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Case Report

Late-Onset Milky Peri-Implant Fluid Collection Following Rupture of a Textured Saline Implant in a Previously Radiated Breast: A Benign Mimic of Breast Implant-Associated Anaplastic Large Cell Lymphoma (BIA-ALCL)

Melika Z Deaton[1], Alexandra Boric[1], Grant W Carlson[1*]

[1]Division of Plastic Surgery, Emory University School of Medicine, USA

***Correspondence author:** Grant W Carlson, MD, Division of Plastic Surgery, Emory University School of Medicine, USA; Email: gcarlso@emory.edu

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Abstract

Background: Late-onset peri-implant fluid collections require rigorous evaluation to exclude Breast Implant-Associated Anaplastic Large Cell Lymphoma (BIA-ALCL). While milky effusions often raise concern for malignancy or silicone gel bleed, their occurrence in saline implant reconstructions is rare.

Case Description: A 63-year-old female presented with volume loss 28 years after right total mastectomy and subpectoral textured McGhan saline implant reconstruction followed by adjuvant radiotherapy. Computed tomography confirmed implant deflation and a small peri-implant fluid collection. Surgical exploration revealed a ruptured saline implant and 30 cc of thick, milky-white fluid within a densely calcified capsule. Flow cytometry and hematopathology were negative for CD30 expression and monoclonality, excluding BIA-ALCL. A total capsulectomy was performed. A dense fibrous capsule with calcification was noted and no malignancy identified.

Conclusion: This case demonstrates that late peri-implant fluid collections occurring around textured saline implants, even when grossly milky in appearance, are not pathognomonic for BIA-ALCL. Comprehensive pathologic evaluation remains essential to distinguish benign delayed seromas from implant-associated malignancy.

Keywords: Textured Saline Implant; ALCL; Ruptured Saline Implant; Milky Delayed Seroma; Prior Radiation

Introduction

Late-onset peri-implant fluid collections require rigorous evaluation to exclude Breast Implant-Associated Anaplastic Large Cell Lymphoma (BIA-ALCL). While milky effusions often raise concern for malignancy or silicone gel bleed, their occurrence in saline implant reconstructions is rare.

Case Presentation

A 63-year-old female presented for evaluation of a loss of volume in her right reconstructed breast. Her surgical history was significant for a right total mastectomy in January of 1998 for Stage IIA invasive ductal carcinoma, followed by immediate subpectoral reconstruction with a McGhan Style 168 textured saline implant (Fig. 1). She subsequently underwent adjuvant Post-Mastectomy Radiotherapy (PMRT). The patient had been otherwise asymptomatic, with no history of trauma, fever or weight loss. Physical examination revealed a partially deflated R breast implant but no palpable masses, axillary lymphadenopathy or skin changes.

Preoperative Imaging

A CT scan of the chest demonstrated a deflated right implant with a small peri-implant fluid collection (Fig. 2). A notable finding was the presence of circumferential, dense calcification of the implant capsule, a hallmark of long-standing capsular contracture exacerbated by prior radiation.

Surgical Intervention and Findings

The patient underwent surgical exploration for explantation and capsulectomy. Upon incision of the capsule, approximately 30 cc of thick, opaque, milky-white fluid was encountered and collected for analysis (Fig. 2). The saline implant was found to be completely ruptured with a degraded shell (Fig. 3). The fibrous capsule was severely thickened and exhibited extensive dystrophic calcification, appearing as rigid, fragmented plates (Fig. 4). A total capsulectomy was performed, which required careful dissection due to the rigidity of the calcified tissue against the chest wall.

Pathology and Analysis

The milky fluid was sent for immediate flow cytometry and hematopathology. Flow cytometric immunophenotyping was limited by low cellularity and viability but demonstrated no evidence of a monoclonal T-cell population. Immunohistochemistry (IHC) was negative for CD30 and ALK, effectively excluding BIA-ALCL [1]. Examination of the capsule demonstrated dense fibrous tissue with extensive dystrophic calcification and no evidence of malignancy.

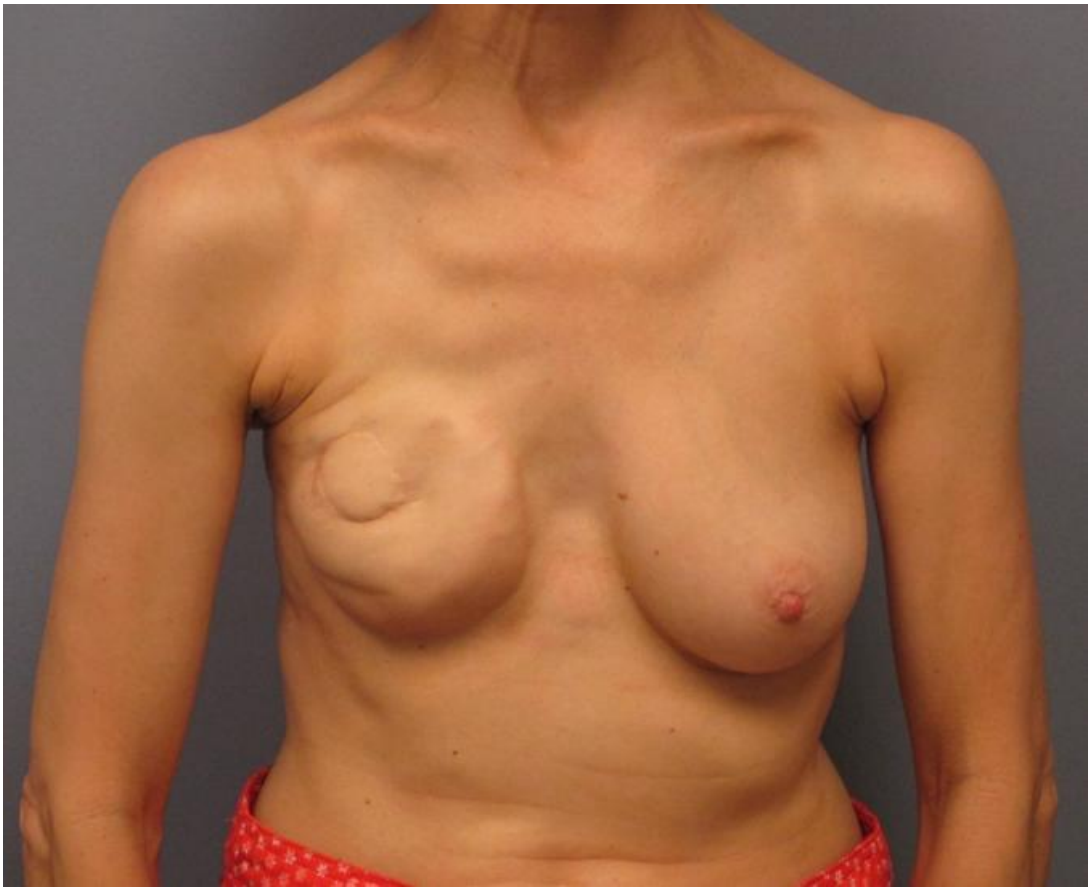

Figure 1: A 63-year-old female presented with sudden volume loss 28 years after R skin sparing mastectomy, latissimus musculocutaneous and McGhan Style 168 BIOCELL textured saline implant reconstruction followed by adjuvant radiotherapy.

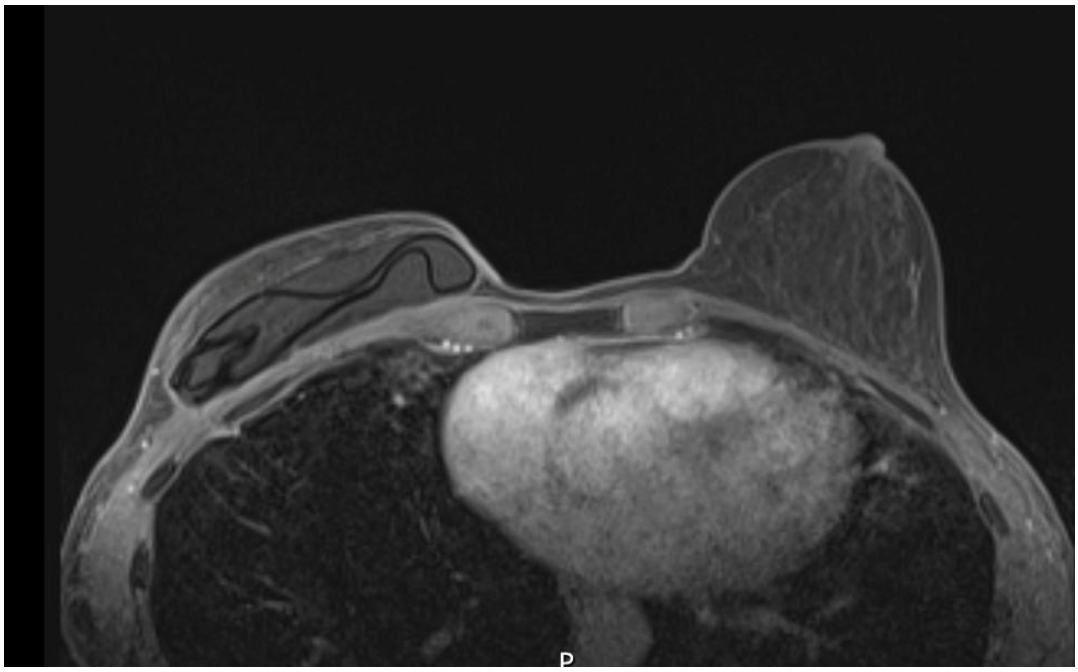

Figure 2: Axial CT image of the chest showing a deflated right saline implant with associated curvilinear densities and prominent circumferential calcification of the fibrous capsule.

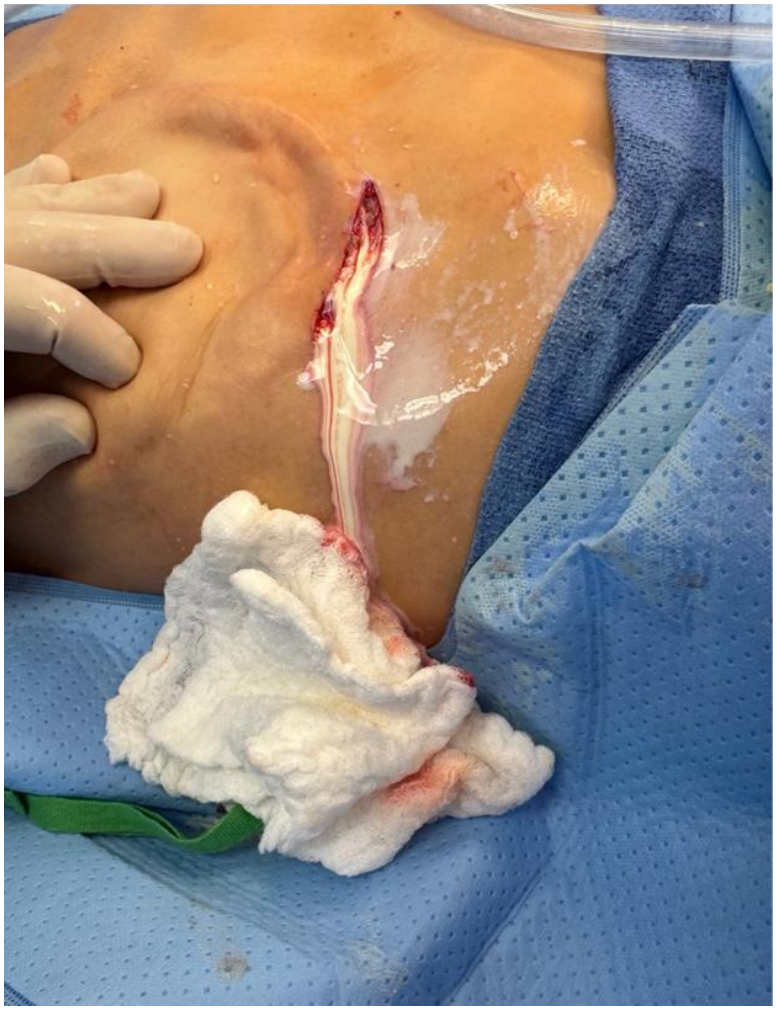

Figure 3: Evacuation of 30 cc of sterile, milky-white fluid upon entering the calcified peri-implant space

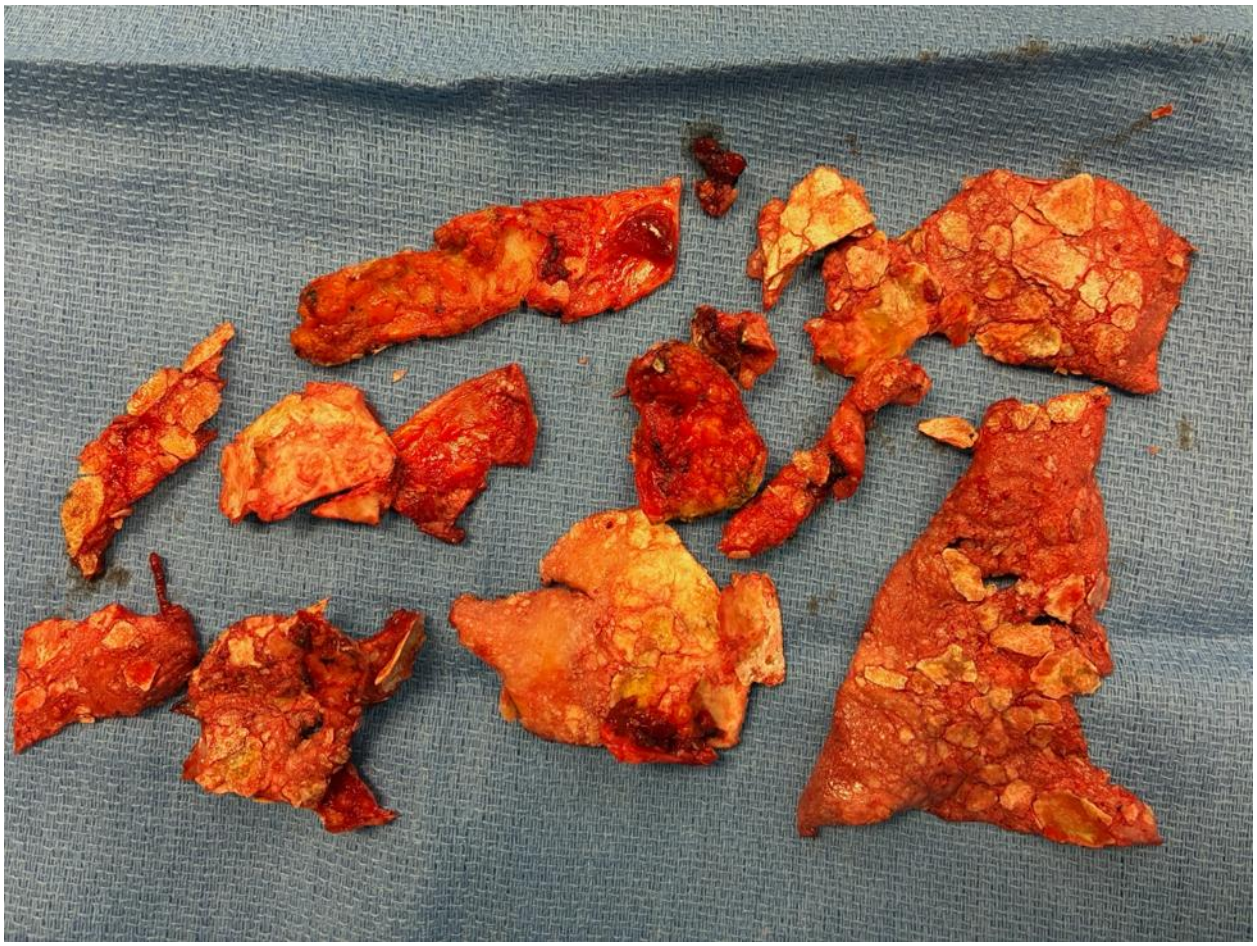

Figure 4: Gross specimen of the excised capsule demonstrating dense, hyalinized fibrosis and extensive plates of dystrophic calcification ("eggshell" appearance).

Discussion

Literature review was unable to identify a comparable case associated with a ruptured textured saline implant and severe radiation-associated capsular calcification. To our knowledge, a late- onset milky peri-implant fluid collection associated with rupture of a textured saline implant within a severely calcified, previously irradiated capsule has not been previously reported. This unusual presentation initially raised concern for BIA-ALCL, emphasizing the diagnostic challenge posed by delayed peri-implant fluid collection in patients with textured implants. The implant was a McGhan Style 168 BIOCELL textured saline implant, a textured device later recognized among implant types associated with BIA-ALCL. The milky appearance of the fluid heighten concern for BIA-ALCL. Although the fluid lacked biochemical characterization necessary to definitively establish a pseudochylous effusion, the absence of silicone gel, the presence of a long-standing calcified capsule and benign cytologic and flow cytometric findings suggest that collection most likely represented a host-derived degenerative fluid accumulation rather than an implant-derived material of malignancy. The fragmented capsule and extensive dystrophic calcification are consistent with long-standing capsular degeneration in the setting of prior radiotherapy.

Late-onset peri-implant fluid collections occurring years after breast reconstruction present a well-recognized diagnostic challenge and must prompt thorough evaluation to exclude Breast Implant-Associated Anaplastic Large Cell Lymphoma (BIA-ALCL). BIA-ALCL is a T-cell non-Hodgkin lymphoma that most commonly presents as a delayed peri-implant effusion several years after implantation of textured devices and is characterized by CD30 positivity and ALK negativity on immunohistochemistry. Complete surgical excision remains the cornerstone of treatment once diagnosed [2,3].

However, not all late seromas are malignant. BIOCELL textured implants have been reported to be associated with late seromas more frequently than smooth-surfaced implants [4]. Benign etiologies of delayed peri-implant fluid collections include implant rupture, infection, hematoma, mechanical irritation and chronic inflammatory changes of the capsule. Importantly, while the

presence of "milky" or opaque fluid is often perceived as a clinical red flag for malignancy, fluid appearance alone lacks diagnostic specificity in the absence of cytologic and immunophenotypic confirmation [3].

In silicone gel-filled implants, milky or cloudy effusions are most attributed to silicone-induced granulomatous reactions or low-molecular-weight silicone transudation ("gel bleed") through an intact elastomer shell. This process incites a chronic histiocytic response, resulting in a lipid-rich, opaque suspension within the peri-implant space [5]. In contrast, saline implants contain no lipid-based filler capable of such leakage, making the occurrence of milky effusions in this setting distinctly uncommon and underrepresented in the literature.

Conclusion

The present case most likely represents a benign peri-implant effusion occurring in a textured McGhan saline implant patient that clinically mimicked BIA-ALCL. The absence of silicone gel, the benign cytologic findings and the negative BIA-ALCL evaluation support a non-malignant etiology.

The precise origin of the milky fluid remains uncertain. However, the absence of silicone gel, the presence of a chronically calcified irradiated capsule and negative cytologic and immunophenotypic evaluation suggest a benign host-derived fluid accumulation rather than malignancy.

This case underscores two important clinical principles. First, late-onset peri-implant fluid collections-even those with a milky or opaque appearance-are not pathognomonic for malignancy and require comprehensive pathologic evaluation to distinguish benign from malignant processes. Preoperative fluid analysis was not performed because the age of the implant and the severity of the capsular pathology necessitated explantation and total capsulectomy.

Notably, we were unable to identify published reports describing a similarly milky peri-implant fluid collection associated with BIA-ALCL. While the rarity of this finding may suggest an alternative benign etiology, fluid appearance alone cannot reliably distinguish malignant from non-malignant peri-implant effusions.

As implant-based breast reconstruction continues to mature and survivorship periods lengthen, awareness of rare but benign mimics of BIA-ALCL is essential to avoid unnecessary alarm while maintaining strict adherence to oncologic diagnostic standards.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethical Statement

The project did not meet the definition of human subject research under the preview of the IRB according to federal regulations and therefore was exempt.

Informed Consent Statement

Informed consent was obtained from all participants included in the study.

Authors' Contributions

All authors contributed equally to this paper.

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