



# Potential immune response to breast implants after immunization with COVID-19 vaccines

Laurenz Weitgasser\*, Maximilian Mahrhofer, Thomas Schoeller

Department of Plastic and Reconstructive Surgery, Marienhospital Stuttgart, Teaching Hospital of the Eberhard Karls University Tuebingen, Germany

## ARTICLE INFO

### Article history:

Received 20 May 2021

Accepted 6 June 2021

Available online 18 June 2021

### Keywords:

COVID-19

Breast implant

Breast reconstruction

Breast augmentation

Vaccination

Immune response

## ABSTRACT

Besides reports of alarming potential side effects after COVID-19 vaccinations there have been rare observations of rather benign reactions to foreign materials such as cosmetic hyaluronic acid filler injections after a COVID-19 immunization. Likewise to dermal fillers any foreign material may cause a reaction when the immune system is triggered. In the recent weeks we observed four noteworthy potential reactions in association with breast implants between one and three days after COVID-19 vaccinations. We release these information at the earliest to educate colleagues and draw attention to possible reactions between the COVID-19 vaccines and foreign bodies such as breast implants.

© 2021 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Dear Editor,

COVID-19 vaccination associated complications and side effects have widely gained public attention and media coverage recently. Reports of lethal cavernous sinus thrombosis and pulmonary artery embolism after vaccination with the COVID-19 vaccines represent a major concern for patients and doctors. Besides these alarming potential side effects there have been rare observations of rather benign reactions to foreign materials such as cosmetic hyaluronic acid filler injections after a COVID-19 immunization [1,2]. These Filler reactions presented as soft tissue swelling and facial edema shortly after the first and/or second dose with the Moderna vaccine. Symptoms of an immune response to the foreign material were recorded between one and two days after the vaccination during the Moderna phase three trial and were independent from the time of the cosmetic injectable treatment. Interestingly the time of facial hyaluronic acid treatment was somewhat between two weeks and up to two years before the immunization with a COVID-19 vaccine. Similar reactions were observed after immunizations with influenza vaccines in the past [3]. In theory, likewise to dermal fillers any foreign material may cause a reaction when our immune system is triggered as consequence of the normal elevated immune response.

Therefore any other implant, such as a breast implant or an artificial joint may also be subject to an inflammatory response after different types of vaccinations.

In the recent weeks we observed four noteworthy potential reactions in association with breast implants between one and three days after COVID-19 vaccinations. We believe it is relevant to share these observations and raise awareness of potential and not well understood reactions of the immune system to breast implants after COVID-19 immunizations. We are aware that these potential side effects after the immunizations that we discuss here are subjective observations of very unlikely events. Nevertheless we feel the urge to release these information at the earliest to educate colleagues and draw attention to possible reactions between the COVID-19 vaccines and foreign bodies such as breast implants.

Our first patient had a cosmetic breast augmentation five years earlier and presented with sudden onset of pain and discomfort resembling symptoms of bilateral capsular fibrosis two days after receiving the Pfizer/Biontec vaccine. All symptoms resolved spontaneously two days after onset under local treatment with an oral NSAID and cryotherapy. A second patient had a bilateral breast augmentation with implants 17 months prior and presented with the same symptoms and sudden onset of pain bilaterally just two days after receiving the Pfizer/Biontec vaccine Fig. 1. Again these symptoms resolved spontaneously shortly after they occurred with conservative therapy Fig. 2. Our third patient presented with onset of excruciating pain in her right breast where she had an expander placement in preparation of a later implant based reconstruction

\* Corresponding author. Department of Plastic-, Reconstructive- and Aesthetic Surgery, Marienhospital Stuttgart, Boenheimstr 37, 70199, Stuttgart, Germany.

E-mail address: [Laurenz.weitgasser@vinzenz.de](mailto:Laurenz.weitgasser@vinzenz.de) (L. Weitgasser).



**Fig. 1.** Patient 2 underwent a cosmetic breast augmentation 17 months earlier presenting with sudden pain and redness in the inferior breast pole 2 days after immunization with the Pfizer/Biontec vaccine.



**Fig. 2.** Patient 2 five days after initiating conservative therapy including cryotherapy and oral NSAIDs.

after receiving an immunization with the Johnson and Johnson's Janssen vaccine three days earlier. Her last expander filling was four weeks earlier. On examination there were no signs of any inflammation, capsular fibrosis or other remarkable findings. A seroma was excluded in an ultrasound. Again, conservative therapy including oral tramadol due to high level of pain was started and all symptoms resolved during the next days. Our most recent and fourth patient presented with sudden exaggerating pain and signs of a fulminant infection in her right breast after implant reconstruction eight weeks earlier. The patient was immunized with the AstraZeneca vaccine one day prior to her presentation to our department. After symptoms worsened in the following days under initial treatment with an oral antibiotic an ultrasound revealed seroma which was not present in earlier postoperative scans. Puncture revealed pus in the implant pocket and we therefore removed the implant and performed a thorough washout and an immediate reconstruction with a free transverse myocutaneous

gracilis flap from the contralateral thigh. The further postoperative course was uneventful and the patient was discharged a few days later. Microbiology did not grow any pathogen from the taped implant pocket. Detailed Patient demographics and the type of reaction and treatment are listed in [Table 1](#).

It is safe to assume that after many million immunizations with COVID-19 vaccines worldwide there should not be any major concern towards reactions to implanted materials, which were only observed in a very small population receiving dermal fillers. Still increased attention to any potential reaction in implant carriers is necessary and we believe patients should be counseled to closely observe any notable immune reaction related to their implants after receiving a vaccine. At the same time patients as well as doctors need to be reassured that the treatment of any post-vaccination reaction to any implant is highly manageable and the risks associated with contracting COVID-19 far outweighs those posed by these very rarely observed reactions.

**Table 1**  
Patient (1–4) demographics, history and symptoms.

	Patient 1	Patient 2	Patient 3	Patient 4
<b>Age (years)</b>	76	52	52	55
<b>Operation</b>	Cosmetic Breast Augmentation	Cosmetic Breast Augmentation	Expander placement for later Implant based reconstruction	Implant based breast reconstruction
<b>Diagnosis</b>	Capsular fibrosis	Capsular fibrosis	Mastectomy	Mastectomy
<b>Side</b>	Bilateral	Bilateral	Unilateral	Unilateral
<b>Time since operation (months)</b>	64	17	9	2
<b>Onset of symptoms (after vaccination)</b>	2 days	2 days	3 days	1 day
<b>Vaccine</b>	Biontec 1. Shot	Biontec 1. Shot	Johnson & Johnson (single dose)	AstraZeneca 1. Shot
<b>Symptoms</b>	Pain, Swelling	Pain, Redness	Pain	Pain, Inflammation, Seroma
<b>Treatment</b>	Conservative: oral NSAIDs and cryotherapy	Conservative: oral antibiotic, cryotherapy and NSAIDs	Conservative: oral opioid and metamizole	Surgery: Implant removal and autologous breast reconstruction, parenteral antibiotics

### Declaration of competing interest

None of the authors have a financial interest in any product, device, drug or pharmaceutical company.

### References

[1] Zhang R. FDA presentation and voting questions. U.S. Food and drug

administration, center for biologics evaluation and research, 163rd meeting of the vaccines and related biological products. MD: Advisory Committee. Silver Spring; 2020.

[2] U.S. Food and Drug Administration. Moderna COVID-19 vaccine emergency use authorization [Internet]. <https://www.fda.gov/media/144434/download>. [Accessed 22 December 2020].

[3] Turkmani MG, De Boule K, Philipp-Dormston WG. Delayed hypersensitivity reaction to hyaluronic acid dermal filler following influenza-like illness. Clin Cosmet Invest Dermatol 2019;12:277.