reasonably excluded. In this case, the combination of persistent cutaneous inflammation, chronic capsular inflammation with focal foreign-body giant cells, failure of conservative treatment, and complete resolution after explantation favored a clinically significant implant-associated FBR. However, the absence of identifiable foreign material and lack of patch testing prevented definitive exclusion of delayed hypersensitivity. Early recognition of this uncommon presentation may help avoid prolonged ineffective treatment and guide appropriate surgical management.

ETHICAL CONSIDERATIONS

Written informed consent was obtained from the patient for publication of the clinical information and images included in this case report. This case report was not submitted to an ethics committee, and ethics committee approval was not required for this single case report.

DATA AVAILABILITY

All relevant clinical information supporting the findings of this case report is contained within the manuscript. Additional patient-level information is not

publicly available because of patient confidentiality but may be made available by the corresponding author upon reasonable request, subject to applicable privacy and ethical restrictions.

CONFLICT OF INTERESTS

The authors declare that they have no conflicts of interest related to this work.

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AI DISCLOSURE

The authors used ChatGPT (OpenAI) for language editing and manuscript revision. All content was reviewed and approved by the authors.

AUTHOR CONTRIBUTIONS

JPZD: Conceptualization, Investigation, Writing – original draft. MABN: Investigation, Resources, Writing – review & editing, Supervision. LAGB: Investigation, Writing – review & editing. AMAC: Investigation, Resources, Writing – review & editing. MLCL: Formal analysis, Investigation, Writing – review & editing.

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