

# Development of Acute Seroma Around Breast Implants Following Administration of COVID-19 Vaccination

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Aesthetic Surgery Journal  
2022, Vol 42(6) NP440–NP442  
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e-mail: journals.permissions@oup.com  
<https://doi.org/10.1093/asj/sjab412>  
[www.aestheticsurgeryjournal.com](http://www.aestheticsurgeryjournal.com)

**OXFORD**  
UNIVERSITY PRESS

Editorial Decision date: November 30, 2021; online publish-ahead-of-print February 2, 2022.

As the pace of COVID-19 vaccination gathers worldwide, the number of reported adverse events related to vaccination has understandably increased.<sup>1</sup> Although the benefits of vaccination far outweigh the risks, there have been a number of reports linking vaccination to subsequent inflammation surrounding implanted foreign materials such as cosmetic hyaluronic acid filler injections<sup>2</sup> and breast implants.<sup>3,4</sup>

We present a case of a patient who had previously undergone bilateral breast augmentation who developed symptoms of a generalized immune response followed by sudden onset of peri-implant seroma following administration of her second AstraZeneca (Cambridge, UK) COVID-19 vaccination. The patient provided written consent for the use and analysis of her data.

## CASE REPORT

The patient was a 49-year-old female who had undergone cosmetic breast augmentation 17 years ago in South Africa. She had not had any reported symptoms related to her implants over this period. Four to five days following her first AstraZeneca COVID-19 vaccination, she developed a rash with pruritis and swelling in her hands and feet (Figure 1) in addition to arthralgia, joint stiffness, and fever. The intermittent skin rashes, pruritis, and swelling of her feet and hands continued from this time until the time of surgery. Following advice from the local immunization service, she was encouraged to proceed with her second dose, which was administered 12 weeks after her first immunization.

Four to five days following her second dose, she developed left breast tenderness and swelling followed

by swelling and pain to her right breast 24 hours later (Figure 2) accompanied by a recurrence of her rash and joint swelling. Initial investigations revealed bilateral peri-implant seromas. Aspiration under ultrasound guidance showed no evidence of malignancy on cytology and her CD30 and ALK immunostains were negative. Bacterial cultures were negative. A breast MRI demonstrated left implant rupture, an intact right implant and two right breast lesions, confirmed to be benign on biopsy.

She proceeded to bilateral implant removals with complete capsulectomies. At surgery, a 750-mL seroma on the left and 300-mL seroma on the right were drained. Bilateral 350-cc smooth, round Eurosilicone implants (GC Aesthetics France SAS, Dublin, Ireland) were removed with confirmed intracapsular rupture on the left (Figure 3). Intraoperatively, the patient was noted to have a significant reduction in heart rate and blood pressure following drainage of the seroma fluid. Her hypotension improved with down-titration of anesthetic agents and commencing metaraminol.

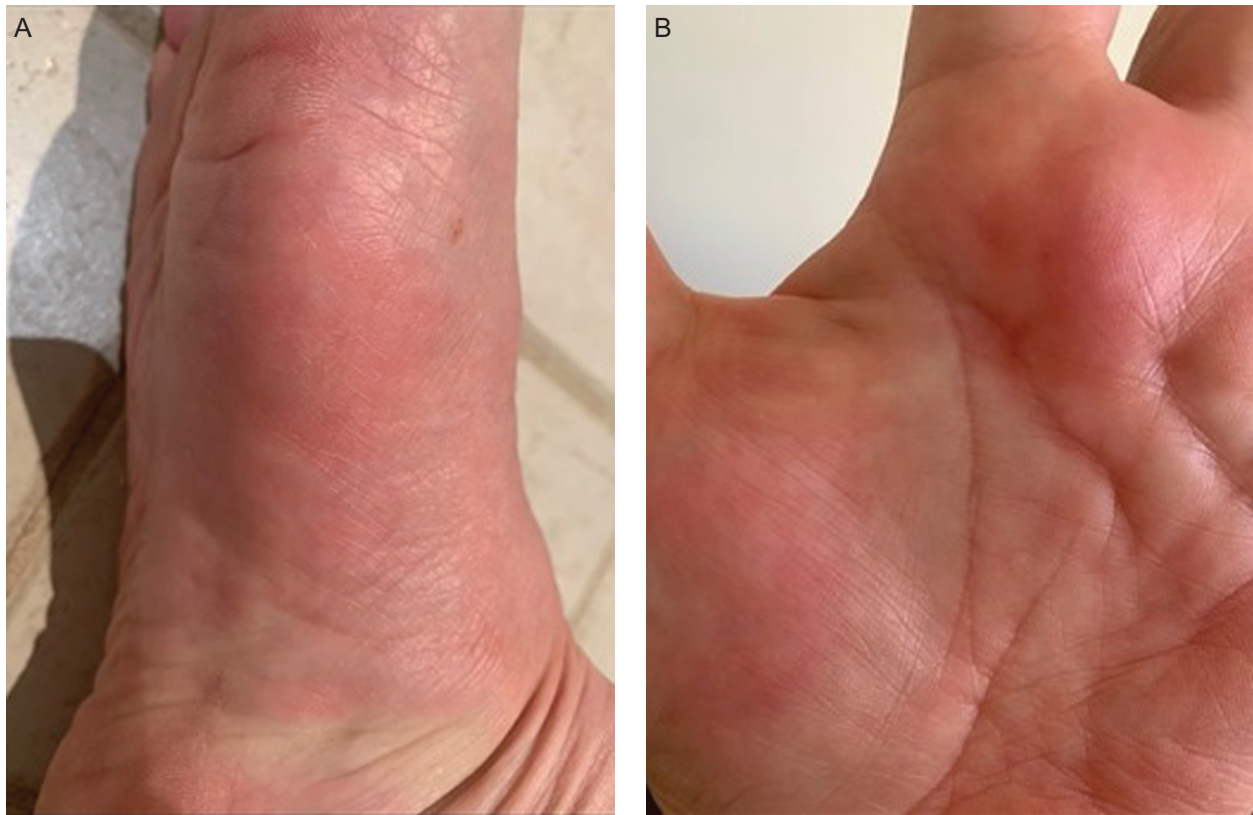
Histopathology of the capsule confirmed implant capsule characterized by dense fibrous tissue associated

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**Figure 1.** Photographs of a 49-year-old female patient's foot (A) and hand (B) showing the rash that developed following administration of the first dose of AstraZeneca COVID-19 vaccine.



**Figure 2.** Photograph of the bilateral breast swelling following administration of the second dose of AstraZeneca COVID-19 vaccine in the same 49-year-old female patient.

with an increased prominence and number of connective tissue and inflammatory cells. The inflammatory infiltrate was more pronounced in the left side. Numerous granulomata expanding the capsule wall were identified. *Staphylococcus caprae* (right) and *Corynebacterium acnes* (left) were isolated from enrichment cultures. Following surgery, her rash and hand and feet swelling and itching completely resolved.

## DISCUSSION

This case highlights the possible association of COVID-19 vaccination with a temporary widespread inflammatory reaction and subsequent acute onset of infective seroma in both breasts. The presence of a ruptured implant on the left may well have predated the onset of her symptoms but could have contributed to the more marked inflammation on the left side.

The association of chronic bacterial infection through biofilm contamination and growth and capsular contracture has been well established.<sup>5</sup> There is also some evidence to support the possible role of bacteria in breast implant–associated anaplastic large cell lymphoma<sup>6</sup> and breast implant illness.<sup>7</sup> Anything that impacts on the host's immune response, such as vaccination, may trigger bacterial growth with resulting capsular inflammation, contracture, and/or seroma. Reports of accelerated capsular contracture and pain/swelling around soft tissue fillers and breast implants raise the potential link to localized inflammation triggered by immunomodulation from vaccination.<sup>2</sup> This has been postulated to be due to the direct binding and blockade of the angiotensin 2–converting enzyme receptor by the spike protein delivered by the vaccine.<sup>8</sup> The temporal sequence of the development of acute bilateral seromas for this patient following administration of



**Figure 3.** Intraoperative photograph of the ruptured implant (bottom left), capsulectomy specimen (bottom right), and seroma fluid (top right) from the same 49-year-old female patient.

her second vaccine dose, in addition to the symptoms she experienced after her first dose, does support a progressive inflammatory trigger. Whether this was mediated by a potentiation of existing bacterial contamination or a direct inflammatory effect of the vaccine remains unclear. Although these reports are rare, we encourage women with implants receiving a vaccination to be aware of this risk and to monitor for any change to their breasts or implants following administration of COVID-19 vaccination.

### Disclosures

Dr Deva is a research coordinator for Johnson & Johnson (New Brunswick, NJ), Allergan (Irvine, CA), and KCI (3M) (St. Paul, MN). The other authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

### Funding

The authors received no financial support for the research, authorship, and publication of this article.

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