Polyacrylamide hydrogel (PAAG) has been widely used in Russia and China as an injection material for cosmetic surgery. It is often used, mainly in breast enlargement for breast augmentation and facial anti-wrinkle surgery. However, in patients injected with PAAG, many complications have been reported, and in 2006, its use was banned in China, where it was originally manufactured. In 2019, the Japan Society of Plastic and Reconstructive Surgery issued a warning regarding the use of this filler in Japan. We report the case of a 36-year-old woman who noted breast enlargement subsequent to breastfeeding after a PAAG injection. In 2016, a PAAG injection was administered to her under both mammary glands at a nearby cosmetic surgery clinic for breast augmentation. After she started breastfeeding following delivery in 2020, she was admitted to our hospital because of a rapid left breast enlargement and unbearable pain. Contrast-enhanced chest computed tomography revealed marked fluid retention in the left breast, and the mammary gland tissue had been pushed outward. A skin incision revealed a significant amount of yellowish-white odorless fluid accumulation. On surgery, a foreign body remained around the pectoralis major muscle, but complete removal was impossible. Currently, 3 months have passed since the operation; however, the patient has not experienced any further pain. There have been many reports on complications caused by PAAG injection. In our case, commencing breast feeding after receiving PAAG injections resulted in a rapid unilateral breast enlargement, and there is no similar report from Japan. In this case, suppressing lactation and rapid removal of the foreign body is the most important measure. It is difficult to completely remove PAAG once it has been injected. PAAG injections for breast augmentation should be avoided in all patients.

CASE DESCRIPTION

The patient was a 36-year-old woman. In 2016, 200 g of PAAG was injected under the mammary glands in each breast for breast augmentation at a cosmetic surgery clinic. She gave birth in February 2020 and was breastfeeding. Since then, the patient had noticed a rapid enlargement of her left breast (especially around March 2020), and she was administered oral antibiotics for 14 days at a nearby physician’s office. However, the response was poor; she felt unbearable pain and was admitted to our hospital. The patient had no significant medical history, and there was no fever at the time of admission. Although the left breast was very swollen, there was no erythema or warmth on the skin. A blood test showed white blood cell count and C-reactive protein level of 8600/1 (reference value, 3300–8600 per liter) and 0.51 mg/dl (reference value, ≤0.3 mg/dl), respectively, indicating no serious infection. Contrast-enhanced chest computed tomography (CT) revealed marked fluid retention in the left breast, and the mammary gland tissue had been pushed outward. A skin incision revealed a significant amount of yellowish-white odorless fluid accumulation. On surgery, a foreign body remained around the pectoralis major muscle, but complete removal was impossible. Currently, 3 months have passed since the operation; however, the patient has not experienced any further pain. There have been many reports on complications caused by PAAG injection. In our case, commencing breast feeding after receiving PAAG injections resulted in a rapid unilateral breast enlargement, and there is no similar report from Japan. In this case, suppressing lactation and rapid removal of the foreign body is the most important measure. It is difficult to completely remove PAAG once it has been injected. PAAG injections for breast augmentation should be avoided in all patients.

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Received for publication September 7, 2020; accepted October 30, 2020.

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DOI: 10.1097/GOX.0000000000003335

Disclosure: The authors have no financial interest to declare in relation to the content of this article. This study received no funding.
been pushed outward. No axillary lymphadenopathy was observed (Fig. 1). We administered cabergoline 1.0 mg once orally to the patient to suppress lactation. The patient was administered an oral analgesic; however, no effect was observed. Since there was no improvement in pain, the foreign body in the breast was removed under general anesthesia 4 days after the first visit (Fig 2). At the request of the patient, foreign body removal in the right breast without swelling was equally performed simultaneously. First, surgery was performed from the enlarged left breast, and a skin incision was made through the infra-mammary fold. The reason is that the distance to the foreign body was short, and the scars were not noticeable.

Following the incision, a significant amount of yellowish-white, odorless fluid was noted. Similarly, a yellow mud-like foreign body was observed in the fluid and was removed as much as possible (Fig 3). Subsequently, the foreign body was removed from the right breast without any abnormality. The foreign body in the right breast had a cloudy, jelly-like appearance, similar to the original properties of PAAG. No fluid retention was observed around the foreign body in the right breast. Further, the foreign body was extensively fixed around the mammary gland tissue and pectoralis major muscle and could not be completely removed. Both wounds were thoroughly washed with normal saline and closed. From the bacterial culture and smear test, no bacteria were detected in the yellowish-white fluid. Unfortunately, the composition of the liquid could not be analyzed. Histopathological examination revealed chronic inflammation, including neutrophils, and a substance that seemed to be an artificial object was noted; a strong reaction of histiocytes was equally observed. However, no malignant findings were observed. It could not be confirmed that the foreign matter was PAAG, and the pain was alleviated rapidly after the foreign body was removed. No infection or serum accumulation was observed in the postoperative wound. A simple chest CT performed after surgery revealed a
DISCUSSION

PAAG is a transparent jelly-like substance comprising 2.5%–5% hydrophilic polyacrylamide and water. When PAAG is used for breast augmentation, complications including subcutaneous induration, foreign body granuloma, infection, and breast deformity are observed. In addition, there are reports that the early detection of breast cancer can be delayed due to calcification in patients injected with PAAG. It has been reported that the incidence of these PAAG complications is 1.44%–18.21%, and they are by no means rare.

In our case, commencing breastfeeding after receiving PAAG injections resulted in rapid unilateral breast enlargement. Although there have been some similar cases of rapid breast enlargement after breastfeeding to date, as we reported, there are no reports from Japan as far as our research is concerned. Similarly, although the causes of breastfeeding and breast enlargement are unknown, Acartürk et al stated that the cause is a ductal inflammatory fibrosis-stenosis. When breastfeeding starts with a narrowed duct, breast milk excretion is impaired and accumulates in the breast, resulting in a huge galactocele. In our case, the skin incision revealed a significant amount of yellowish-white fluid. These fluids were considered to be breast milk accumulated in the breast due to ductal stenosis, and can thus explain the cause of the rapid breast enlargement. Among the cases reported so far, wherein breast deformity was noted as a result of breastfeeding, none were accompanied by infective symptoms, such as fever, and no bacteria were detected by any bacterial culture and smear test. Most cases of foreign body injection-induced breast enlargement are due to abscess formation associated with infection. However, in cases such as this, where an enlargement was observed upon breastfeeding, the administration of antibacterial agents against infection is not a very effective treatment method. Suppressing lactation and rapid removal of the foreign body is the most important measure.

In this case, we removed the intramammary PAAG; however, it was impossible to completely remove the foreign body that had adhered to the pectoralis major muscle and the mammary gland tissue. The foreign body remained, as observed on chest CT images taken after surgery. It is difficult to completely remove PAAG once it is injected into the body, and it should not be used without consideration. Therefore, healthcare professionals should avoid PAAG injections for breast augmentation in the future.

CONCLUSIONS

We encountered a case of rapid breast enlargement triggered by lactation after PAAG injection. There have been no similar reports from Japan. PAAG injection has been widely used in breast augmentation and cosmetic surgery because of its simplicity. However, it has many complications, such as subcutaneous induration and infection. PAAG injections for breast augmentation should be avoided in all patients.

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