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CASE REPORT
Breast

Silicone Migration and Late Hematoma following Silicone Implant Rupture: Case Report and Literature Review

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Summary: Distant silicone migration and late postoperative hematoma are rare but serious complications following breast implant rupture. This study describes a case report of both these complications occurring in the same patient. After a review of pertinent literature, the authors found 19 other case reports (20 total patients) with distant silicone migration following breast implant rupture. Median age at the time of presentation was 48 years (range, 21–76), and median time between initial breast augmentation and presentation with silicone migration was 10 years (range, 1–30 years). Sites of migrated silicone included arm/forearm (n = 11), thoracic cavity (n = 4), abdominal wall (n = 3), legs (n = 2), and back (n = 1). A total of 67% of patients had documented trauma to the chest before presentation. Our study highlights the need to consider distant silicone migration in the differential diagnosis when extracapsular implant rupture is suspected. *(Plast Reconstr Surg Glob Open 2018;6:e1849; doi: 10.1097/GOX.0000000000001849; Published online 6 August 2018.)*

Implant rupture is an important and well-described complication of breast augmentation with silicone-gel prostheses.[1–3] When implant rupture is confined to the periprosthetic capsule, patients tend to be asymptomatic, though some may complain of tightness, implant distortion, and pain.[1] Extracapsular spread of silicone tends to cause more problems clinically, due in part to the potential for granulomatous inflammation of local tissues when in contact with ruptured implant contents.[4] Rarely, silicone gel from ruptured implants can migrate to more distant locations in the body, such as the arm, torso, or legs, presenting as a subcutaneous mass with or without local tissue reaction.[5–23]

Postoperative hematoma is another known complication following breast augmentation, typically seen within the first 3 days after surgery.[24] However, delayed breast hematoma formation (> 6 months postoperatively) is exceedingly rare in this patient population. A literature review by Grippaudo et al.[25] found that only 31 patients have been described in the literature who developed a delayed hematoma after undergoing cosmetic augmentation mammaplasty. We present a patient with a delayed breast hematoma and distant silicone migration to the right arm following bilateral implant rupture, and a review of the literature for the latter complication.

CASE REPORT

A 65-year-old woman with a history of bilateral silicone breast augmentation in 1987 and hypertension presented to clinic with swelling and discomfort of her inferior left breast (Fig. 1). She stated that the symptoms began after a motor vehicle collision 3 years prior. Since that time, the left breast implant had slowly developed significant swelling inferiorly, along with pain and tenderness of the overlying skin. She had initially presented to an outside institution for management, but, due to insurance reasons, could not obtain definitive management. She then presented to our institution nearly 3 years after the initial traumatic injury, during which time she remained hemodynamically stable and asymptomatic with regard to anemia.

Physical examination of the breasts revealed significant capsular contractures bilaterally along with a large,

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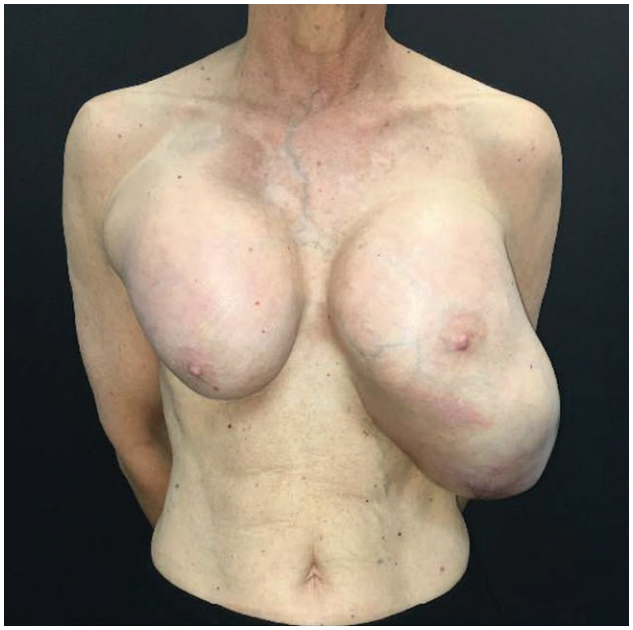


Fig. 1. Preoperative presentation of the patient.

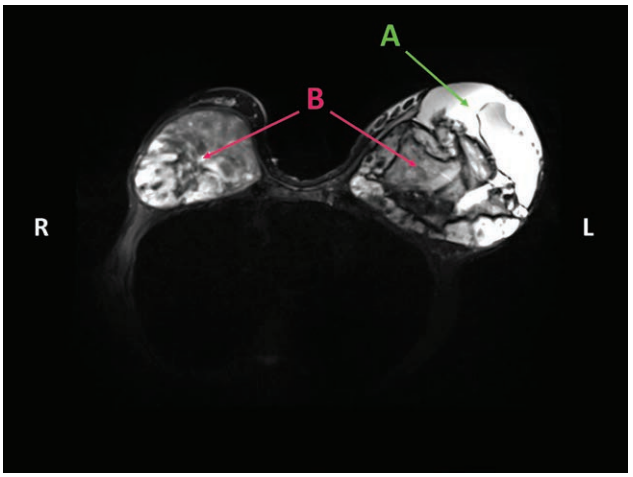


Fig. 2. Preoperative magnetic resonance imaging demonstrating the left breast hematoma (A) and bilateral implants (B).

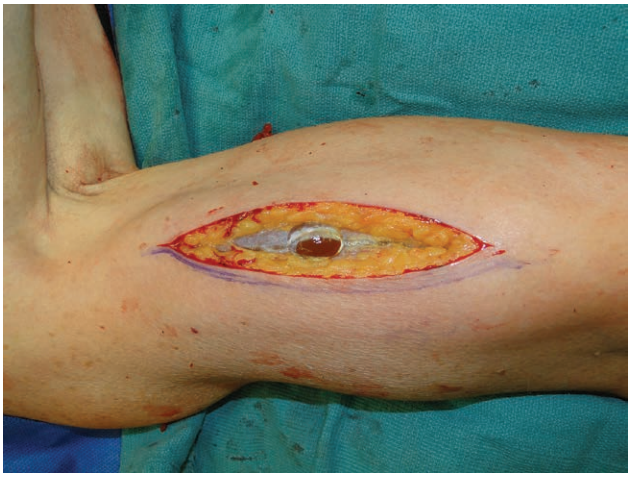
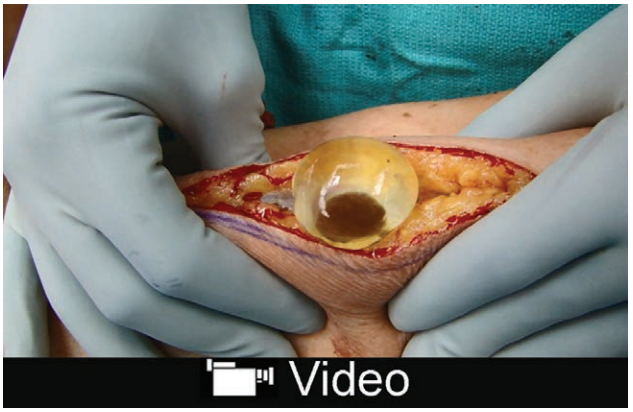


Fig. 3. Intraoperative photograph demonstrating the protruding silicone after incision over the right bicipital groove.



Video Graphic 1. See video, Supplemental Digital Content 1, which displays manual silicone removal out of the right upper arm through the bicipital incision, ***http://links.lww.com/PRSGO/A799***.

firm, immobile soft-tissue mass of the inferior left breast with overlying skin hyperemia and hypervascularity. In the right breast, there was extensive soft-tissue fullness along superior pole with extension into the axilla. A fluctuant, nontender, 8×4 cm soft-tissue mass was palpated within the right upper arm, overlying the medial aspect of brachialis muscle. No accompanying skin changes were seen over the mass. The patient denied systemic (type B) symptoms, skin breakdown, nipple discharge, or retraction, palliating the initial concern for cancerous neoplasm. Her last mammogram was approximately 3 years before presentation and showed no signs of malignancy. She had no prior history of breast cancer. She denied taking any medication with anticoagulant or antiplatelet activity.

Magnetic resonance imaging of the breasts demonstrated large, heterogeneous, oval-shaped masses within the retropectoral spaces bilaterally, concerning for malignancy (Fig. 2). There was also evidence of a fluid collection within the left breast. T1-weighted magnetic resonance images of the right hemithorax showed areas of abnormal high signal intensity, consistent with extracapsular silicone implant rupture extending into the right axilla and upper extremity (Fig. 2). Due to initial suspicion of malignancy, a core biopsy was performed on the inferior left breast mass, which demonstrated benign pathology consistent with an organized hematoma.

The patient was taken to the operating room for bilateral implant removal and total capsulectomy. Complete rupture of the right implant was found, with extrusion of silicone material through the right axilla and upper extremity. An organized hematoma containing fibrinous material and silicone granulomas was evacuated from the right breast, with a total volume of approximately 200 mL. The extruded silicone was removed through an incision within the right bicipital groove (Fig. 3; **see video, Supplemental Digital Content 1**, which displays manual silicone removal out of the right upper arm through the bicipital incision, ***http://links.lww.com/PRSGO/A799***). In the left breast, a ruptured 300 cc silicone implant was found in-

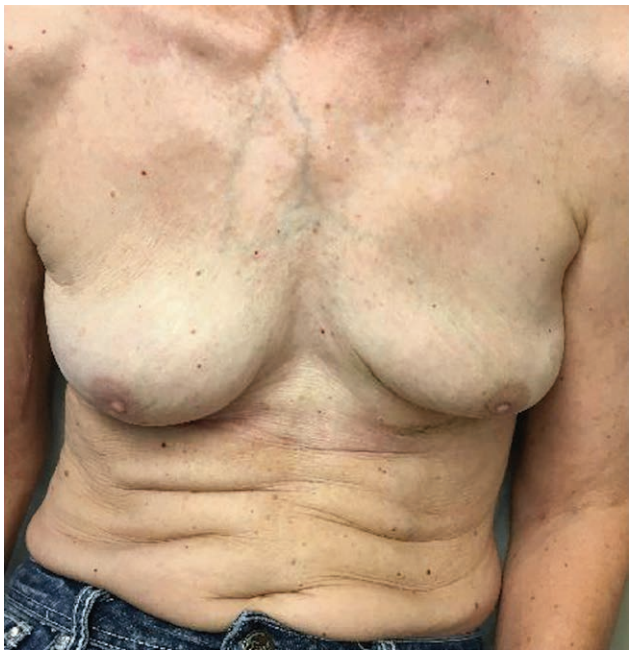


Fig. 4. Photograph of the patient 1 month postoperatively.

side a fibrous capsule. A large volume of organized hematoma (~600 cc) was removed piecemeal from the inferior aspect of the left breast, and the hyperemic overlying skin was discarded. Bilateral gross specimens were sent for final pathology, both showing benign hematoma with scattered granulomatous reaction; specific staining for anaplastic large-cell lymphoma was negative. All incisions were closed primarily, with drains placed into each breast pocket.

Postoperatively, the patient received 4 units of packed red blood cells due to significant blood loss during the hematoma removal, but otherwise recovered well with no acute events or evidence of hemodynamic instability. At follow-up 1 month later, the patient was doing well, with no further complaints or complications (Fig. 4).

LITERATURE REVIEW

Methods

A literature review was performed to find reported cases of distant silicone migration following breast implant rupture.[5–23] Descriptive statistics were calculated using the present case, and all but 1 reported case for which individual patient data were not provided.[8] The year of initial silicone implant placement was either reported for each case or estimated by year of article publication.

Results

In addition to our own case report, a total of 20 patients from 19 case reports were found. The qualitative and quantitative results of this review can be seen in Table 1 (http://links.lww.com/PRSGO/A839). Median age was 48 years (range, 21–76). Median time between initial breast augmentation and eventual presentation was 10 years (range, 1–30 years). Sites of migrated silicone included arm/forearm (n = 11), thoracic cavity (n = 4), abdominal wall (n = 3), legs (n = 2), and back (n = 1). A total of 67% of patients had documented trauma to the chest before presentation.

DISCUSSION

This case exemplifies the range of complications seen after silicone implant rupture and the importance of prompt diagnosis and intervention. The delay (3 years) between documented chest trauma and surgical intervention likely allowed the corresponding hematoma to expand and incorporate. It is also possible that the initial silicone extravasation resulted in a chronic lymphocytic granulomatous reaction, which then lead to recurrent acute-on-chronic hematoma. This likely necessitated the significantly more invasive procedure requiring blood transfusion. Although surgeons must promptly diagnose and treat implant rupture, this case also argues for patient education; patients should be educated on the signs and symptoms of implant rupture and should return to care if observed.

It should be noted that many of the implants involved in this series were from the 1970s to early 1990s, before the evolution of highly cohesive implants. It will be interesting to see if the trends in implant cohesion correlate with rates of distant silicone migration following implant rupture.

The extravasation of silicone into the right arm in this case, and the array of distant silicone sites presented in the literature review, serves as a reminder to complete a comprehensive physical examination when implant rupture is suspected. The distant sites of extravasation may not be captured by diagnostic imaging and could be easily neglected without careful examination.

CONCLUSIONS

This case emphasizes the importance of prompt treatment and diagnosis of silicone implant rupture by demonstrating the complications with delay in care. The distant migration of silicone presented in this case, and literature review, illustrates the need for a thorough physical examination when ruptured implants are suspected.

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REFERENCES

1. Handel N, Garcia ME, Wixtrom R. Breast implant rupture: causes, incidence, clinical impact, and management. *Plast Reconstr Surg.* 2013;132:1128–1137.
2. Brown SL, Silverman BG, Berg WA. Rupture of silicone-gel breast implants: causes, sequelae, and diagnosis. *Lancet.* 1997;350:1531–1537.
3. Hölmich LR, Friis S, Fryzek JP, et al. Incidence of silicone breast implant rupture. *Arch Surg.* 2003;138:801–806.
4. Austad ED. Breast implant-related silicone granulomas: the literature and the litigation. *Plast Reconstr Surg.* 2002;109:1724–1730; discussion 1731.

5. Capozzi A, Du Bou R, Pennisi VR. Distant migration of silicone gel from a ruptured breast implant. Case report. *Plast Reconstr Surg*. 1978;62:302–303.
6. Puckett MA, DeFriend D, Williams MP, et al. A leaking breast prosthesis presenting as an abdominal mass. *Br J Radiol*. 2004;77:790–791.
7. Yoo H, Shin SJ, Park MC. Migration of a ruptured, silicone gel-filled breast implant into sternal and abdominal areas. *Arch Aesthetic Plast Surg*. 2014;20:178–181.
8. Dragu A, Theegarten D, Bach AD, et al. Intrapulmonary and cutaneous siliconomas after silent silicone breast implant failure. *Breast J*. 2009;15:496–499.
9. Hirmand H, Hoffman LA, Smith JP. Silicone migration to the pleural space associated with silicone-gel augmentation mammaplasty. *Ann Plast Surg*. 1994;32:645–647.
10. Stevens WM, Burdon JG, Niall JF. Pleural effusion after rupture of silicone bag mammary prosthesis. *Thorax*. 1987;42:825–826.
11. Taupmann RE, Adler S. Silicone pleural effusion due to iatrogenic breast implant rupture. *South Med J*. 1993;86:570–571.
12. Ahn CY, Shaw WW. Regional silicone-gel migration in patients with ruptured implants. *Ann Plast Surg*. 1994;33:201–208.
13. Anderson DR, Schwartz J, Cottrill CM, et al. Silicone granuloma in acral skin in a patient with silicone-gel breast implants and systemic sclerosis. *Int J Dermatol*. 1996;35:36–38.
14. Foster WC, Springfield DS, Brown KL. Pseudotumor of the arm associated with rupture of silicone-gel breast prostheses. Report of two cases. *J Bone Joint Surg Am*. 1983;65:548–551.
15. Huang TT, Blackwell SJ, Lewis SR. Migration of silicone gel after the "squeeze technique" to rupture a contracted breast capsule. Case report. *Plast Reconstr Surg*. 1978;61:277–280.
16. Mason J, Apisarnthanarax P. Migratory silicone granuloma. *Arch Dermatol*. 1981;117:366–367.
17. Masson CL, Dessapt B, Rochet M. [Migration of silicone gel after rupture of a breast prosthesis during an external capsulotomy]. *Ann Chir Plast*. 1982;27:369–373.
18. Persellin ST, Vogler JB 3rd, Brazis PW, et al. Detection of migratory silicone pseudotumor with use of magnetic resonance imaging. *Mayo Clin Proc*. 1992;67:891–895.
19. Sanger JR, Matloub HS, Yousif NJ, et al. Silicone gel infiltration of a peripheral nerve and constrictive neuropathy following rupture of a breast prosthesis. *Plast Reconstr Surg*. 1992;89:949–952.
20. Teuber SS, Ito LK, Anderson M, et al. Silicone breast implant-associated scarring dystrophy of the arm. *Arch Dermatol*. 1995;131:54–56.
21. Oh JH, Song SY, Lew DH, et al. Distant migration of multiple siliconomas in lower extremities following breast implant rupture: case report. *Plast Reconstr Surg Glob Open*. 2016;4:e1011.
22. Sagi L, Baum S, Lyakhovitsky A, et al. Silicone breast implant rupture presenting as bilateral leg nodules. *Clin Exp Dermatol*. 2009;34:e99–101.
23. Baack BR, Wagner JD. Silicone gel breast implant rupture presenting as a fluctuant back mass after latissimus dorsi breast reconstruction. *Ann Plast Surg*. 2003;51:415–418.
24. Collins JB, Verheyden CN. Incidence of breast hematoma after placement of breast prostheses. *Plast Reconstr Surg*. 2012;129:413e–420e.
25. Grippaudo FR, Renzi L, Costantino B, et al. Late unilateral hematoma after breast reconstruction with implants: case report and literature review. *Aesthet Surg J*. 2013;33:830–834.