Case Report

Abdominal displacement of breast filler after previous trans-umbilical breast augmentation (TUBA): a case report

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Background: Breast augmentation is one of the most commonly performed aesthetic procedures in the world. Aquafilling filler, since its introduction in 2005 has been used for breast or buttock augmentation in several countries. Aquafilling filler is composed of 2% polyacrylamide with 98% sodium chloride 0.9% solution, and is known to have a similar composition with polyacrylamide hydrogel (PAAG) filler, which is also related to a variety of complications. Although many studies have warned against the complications of aquafilling filler, it is still being used for aesthetic purposes.

Case Description: In this case report, we share our experience of a 36-year-old female patient complaining of smaller left breast and bulging mass in her left upper abdomen. She had a history of transumbilical breast augmentation (TUBA) 11 years prior, which she had had removed via the transumbilical incision 6 years ago. To compensate for the removal of implants, the patient had received large volumes of aquafilling filler injection 2 years after implant removal. Surprisingly, we found out that the filler in the left breast had displaced to the abdominal area.

Conclusions: Accidently displacement may occur, especially in patients who have had previous procedures breaching the inframammary fold including TUBA. Therefore, it is required to observe carefully for those patients who have received breast augmentation or the breast filler injections.

Keywords: Breast implants; injections; aquafilling filler; case report

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Introduction

Augmentation mammoplasty is one of the most popular aesthetic operations worldwide. Although breast augmentation using silicone implants is one of the most common methods, it requires general anesthesia and possible repetitive surgery if results are unsatisfactory (1). Furthermore, complications including scarring, capsular contracture or rippling can be burdensome on patients. Therefore, recently, emphasis on minimally invasive procedures such as using fillers have been used for augmentation procedures.

Historically, various materials have been used for breast

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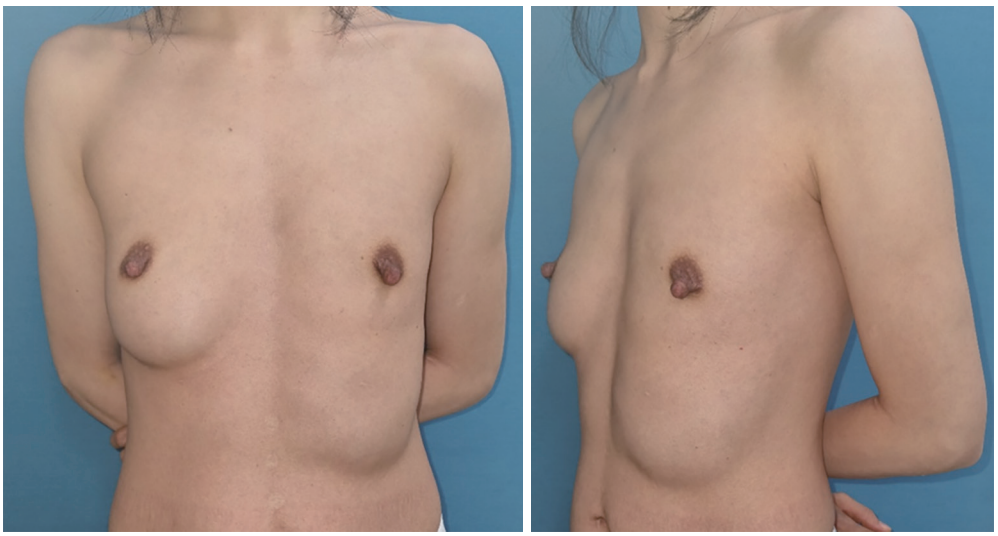

Figure 1 The patient at presentation showing asymmetry breast size and bulging mass in her abdomen area.

augmentation including paraffin, liquid silicone, and polyacrylamide gel (PAAG). In Korea, aquafilling filler is one of the fillers widely used for breast augmentation. Aquafilling filler is a hydrophilic gel composed of 98% sodium chloride solution (0.9%) and 2% cation copolyamide, and it is described as a sterile synthetic material biocompatible with human tissues, offering stable results for approximately 8–10 years (2,3). This product was first used for dermal filler for face and buttocks and its usage has extended for breast and buttock augmentation.

As the usage of aquafilling filler has grown exponentially in local clinics, the number of associated complications has also increased. Reported complications include induration, mass, pain, firmness, and asymmetry. Displacement of the filler material, while uncommon, has been reported as well (4).

Herein, we describe a rare case of abdominal displacement of aquafilling filler of a patient who previously received transumbilical approach breast augmentation. We present this article in accordance with the CARE reporting checklist (available at https://gs.amegroups.com/article/view/10.21037/gs-23-9/rc).

Highlight box

Key findings

- Distant displacement of injected filler for breast augmentation may occur in rare cases.

What is known and what is new?

- This case describes a patient who suffered rare complication after aquafilling filler injection for breast augmentation. Local displacement is common, but displace to a distant location is relatively rare. Distant displacement may occur, especially in patients who have had previous procedures breaching the inframammary fold including transumbilical breast augmentation (TUBA).

What is the implication, and what should change now?

- Patients who have previously received TUBA are prone to displacement of any type of filler, so therefore close observation are required for those patients who have received breast implant augmentation or the additional breast filler injections.

Case presentation

A 36-year-old female patient was referred to Uijeongbu St. Mary's Hospital with a chief complaint of a smaller left breast, bulge in the left upper abdomen and bulging in the lower pole of her right breast (*Figure 1*). She had a history of transumbilical insertion of breast saline implants 11 years prior, which she had removed via the transumbilical incision 6 years ago. Then, to compensate for the removal of implants, she had received large volumes of aquafilling filler injection for 2 years after breast implant removal. The abdominal bulge had developed during the past few weeks, without any symptoms as pain, tenderness and infection signs.

Computed tomography revealed homogenous fluid collection without cystic cavities in the left upper abdomen just inferior to the breast, and fluid of the same density in the lower pole of the right breast (*Figure 2*). History and imaging all indicated displacement of the aquaflling

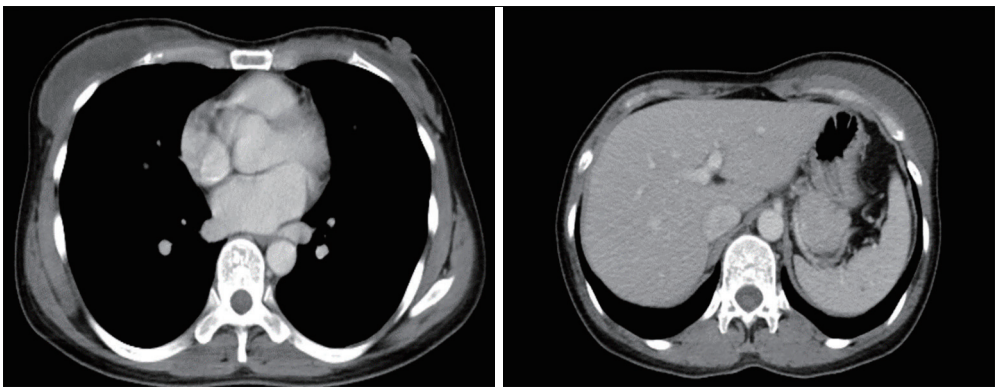

Figure 2 Computed topography sections at the left breast level and abdominal level.

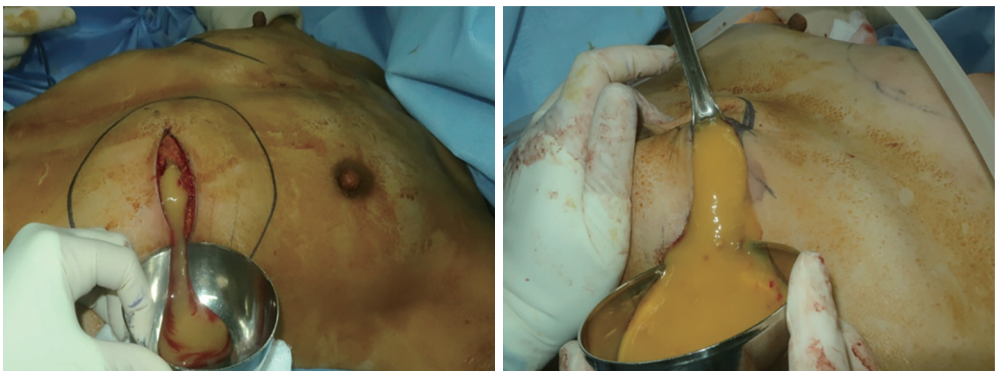

Figure 3 Intraoperative drainage of the left breast via inframammary incision and abdomen.

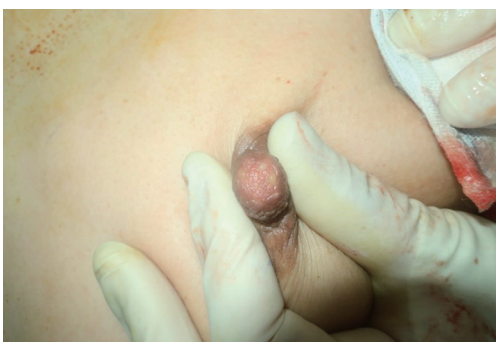

Figure 4 Excretion of identical fluid from the left nipple noticed during drainage of the right breast.

filler material. Under general anesthesia, this material was accessed through a left inframammary incision and a horizontal incision on the abdomen. Pockets of liquefied, yellow cream-like material were found in both incisional sites (*Figure 3*). The yellowish liquid material was collected in the subglandular layer of the right breast and the suprafascial layer of the abdomen. There was a slightly nodular region of the capsule in both breasts, which we excised and sent to the pathology department. The rest of the capsule was thin and not fibrotic characteristics. The material was seen passing through the nipple ducts even with the slightest manipulation, and indicates the possibility of filler material passage via breastmilk in breast-feeding patients (*Figure 4*). The pockets were lined with filmy necrotic tissue which were excised. We performed massive saline irrigation and confirmed the healthy base tissue grossly, drains were placed and layer by layer closure was done. Histologic studies of the nodules excised from the breast showed foreign body material and giant cell reaction with inflammatory infiltrates and extensive fibrosis (*Figure 5*). Tissue culture did not bore any microorganisms. The patient is being followed up for 3 months without any complication (*Figure 6*).

The timeline of the patient's clinical course is as follows (*Figure 7*). All procedures performed in this study were in accordance with the ethical standards of the institutional

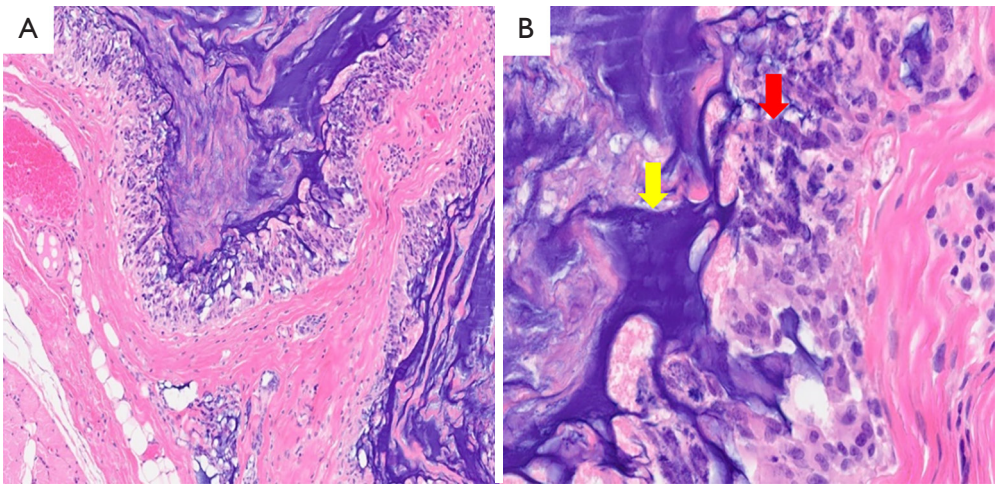

Figure 5 Histological findings (A, ×10) with a higher magnification (B, ×40) showed foreign body reaction with extensive fibrosis (yellow arrow) and multiple giant cells were observed (red arrow) (hematoxylin-eosin stain).

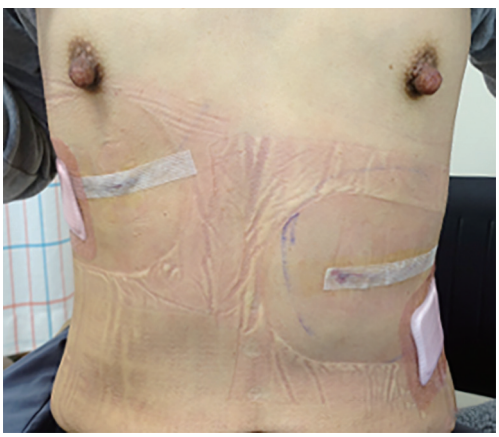

Figure 6 Three months postoperative image.

and/or national research committee and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

Discussion

There are various methods for breast augmentation. Although the breast augmentation using a saline or silicone implant is the most preferred procedure, plastic surgeons have tried to find a less invasive and simpler method for breast augmentation including using fillers and autologous fat graft. The fat graft has an advantage owing to its autologous characteristic, however it lacks longevity and has various complications including fat necrosis and seroma (5). Another simple method for breast augmentation is the filler injection and various types of filler materials have been developed. The most widely used filler materials include hyaluronic acid, polyacrylamide hydrogel (PAAG), collagen and liquid paraffin. However, many of them were initially accepted but later found to cause severe complications (6).

An aquafilling filler is one of the most widely used filler materials used in Europe, Japan and Korea. It is a hydrophilic gel composed of saline (98%) and polyamide (2%) and has been used for the breast and buttock augmentation. Although the use of this gel is not Food and Drug Administration (FDA) approved in USA and is still prohibited in some countries, aquafilling filler is still widely used in many aesthetic plastic surgery clinics in Korea since mid-2010s (7,8).

First introduced in 1993, transumbilical breast augmentation (TUBA) has been performed by many plastic surgeons for the breast augmentation (9). In most breast augmentation cases, the incisions have been through the inframammary crease, axilla, and periareolar site. Sometimes, these incision sites leave visible scars. According to some plastic surgeons, advantages of TUBA operations include invisible scars, shorter procedure time, less postoperative pain and quick recovery time compared to other procedures (10,11). However, TUBA has not been widely performed due to poor access to the implant pocket, the inability to use shaped or gel-filled implants, and the

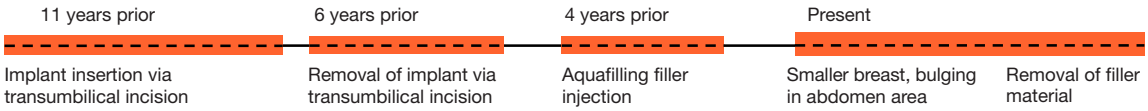

Figure 7 Timeline of the clinical course.

possible needs for a second incision for revisions.

During the TUBA procedure, a short curvilinear incision is made in the superior umbilical recess and long dissector is advanced up the abdomen toward the axilla and the dissection is maintained in the deep subcutaneous layer. Depending on the surgeon's grasping, breast pocket is refined using the serrated dissector. Then the permanent implant is introduced via the umbilical incision and gently advanced through the subcutaneous tunnel into position in the subpectoral pocket (11). Breaching of inframammary fold is inevitable during this procedure. Therefore, there is a possibility of displacement of foreign materials including fillers through this pathway.

As aquafilling filler is liquid and hydrophilic, it can absorb body fluid and exudates, forming good media for bacterial growth (12). In addition, it might also flow to a distant place under the influence of gravity, resulting in infection of surrounding tissues. Once infection occurs, it can lead to irreversible complications and moreover, complete removal of filler is almost regarded impossible (13).

Aquafilling fillers are still widely used for breast and buttock augmentation surgery in local aesthetic clinics in Korea. Therefore, many patients who were injected with aquafilling fillers encounter complications recently, and some of them include severe complications in which need to remove the filler. Compared with the facial augmentation, breast augmentation requires a large amount of fillers; hence, displacement of injected fillers might lead to unexpected severe complications. There have been many reports on the unfortunate consequences found in patients that had received injection of the aquafiller filler, notably a study on 146 cases (14). Complications included infection, palpable lesions, firmness, displacement, and even one case of sepsis have been reported. There are several reports of injection of PAAG may cause irreversible damage to the breasts in healthy women and poor prognosis even though serial debridement of necrotic tissue (15,16). Since the high risk of breast cancer associated with PAAG filler, close follow-up is needed for patients who have already received injections of PAAG filler (17,18). Moreover, the diagnosis of breast cancer can be delayed and prognosis can be affected by injected these type of filling gels. Even though use of this filler material in breast augmentation is advised against, there are probably many more patients with complications that will be visiting plastic surgeons. Therefore, plastic surgeons should be aware of the possible long term complications regarding breast augmentation prosthesis.

Another point to remember is that while TUBA is virtually scarless, the previous dissection between the umbilicus and breasts have potential tunnels, and causes disruption of the inframammary fold. Combined with any type of filler known to displace, the patient will be prone to displacement of this filler material toward the abdomen.

Conclusions

This case describes a patient who suffered rare complication after aquafilling filler injection for breast augmentation. Local displacement is common, but displacement to a distant location is relatively rare. Distant displacement may occur, especially in patients who have had previous procedures breaching the inframammary fold including TUBA. Once distant displacement of injected fillers have already occurred, revisional management is challenging. Moreover, patients who have previously received TUBA are prone to displacement of any type of filler, so therefore close observation are required for those patients who have received breast implant augmentation or the additional breast filler injections.

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Footnote

Reporting Checklist: The authors have completed the CARE reporting checklist. Available at https://gs.amegroups.com/article/view/10.21037/gs-23-9/rc

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Conflicts of Interest: All authors have completed the ICMJE

uniform disclosure form (available at https://gs.amegroups.com/article/view/10.21037/gs-23-9/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

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