OPEN

CASE REPORT

Bilateral Poly Implant Prothèse Implant Rupture: An Uncommon Presentation

Peter Mallon, MD*
François Ganachaud, PhD†
Caroline Malhaire, MD‡
Raphael Brunel†
Brigitte Sigal-Zafrani, MD§
Jean-Guillaume Feron, MD*
Benoit Couturaud, MD*
Alfred Fitoussi, MD*
Fabien Reyal, MD, PhD*

Summary: A woman in her 50s underwent delayed bilateral Poly Implant Prothèse implant reconstruction following mastectomy for breast cancer. Symptoms of implant rupture developed 43 months after surgery with an erythematous rash on her trunk. The rash then spread to her reconstructed breast mounds. Initial ultrasound scan and magnetic resonance imaging were normal; however, subsequent magnetic resonance imaging demonstrated left implant rupture only. In theater, following removal of both implants, both were found to be ruptured. The rash on her trunk resolved within 3 weeks in the postoperative period. Chemical analyses of silicone in both implants confirmed a nonauthorized silicone source; in addition, the chemical structure was significantly different between the left and right implant, perhaps explaining the variation in presentation. *(Plast Reconstr Surg Glob Open 2013;1:e29; doi:10.1097/GOX.0b013e318298e026; Published online 24 July 2013.)*

CASE PRESENTATION

A woman in her 50s was diagnosed in 1995 with a $T_2N_0M_0$ mixed infiltrating ductal carcinoma and ductal carcinoma in situ of her left breast. She underwent mastectomy, axillary node clearance, and implant reconstruction. In 1997, she developed $T_2N_2M_0$ infiltrating ductal carcinoma in the contralateral breast. She had neoadjuvant chemotherapy followed by simple mastectomy and axillary node clearance. Following postoperative recovery, she received adjuvant radiotherapy, tamoxifen, and Decapeptyl. In 2006, she requested for reconstruction of the right breast and underwent delayed right and left subpectoral Poly Implant Prothèse (PIP) implant reconstruction in May 2007 (left, 330 cm^3; right, 295 cm^3). There were no immediate postoperative complications.

During December 2010, she initially developed a unilateral erythematous rash on the left side of her trunk anteriorly (Fig. 1). There was no palpable abnormality of either breast mound. Our initial primary concern was to exclude malignant recurrence of her left breast. She therefore underwent extensive investigation of the rash and breast mounds. Punch biopsy of the rash revealed lymphocytic inflammatory change only. There was no evidence of malignancy. Computed tomography of chest/abdomen and ultrasound of breasts (April 2011) were normal. The patient was feeling well generally; however, the rash eventually spread to her breast mounds bilaterally. Magnetic resonance imaging (MRI) (August 2011) revealed edematous tissue underneath the left implant, but there was no radiological evidence of rupture. Repeat MRI 5 months later however confirmed bilateral implant rupture but with greater severity on the left side (Fig. 2). The patient was taken to theater (February 2012) for removal of implants. At theater, there was obvious rupture with surrounding inflammation of both implants and capsules (Fig. 3). Following bilateral implant removal and capsulectomy with copious saline irrigation, Allergan prostheses

*From the *Department of Surgery, Institute Curie, Paris, France; †INSA UMR CNRS 5223, Polymer Chemistry, Lyon, France; ‡Department of Radiology, Institute Curie, Paris, France; and §Department of Tumour Biology, Institute Curie, Paris, France.*

Received for publication January 11, 2013; accepted April 25, 2013.

Copyright © 2013 American Society of Plastic Surgeons. Unauthorized reproduction of this article is prohibited. This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 3.0 License, where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially.

DOI: 10.1097/GOX.0b013e318298e026

Disclosure: The authors have no financial interest to declare in relation to the content of this article. The Article Processing Charge was paid for by the authors.

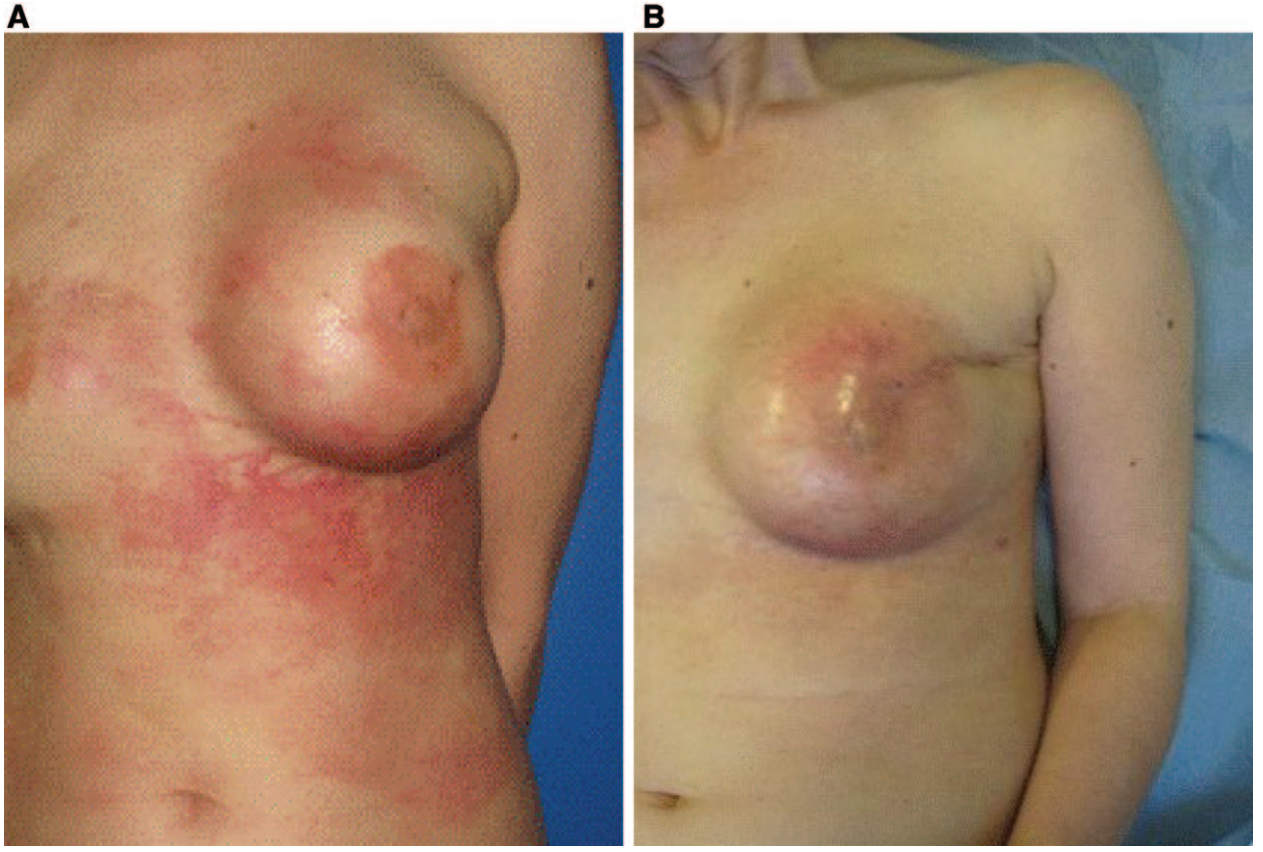

Fig. 1. Abdominal trunk rash. A, Preremoval of PIP implant. B, Three weeks postremoval of PIP implant.

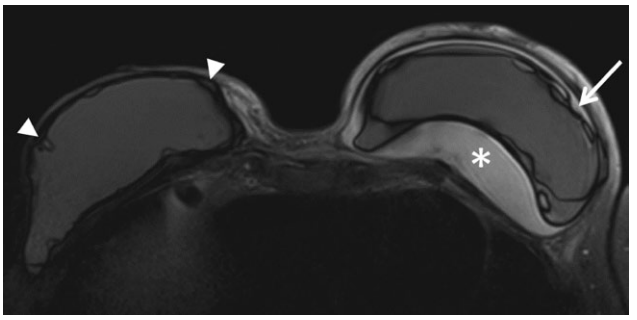

Fig. 2. Axial T2 weighted fat-suppressed MRI sequence shows partially collapsed shell of the left breast implant (white arrow) surrounded by reactive fluid of high signal intensity (asterisk) and subcapsular hypointense wavy line of the right breast implant (arrowheads) without collapse of the shell, indicative of bilateral breast implant rupture.

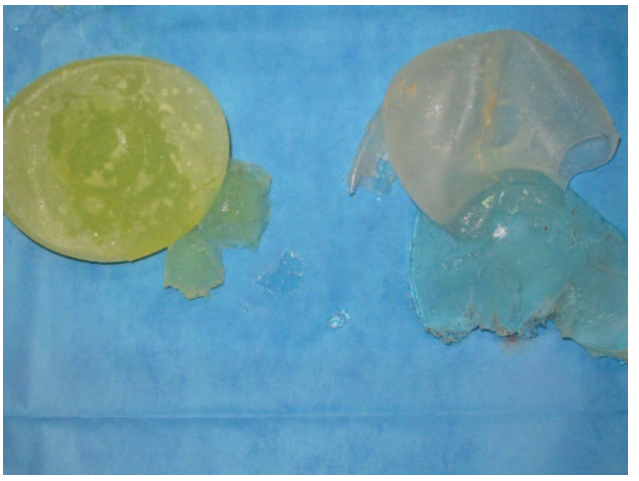

Fig. 3. Implants immediately following extraction.

were placed in the subpectoral pocket (left, 335 cm^3; right, 375 cm^3). The patient made a good postoperative recovery, and after 3 weeks, the rash on the trunk and breast mound resolved. There was no pathological evidence of malignancy in the capsules.

Chemical analysis confirmed that both implants were filled with fraudulent silicone gels and that some differences arose from the left and right implant. According to the report of AFFSAPS-ANSM,[1] the rheology of the gels differs from an authorized silicone source (eg, Nusil) and homemade PIP gels (Fig. 4). The PIP gels are denser and more cross-linked than the Nusil one, thus less prone to retain the silicone fluid inside the implant after a membrane rupture. In addition, GC-MS analyses showed that the left PIP implant contained more small molar mass organic compounds (including cyclosiloxanes and linear oligomers of different molar masses) than

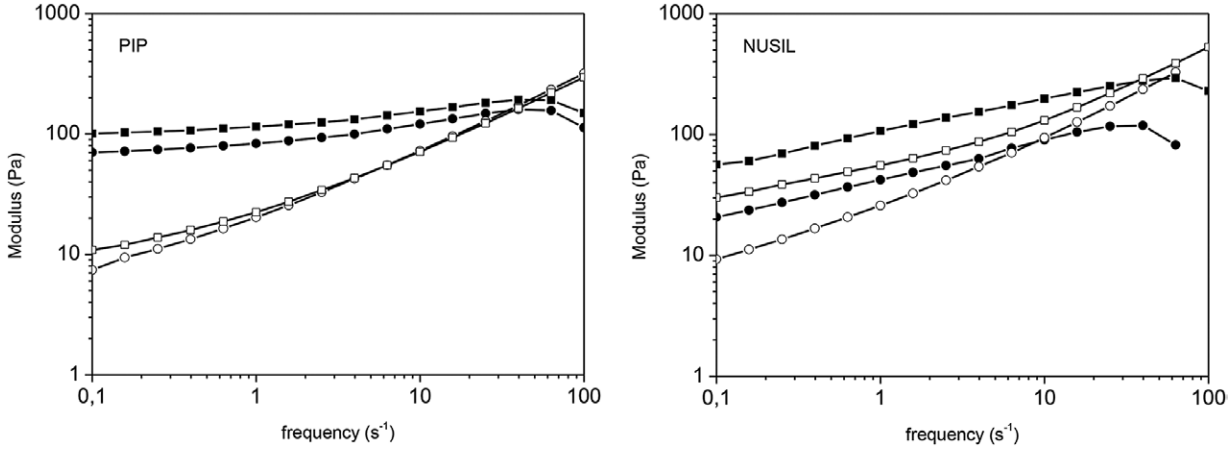

Fig. 4. Rheology of the 2 implants (A) and comparison with an official Nusil gel prepared at 2 different A:B proportions (B). Elastic moduli are designated by plain symbols, and loss moduli are designated by open symbols.

the right PIP implant, the latter being close from the Nusil gel. Note that, in the AFFSAPS-ANSM report,[1] analyses showed that the PIP membranes prepared after 2005 did not contain the intralayer acting as a barrier for low molar mass silicones, thus also explaining frequent (and rapid) ruptures through unprevented elastomer swelling.

DISCUSSION

Implant rupture commonly presents with a clinical abnormality of the breast mound, namely, lumpiness, change in breast shape, localized skin redness or rash, tenderness or sensitivity, and swelling.[2] This case report has demonstrated an unusual delayed presentation of a rash starting distally from the implant rupture site. The mode of presentation was different from the right implant rupture. Clinical examination alone has been suggested to have low sensitivity (30%) for the diagnosis of implant rupture,[3] whereas MRI has the highest reported sensitivity at 90%.[4,5] Each PIP implant had different biochemical properties, which may be due to the fraudulent nature of the manufacturing process. This case report highlights the fact that implant rupture can potentially present in an unusual way.

LEARNING POINTS

PIP implant rupture can present late.

The skin rash secondary to implant rupture can occur distal to the breast.

The properties of biochemical silicone products in PIP implants can result in varying modes and severity of clinical presentation.

PATIENT CONSENT

The patient provided written consent for the use of her image.

Fabien Reyal
Institut Curie
26 rue d'Ulm
Paris 75005, France
E-mail: fabien.reyal@curie.net

REFERENCES

1. Anon. State of the Art on the Controls Operated by the French Health Authorities Regarding the Poly Implant Prothèse Company, AFSSAPS Final Report (in French). Available at: http://www.sante.gouv.fr/IMG/pdf/Rapport_complet_PIP_def_01_02_12.pdf. Accessed February 2012.
2. Bondurant S, Ernster V, Herdman R. *Safety of Silicone Breast Implants. Institute of Medicine (US) Committee on the Safety of Silicone Breast Implants. Chapter 5*. Washington, DC: National Academies Press; 1999:124–178
3. Hölmich LR, Fryzek JP, Kjøller K, et al. The diagnosis of silicone breast-implant rupture: clinical findings compared with findings at magnetic resonance imaging. *Ann Plast Surg*. 2005;54:583–589.
4. Hölmich LR, Vejborg I, Conrad C, et al. The diagnosis of breast implant rupture: MRI findings compared with findings at explantation. *Eur J Radiol*. 2005;53:213–225.
5. Scaranelo AM, Marques AF, Smialowski EB, et al. Evaluation of the rupture of silicone breast implants by mammography, ultrasonography and magnetic resonance imaging in asymptomatic patients: correlation with surgical findings. *Sao Paulo Med J*. 2004;122:41–47.