

Connective tissue diseases following silicone breast implantation: where do we stand?

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Silicone, which is considered biologically inert, has been used in many different types of medical devices, including tubing; breast, joint and penile implants; artificial heart valves; and intraocular lenses, among others. After a silicone implant is placed, a mild reaction to the foreign body is generally observed, followed by encapsulation (1).

Case reports of women with silicone breast implants and connective tissue disease (CTD), especially scleroderma, began to appear in English-language medical literature in the 1980s. Currently, it is widely believed that there is no association between silicone breast implants and autoimmune disease (1). However, when a patient presents with autoimmune symptoms after silicone breast implantation, the question often arises again.

Although several authors have reported the appearance of CTDs (e.g., scleroderma, Still's disease, systemic lupus erythematosus (SLE), Sjogren's Syndrome and dermatomyositis) after silicone breast implantation, several case-control studies do not show such an association. However, there are a few points that deserve attention. Silicone breast implants act as a foreign body, and inflammatory responses to silicone, such as granulomatous skin reactions to injected silicone, synovitis around silicone prosthetic joints and lymphadenopathy proximal to silicone prostheses, have been observed (2,3). Microscopic evidence of silicone has been observed far from the original site (e.g., in the liver), suggesting that a small quantity of silicone particles detaches and migrates through the lymphatic or circulatory system to other organs (1,4-6). They may act as adjuvants and start an inflammatory process in joints or activate the immune system and stimulate the production of autoantibodies (1,2).

The activation of the immune system has been demonstrated by the presence of antibodies to silicone and the presence of autoantibodies in the sera of patients with silicone breast implants. Although several studies have detected increased titers of anti-silicone antibodies, no association with clinical findings has been observed (6-10). Significantly more patients with silicone breast implants present with positive anti-DNA, Sjogren syndrome antigen B

(anti-SSB/La) and anticollagen II (6-10). Antibodies and symptoms were more evident in patients who had possessed implants for a longer time period (10).

In conclusion, silicone breast implants may act as a foreign body and elicit autoantibody production. However, thus far, no clear link between the presence of autoantibodies and symptoms has been observed.

■ AUTHOR CONTRIBUTIONS

All authors participated in the preparation and correction of the text.

■ REFERENCES

1. Levy Y, Rotman-Pikielny P, Ehrenfeld M, Shoenfeld Y. Silicone breast implantation-induced scleroderma: description of four patients and a critical review of the literature. *Lupus*. 2009;18(13):1226-32, <http://dx.doi.org/10.1177/0961203309347795>.
2. Groff CD, Schned AR, Taylor TH. Silicone-induced adenopathy eight years after metacarpophalangeal arthroplasty. *Arthritis Rheum*. 1981;24(12):1578-81, <http://dx.doi.org/10.1002/art.1780241220>.
3. Cristie AJ, Weinherger KA, Dietrich M. Silicone lymphadenopathy and synovitis. Complications of silicone elastomer finger joint prostheses. *JAMA* 1977;237(14):1463-4.
4. Anderson DR, Schwartz J, Cottrill CM, McClain SA, Ross JS, Magidson JG, Klainer A, Bisaccia E. Silicone granuloma in acral skin in a patient with silicone-gel breast implants and systemic sclerosis. *Int J Dermatol*. 1996;35(1):36-8.
5. Sergott TJ, Limoli JP, Baldwin CM Jr, Laub DR. Human adjuvant disease, possible autoimmune disease after silicone implantation: a review of the literature, case studies. *Plast Reconstr Surg*. 1986;78(1):104-14.
6. Iannello S, Belfiore F. Silicone breast prosthesis and rheumatoid arthritis: a new systemic disease: siliconosis. A case report and a critical review of the literature. *Minerva Med*. 1998;89(4):117-9.
7. Goldblum RM, Pelley RP, O'Donnell AA, Pyron D, Hegggers JP. Antibodies to silicone elastomers and reactions to ventriculoperitoneal shunts. *Lancet* 1992;340(8818):510-3, [http://dx.doi.org/10.1016/0140-6736\(92\)91710-P](http://dx.doi.org/10.1016/0140-6736(92)91710-P).
8. Teuber SS, Rowley MJ, Yoshida SH, Ansari AA, Gershwin ME. Anticollagen autoantibodies are found in women with silicone breast implants. *J Autoimmun*. 1993;6(3):367-77, <http://dx.doi.org/10.1006/jaut.1993.1031>.
9. Karlson EW, Hankinson SE, Liang MH, Sanchez-Guerrero J, Colditz GA, Rosenau BJ, et al. Association of silicone breast implants with immunologic abnormalities: a prospective study. *Am J Med*. 1999;106(1):11-19.
10. Zandman-Goddard G, Blank M, Ehrenfeld M, Gilburd B, Peter J, Shoenfeld Y. A comparison of autoantibody production in asymptomatic and symptomatic women with silicone breast implants. *J Rheumatol* 1999;26(1):73-7.

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