



Commentary on “Late seroma of the breast in association with COVID-19 infection: two case reports”

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Dear Editor,

With great interest, we have read the article *Late seroma of the breast in association with COVID-19 infection: two case reports* by Martínez Núñez et al. and the commentary on this article by Mungmunpantipantip et al. [1, 2]. Their articles add an important discussion on the observations which are often overlooked and represent an underreported issue which very few breast surgeons came across yet.

We would hereby like to discuss our own experience and summarize the present literature on this not very well understood topic. The COVID-19 pandemic has taught doctors not only many new lessons on potential symptoms of coronavirus infections but also on the side effects of available vaccinations. After billions of immunizations with various COVID-19 vaccines globally, we can assume that side effects are very rare and the developed vaccines are safe. During the last year, a hand full of publications, mostly case reports and letters, report breast seromas and other reactions such as inflammation and symptoms of capsular contracture in connection to acute COVID-19 disease or shortly after immunization with COVID-19 vaccines [3–8].

The very first case report on this matter was published in January 2021 describing the sudden onset of capsular contracture symptoms 2 weeks after the administration of the second dose of the Pfizer/BioNTec vaccine in an otherwise healthy patient who underwent an augmentation mastopexy with silicone implants 5 months earlier [3]. Shortly after the vaccine rollout in Europe, our group published similar observations in four patients who underwent breast

reconstruction or cosmetic breast augmentation [4, 5]. All of our patients developed symptoms after the first dose of the vaccine, independent from the product administered including BioNTec/Pfizer, AstraZeneca, or Johnson & Johnson vaccines. While implant removal was necessary for one patient due to fulminant infection, the other three patients showed recovery and symptom relief under conservative treatment with oral nonsteroidal anti-inflammatory drugs. Symptoms ranged from unilateral to bilateral axillary lymphadenitis to swelling, pain, and tenderness of the breast and seroma on ultrasound. Similar observations were published in case reports by Kayser et al. and Mak et al. a few months later [6, 8]. Van Wert et al. published another case report of one of their breast implant patients who developed a multifocal unilateral breast abscess while being in intensive care for COVID-19 disease. A surgical incision of the most symptomatic masses was performed and revealed fat necrosis without signs of malignancy or bacterial growth [7]. The most recent publication of Locklin et al. reports three more cases of patients who suffered unilateral tenderness and pain of the breast together with axillary lymphadenopathy shortly after being immunized with COVID-19 vaccines. Focal asymmetry and enlarged axillary nodes were confirmed using mammography and sonography [9]. Interestingly, in these three cases, none of the patients had a silicone breast implant. This contradicts the theory that immunologic reactions against foreign bodies such as hyaluronic fillers and breast implants are casuistic for these findings.

In summary, the referenced observations of potential immune responses in the breast after COVID-19 vaccination or acute disease represent a new but rare entity, and the biochemical mechanisms causing these reactions are not understood yet. Further studies are needed to clarify and understand the cause and symptoms of the observed immunopathological reactions. It is advisable for breast surgeons to implement the history of recent vaccinations or a recent COVID-19 infection into the patients' anamnesis. Increased attention and counseling of patients, especially in breast

Level of evidence: Level V, Risk/Prognostic.

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implant carriers, is necessary. At the same time, doctors and patients need to be reassured that the vaccines are proven to be safe. Furthermore, these observed reactions of the breast seem to be extremely rare and are most often manageable with conservative treatments.

Declarations

Ethics approval and consent to participate The Ethics Committee of the Marien Hospital Stuttgart has confirmed that no ethical approval is necessary for the conduction of this research article. The letter to the editor represents an opinion and interpretation of the current literature. No human subjects were directly studied or their data obtained.

Conflict of interest The authors declare no competing interests.

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