

Distant Migration of Multiple Siliconomas in Lower Extremities following Breast Implant Rupture: Case Report

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Summary: Siliconoma from ruptured breast implants has been reported in multiple body sites, including but not limited to the breast parenchyma, axillary lymph nodes, upper arm, and even lower leg. In this regard, we report a rare case of distant silicone migration to the lower extremities after traumatic breast implant rupture. A 55-year-old Asian woman who received bilateral augmentation mammoplasty 20 years ago presented with ruptured breast implants from a car accident 2 years earlier. Magnetic resonance imaging confirmed intracapsular and extracapsular rupture of the right breast implant, showing “linguine sign.” We removed the bilateral breast implants and performed capsulectomy and bilateral reduction mammoplasty using inverted-T incisions. The implant was confirmed as a smooth, silicone gel-filled mammary implant of 125 cm³ by a Japanese manufacturer, Koken. During her regular follow-up outpatient visits, physical examination revealed 2.5- × 1.5-cm ill-defined, tender, subcutaneous nodules on both knees and 8.5- × 3.0-cm inflammatory changes in the inguinal area with persistent pain. Computed tomography showed no definite mass, but rather infiltrative, nonenhancing soft-tissue densities in the subcutaneous layers of the bilateral inguinal and knee areas. Surgical excision was performed, and pathologic findings confirmed variable vacuoles with foreign body reaction and fibrosis, consistent with siliconoma. It is important to acknowledge that siliconomas can be encountered in patients with ruptured breast implants, especially those manufactured decades ago. Our patient with masses as remote as the inguinal and knee areas is a prime example of how far siliconomas can migrate. (*Plast Reconstr Surg Glob Open* 2016;4:e1011; doi: 10.1097/GOX.0000000000001011; Published online 27 October 2016.)

Although a variety of complications of silicone-filled breast implants have been explored, relatively little has been highlighted about the fate of silicone gel that accidentally or unnoticeably escapes from the implant shell. Before the introduction of strict and rigorous regulations driven by the Food and Drug Administration and the American Society for Testing and Materials in the early 1990s, second-generation silicone implants had long been known for their notorious silicone molecule bleed because of low-viscosity gel within thin and permeable shells.

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A number of reports ensued regarding silicone granulomas found adjacent to these breast implants, such as in the breast parenchyma, the chest wall, and axillary lymph nodes.¹⁻³ However, distant silicone migration from a ruptured implant shell is still a rare event that has been only intermittently published and, if at all, mostly in the form of case reports. Silicone granulomas have been found in various remote sites of the body, including but not limited to the upper arm, abdomen, lower leg, and even ankle.^{2,4,5}

In this regard, we report another rare case of distant silicone migration to lower extremities after traumatic breast implant rupture.

CASE PRESENTATION

A 55-year-old Asian woman who received bilateral augmentation mammoplasty in 1995 at a local clinic was referred to us with concern that her breast implants might have been ruptured in a car accident 2 years earlier when

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a seat belt strongly tightened across her anterior chest. Bilateral masses around the subareolar area were found on physical examination, with erythematous and frail skin changes. The breasts were symmetric, measuring 650 cm³ for each side, with obviously ptotic appearance (Fig. 1). Magnetic resonance imaging confirmed intracapsular and extracapsular rupture of the right breast implant, exhibiting typical lobulated capsular contour, or “linguine sign” (Fig. 2). We decided to surgically remove the bilateral breast implants, and, at the time of removal, the right-sided implant envelope was found broken with obvious silicone gel leakage, and copious saline irrigation was used to wash out the remaining silicone gel. Conversely, the left-sided envelope remained intact.

We also simultaneously performed a capsulectomy and a bilateral superior-pedicled reduction mammoplasty using inverted-T incisions, because her remaining breasts were still large and ptotic. The amount of reduction was 181 g on the right side and 209 g on the left side. The recovery was uneventful, and the patient was content with the result. The implant was confirmed as a smooth-walled, silicone gel-filled mammary implant 125 cm³ in volume, manufactured by a Japanese company, Koken (Fig. 3). Bilateral subareolar masses were also excised, and histological examination later reported siliconoma.

Over the course of the next 9 months during her regular follow-up outpatient visits, the patient began to complain about lateral bulging of the right breast, persistent pain in the bilateral inguinal areas, and mass-like lesions on the medial aspect of each knee. These progressive lesions showed skin hyperpigmentation without any erythematous change or fluidic discharge (Fig. 4). The patient claimed that she had never received any cosmetic procedures involving direct silicone liquid injection, and



Fig. 2. A smooth, 125-cm³ silicone gel-filled mammary implant (Koken) removed from left breast.



Fig. 3. Inguinal tender lesions with skin hyperpigmentation.



Fig. 1. Axial (L) and sagittal (R) views of magnetic resonance imaging scan showing intracapsular and extracapsular rupture of the right implant.

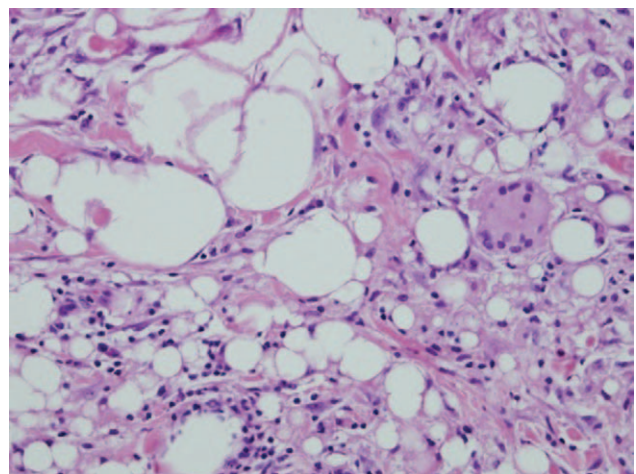


Fig. 4. Histologic examination revealed mixed cell granuloma with cystic cavities containing silicone (hematoxylin-eosin stain 200x).

it seemed credible given that injections to those unusual locations would hardly provide any aesthetic benefit to the patient. Physical examination revealed 8.5- × 3.0-cm inflammatory changes in the bilateral inguinal areas and 2.5- × 1.5-cm ill-defined, solid, tender, subcutaneous nodules on both knees. Computed tomography showed no definite mass, but rather diffuse, infiltrative, nonenhancing soft-tissue densities in the subcutaneous layers of the bilateral inguinal and knee areas.

Surgical excision was performed on the masses in the right lateral breast and bilateral inguinal and knee areas, and no involvement of fascia or muscle was found. Pathologic findings confirmed extensive, variably sized vacuoles with foreign body reaction and fibrosis, consistent with siliconoma. The patient no longer complained of pain and showed no other new or relapsing lesions over the following 2 postoperative years.

DISCUSSION

It has already been concluded that silicones do not cause abnormal immune response or autoimmune disease.⁶ Instead, the immune system attempts to separate the foreign material, which results in a mass, a siliconoma. Very few authors have reported on such siliconomas detected in other parts of the body, but Sagi et al⁵ illustrated lesions found on the shins and ankles of a patient whose bilateral silicone breast implants ruptured. Other sites of migration include the antecubital fossa, upper arm, chest, and the abdominal wall as low as the inguinal area.^{1,2,7,8} As shown in our clinical case, most cases of distant migrations occurred in patients with obvious implant rupture, and it usually took several months for the substances to move. Silicone material starts to migrate once it leaks out of the ruptured implant and continues its slow journey to distant sites regardless of the removal of ruptured implant, which usually follows later.

The exact mechanism of remote migration is not sufficiently understood, but it has been suggested that absorbed silicone molecules may follow vascular spread through either the vessel sheath or blood flow; additionally, it has been postulated to travel with lymphatic flow. It has also been suggested that in vivo silicone biodegradation rendered the gel less viscous, allowing it to disperse more freely throughout subcutaneous tissue.^{1,4}

The implants removed from our patient were produced by a Japanese company, Koken, also known as Porex in the United States. Koken presumably distributed gel implants with fluid and compliant gel,⁹ but the exact physical and chemical properties of the gel are not available because the company is no longer an active manufacturer of breast implants. Porex products were once

mentioned in an article about the issue of delamination,¹⁰ but the article did not mention gel spillage issues or distant siliconomas in particular.

It is important and relevant, however, to acknowledge that siliconomas can be encountered in patients with ruptured breast implants, especially those prosthetics manufactured decades ago. The subcutaneous masses of siliconomas can be a source of confusion, even to a pathologist, without the knowledge of previous silicone exposure of the patient, as in a case initially diagnosed as factitial panniculitis.²

Our patient with masses as remote as the inguinal and knee areas is a prime example of how far siliconomas can migrate, and clinicians should always take into account the possibility of siliconoma in differential diagnosis for these masses at even seemingly unlikely locations.

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