

Silicone Migration after Buttock Augmentation

Rafael Biguria, MD*
Otto Rolando Ziegler, MD†

Summary: We present the case of a 30-year-old woman who presented with enlarged inguinal lymph nodes and sacral hyperpigmentation 4 months after gluteal augmentation with silicone implants. Inguinal lymph node biopsy revealed granulomatous lymphadenitis due to foreign material. Upon right buttock implant revision, a 1.5-cm-thick capsule was noted with the absence of peri-implant inflammatory fluid and no macroscopic implant defects. Analysis of the implant by the manufacturer revealed a microscopic silicone leak. The patient's recovery was uneventful, and her symptoms resolved shortly after her reoperation. (*Plast Reconstr Surg Glob Open* 2017;5:e1583; doi: 10.1097/GOX.0000000000001583; Published online 28 December 2017.)

Siliconoma secondary to ruptured breast implants has been reported in multiple body sites. The sensitivity of physical examination for detecting silicone implant rupture may be as low as 30%,¹ although the diagnosis is easier when capsular contracture is present.²

Silicone leak can remain confined to the breast or spread to regional lymph nodes³⁻⁶ and even to remote organs where it leads to foreign body inflammation⁷⁻¹¹ and sometimes mimics neoplastic disorders on imaging studies.¹²⁻¹⁴

CASE REPORT

A 30-year-old female patient with history of gluteal hypoplasia, who rejected gluteal augmentation with autologous fat transfer (Fig. 1), underwent gluteal augmentation using silicone implants. Two 300-cm³ Silimed silicone buttock implants were used. An intramuscular pocket was created to insert the implants. Closed suction drains were used on each side and taken on postoperative day 5 when their output was below 30 cm³/24h. Prophylactic antibiotic treatment with a third generation cephalosporine was given for 7 days. One month after surgery, the patient started to feel induration of the right buttock. Four months after surgery, after sleeping, the patient developed bruising around her right buttock and dark pigmentation in the sacral region (Fig. 2).

The patient presented for evaluation, and at physical examination, enlarged bilateral inguinal lymph nodes were noticed. No systemic signs or symptoms were no-

ticed. Ultrasound examination did not reveal any fluid collections or structural problems with the implant. She was scheduled for a biopsy on her left inguinal nodes (4 mo after her initial surgery). A 2-cm enlarged lymph node was sent to pathology where it was reported as a sinusoidal congestion, amorphous material with abundant foamy macrophages and giant multinucleated cells, findings consistent with granulomatous lymphadenitis due to foreign material, probably silicone (siliconoma) (Fig. 3).

Revision of the right buttock implant was performed, finding a 1.5-cm-thick capsule with no peri-implant inflammatory fluid and no macroscopic defects of the implant. Because of the risk of nerve and vascular damage, a capsulotomy instead of a capsulectomy was performed, and a new silicone 300-cm³ Silimed implant was inserted. The explanted implant was sent to the manufacturer for analysis.

One month after reintervention, the patient's inguinal adenopathy, and pigmented lesion had resolved. The analysis of the implant revealed a microscopic leak, and patient was accredited its insurance by the manufacturer (Fig. 4).

DISCUSSION

Most of the literature case reports regarding silicone migration is from breast implants. To our knowledge, this is the first case report describing distant migration of silicone after gluteal implants.

There is increasing awareness of adverse effects and complications of implants containing silicone. Such complications mainly involve local reactions to silicone "sweating" from the implant (also known as gel bleed) and frank rupture. However, silicone leakage has also been associated with locoregional and systemic effects such as histiocytic necrotizing lymphadenitis, and even autoimmune and connective tissue diseases have been proposed.

From *Renova Hospital, Guatemala, Guatemala; and †Ziegler & Ziegler Clinic, Lima, Peru.

Received for publication June 13, 2017; accepted October 3, 2017.

Copyright © 2017 The Authors. Published by Wolters Kluwer Health, Inc. on behalf of The American Society of Plastic Surgeons. This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), 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 without permission from the journal.

DOI: 10.1097/GOX.0000000000001583

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. Posterior and lateral views of the patient's buttock.



Fig. 2. Patient buttocks showing bruising in her right buttock and dark pigmentation around sacral region 4 months after surgery.

Commonly a fibrous capsule forms around the silicone implants, as we encountered with our patient. There is, however, *in vivo* and *in vitro* evidence that silicones may migrate into and through these capsules. On the other hand, rupture of the capsules may occur by accident or closed capsulotomy (squeezing until the capsule ruptures, a once-accepted method of disrupting a hard-tissue capsule), which may facilitate migration of silicones into the surrounding tissue.¹⁵⁻¹⁷

Once outside the envelope, silicones may disperse through soft tissue, lymph nodes, or vasculature to distant sites. Although this may happen, it does not need to occur. Singh et al.¹⁸ reported granuloma after the injection of silicone gel to gluteal implants. No enlarged lymph nodes were reported in this case, but there were systemic effects such as fever and leukocytosis.

Sinno et al. studied buttock augmentation until April 2015 from several database studies. They found that the most commonly reported complications in 2375 patients receiving

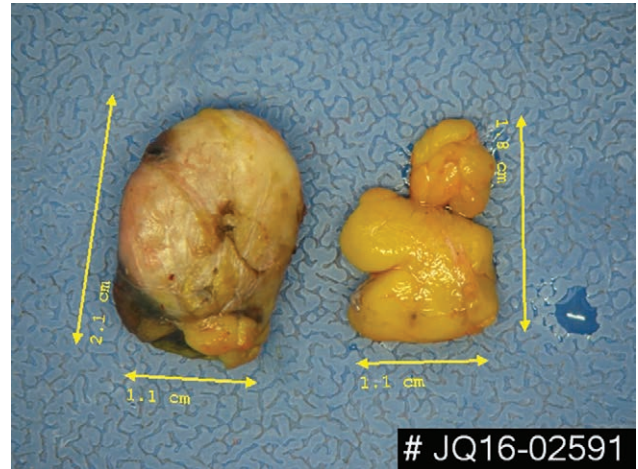


Fig. 3. Macroscopic view of lymph node.

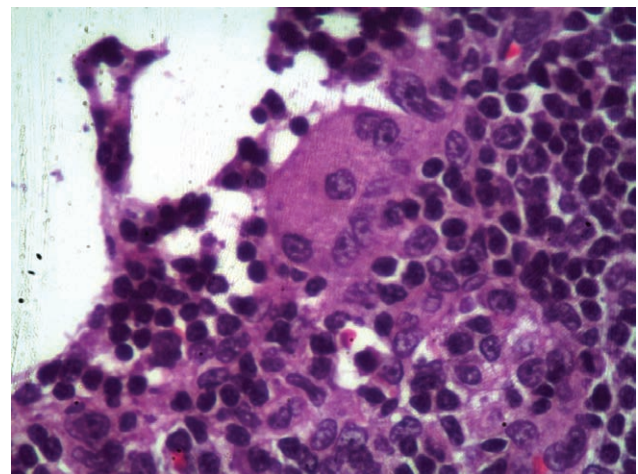


Fig. 4. Microscopic view of lymph node biopsy showing giant multinucleated cells and foamy macrophages.

silicone implants were wound dehiscence (9.6%), seroma (4.6%), infection (1.9%), and transient sciatic paresthesias (1.0%), with an overall complication rate of 21.6%.¹⁹ No distant silicone complications were reported using implants.

Daniel et al. studied the durability of gluteal implants in 380 patients. They found that in 70 reoperated on patients, only 2.8% presented with intact implants.²⁰ Although there is no description regarding the other 310 patients, this is a high percentage of implant rupture. However, the cause of reoperation or clinical findings in these patients is not mentioned, hindering the ability to note important clinical characteristics to ruptured implants. They did, however, use nuclear magnetic imaging for the diagnosis. In our patient, because of economic issues, no magnetic resonance imaging was done.

The introduction of highly cohesive silicone gel implants includes a greater durability of overall shape and a reduction in the incidence of outer shell folding. The safety profile also improved with the greater degree of gel viscosity by limiting migration and locoregional spread of silicone gel after a compromised implant shell. Since the introduction of high cohesive gel implants in 1993, there

have been few cases of regional spread and axillary lymph node involvement after capsular rupture of a high cohesive gel implant. It seems that early implant failure is rare, but despite the increased gel viscosity, the potential for regional migration remains. Studies suggest the growing awareness for this phenomenon and emphasize the need for continued vigilance for signs and symptoms of migration despite the greater degree of gel cohesiveness.⁶

After surgical implantation, breast implants move about to a varying degree. The continuous presence of this gliding foreign object induces changes in the innermost layer of fibroblastic cells surrounding the implant, resembling normal joint synovium. These cellular changes receive the name of synovial metaplasia, and it has been especially reported around implants with textured surface.²¹

Granuloma as a reaction to silicone (sometimes referred to as siliconomas) will mainly be found after extracapsular rupture of an implant and after silicone injections with silicones. Such silicone granulomas may present as a tumor, sometimes some distance from the implant. In case of injections, the histological pattern seems to be numerous cystic spaces and vacuoles partly filled with silicones surrounded by a thin layer of fibrous tissue, with only minimal foreign body giant cell reaction. In case of extracapsular rupture, there may be many giant cells of the foreign body type, often containing silicones, and foam cells as well as lymphocytes.²²⁻²⁵

The association between silicone breast prostheses and systemic diseases is a highly controversial issue. Till now, most epidemiologic studies found no association between breast implants and a variety of connective tissue diseases, despite the fact that Brown et al.²⁶ have published a statistically significant link between ruptured silicone gel implants and fibromyalgia, and also other autoimmune diseases.

The presence of silicone droplets in lymph nodes of patients with breast implants suggests that the transit of various elements, either synthetic or biologic, from breast tissue to lymph nodes via lymphatic channels may have significant passive component, which may be crucial in the metastatic component in breast cancer.¹³

CONCLUSIONS

Early microvascular rupture on silicone implants should be addressed or treated accordingly. Some signs that may suggest this entity may be skin color changes, capsular contraction, or distant lymphadenopathy as seen with our patient.

Rafael Biguria, MD

3a calle A 8-38 zona 10, Edificio Renova
Tercer nivel. Guatemala
Guatemala

E-mail: rbiguria@hotmail.com

REFERENCES

- Hölmich LR, Fryzek JP, Kjølner 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.
- Paetau AA, McLaughlin SA, McNeil RB, et al. Capsular contraction and possible implant rupture: is magnetic resonance imaging useful? *Plast Reconstr Surg.* 2010;125:830-835.
- Truong LD, Cartwright JJ, Goodman MD, et al. Silicone lymphadenopathy associated with augmentation mammoplasty. Morphologic features of nine cases. *Am J Surg Pathol.* 1988;12:484-491.
- Rivero MA, Schwartz DS, Mies C. Silicone lymphadenopathy involving inframammary lymph nodes: a new complication of silicone mammoplasty. *AJR Am J Roentgenol.* 1994;162:1089-1090.
- Shipchandler TZ, Lorenz RR, McMahon J, et al. Supraclavicular lymphadenopathy due to silicone breast implants. *Arch Otolaryngol Head Neck Surg.* 2007;133:830-832.
- Kaufman CJ, Sakr RA, Inguenault C, et al. Silicone migration to the contralateral axillary lymph nodes and breast after highly cohesive silicone gel implant failure: a case report. *Cases J.* 2009;2:6420.
- Pfleiderer B, Garrido L. Migration and accumulation of silicone in the liver of women with silicone gel-filled breast implants. *Magn Reson Med.* 1995;33:8-17.
- Prebtani AP, Asa SL, Ezzat S. Is granulomatous thyroiditis a complication of breast implants? *Endocr Pathol.* 2002;13:239-244.
- Levine RL, Allen TC, Cartwright JJ, et al. Silicone thorax due to a ruptured breast implant. *Chest* 2005;127:1854-1857.
- Dragu A, Theegarten D, Bach AD, et al. Intrapulmonary and cutaneous siliconomas after silent silicone breast implant failure. *Breast J.* 2009;15:496-499.
- Paredes Vila FJ, Gonzalez Barcala J, Suarez Antelo M, et al. Pneumonitis caused by silicone gel following breast implant rupture. *Ir J Med Sci.* 2010;179:141-145.
- Gil T, Mettanes I, Aman B, et al. Contralateral internal mammary silicone lymphadenopathy imitates breast cancer metastasis. *Ann Plast Surg.* 2009;63:39-41.
- Winer LH, Sternberg TH, Lehman R, et al. Tissue reactions to injected silicone liquids. A report of three cases. *Arch Dermatol.* 1964;90:588-593.
- van Diest PJ, Beekman WH, Hage JJ. Pathology of silicone leakage from breast implants. *J Clin Pathol.* 1998;51:493-497.
- Thomsen JL, Christensen L, Nielsen M, et al. Histologic changes and silicone concentrations in human breast tissue surrounding silicone breast prostheses. *Plast Reconstr Surg.* 1990;85:38-41.
- Sever CE, Leith CP, Appenzeller J, et al. Kikuchi's histiocytic necrotizing lymphadenitis associated with ruptured silicone breast implant. *Arch Pathol Lab Med.* 1996;120:380-385.
- Tabatowski K, Elson CE, Johnston WW. Silicone lymphadenopathy in a patient with a mammary prosthesis. Fine needle aspiration cytology, histology and analytical electron microscopy. *Acta Cytol.* 1990;34:10-14.
- Singh M, Solomon IH, Calderwood MS, et al. Silicone-induced granuloma after buttock augmentation. *Plast Reconstr Surg Glob Open* 2016;4:e624.
- Sinno S, Chang JB, Brownstone ND, et al. Determining the safety and efficacy of gluteal augmentation: a systematic review of outcomes and complications. *Plast Reconstr Surg.* 2016;137:1151-1156.
- Daniel MJB, Junior IM. What is the durability of gluteal prostheses? *Rev Bras Cir Plast.* 2012;27:93-6.
- Bleiweiss JJ, Copeland M. Capsular synovial metaplasia and breast implants [letter]. *Arch Pathol Lab Med.* 1995;119:115-116.
- Travis WD, Balogh K, Abraham JL. Silicone granulomas: report of three cases and review of the literature. *Hum Pathol.* 1985;16:19-27.
- Lopiccolo MC, Workman BJ, Chaffins ML, et al. Silicone granulomas after soft-tissue augmentation of the buttocks: a case report and review of management. *Dermatol Surg.* 2011;37:720-725.
- Rapaport MJ, Vinnik C, Zarem H. Injectable silicone: cause of facial nodules, cellulitis, ulceration, and migration. *Aesthetic Plast Surg.* 1996; 20:267-276.
- Brown SL, Pennello G, Berg WA, et al. Silicone gel breast implant rupture, extracapsular silicone, and health status in a population of women. *J Rheumatol.* 2001;28:996-1003.
- Katzin WE, Centeno JA, Feng LJ, et al. Pathology of lymph nodes from patients with breast implants: a histologic and spectroscopic evaluation. *Am J Surg Pathol.* 2005;29:506-511.