Failure of an Ancient Breast Implant Can Lead to Significant Morbidity

Ali K. Mohammed 1, Sherif Monib 2

1. Surgery, Watford General Hospital, Watford, GBR. 2. Breast Surgery, St. Albans and Watford General Hospitals, West Hertfordshire Hospitals NHS Trust, London, GBR

Corresponding author: Sherif Monib, sherif.monib@nhs.net

Abstract
Implant-based breast reconstruction is the most popular reconstruction option following mastectomy. However, it is not without complications, some of which can be trivial while others can lead to significant morbidity, especially in geriatric patients. Severe capsular contracture, implant failure, infection, or suspected breast implant-associated anaplastic large cell lymphoma are examples of complications that will eventually require explantation in most cases.

As patients with implant-based reconstruction age, the risk of complications increases, which should be considered by treating physicians. We describe the case of a 90-year-old patient who presented to our emergency department after a fall with worsening confusion, which was attributed to a 60-year-old left breast implant rupture and a peri-implant infected hematoma confirmed with CT and ultrasound.

Introduction
Breast cancer represents around 15% of all cancer cases in males and females combined; it is also considered the most common female cancer [1]. The lifetime incidence of female breast cancer is 12.3%; around 48% of cancers are seen in patients over 65 years, and around 30% of those cases are found in the population over 70 years [2].

While the first written evidence of breast cancer dates back to ancient Egypt in 3000 to 2500 BC in the Edwin Smith Papyrus [3], Aëtius of Amida to Theodora carried out the first mastectomy for breast cancer treatment in 548 AD [4]. With recent advances in medical science and appreciation of the importance of considering patients’ psychological and physical needs alongside oncological management, different breast reconstruction options have evolved to satisfy patients and achieve acceptable oncological outcomes. Different types of breast implants and tissue expanders have allowed breast reconstruction to be tailored to patients’ needs to achieve symmetry with the contralateral breast.

Case Presentation
We present the case of a 90-year-old independent female who presented to our accident and emergency department with a recent fall and worsening confusion. Her past medical history included mild dementia, recent recurrent falls, atrial fibrillation, deep venous thrombosis, hypertension, hysterectomy, and breast cancer treated with mastectomy and implant-based reconstruction in 1965. Her current medications included oral anticoagulants and antihypertensive medications, and her family history was irrelevant.

A general examination revealed that she was frail, was mildly confused, and had a blood pressure of 130/85, pulse of 92 BPM, and temperature of 38°C. Breast examination of the right side revealed no palpable lumps or axillary or supraclavicular lymph nodes; examination of the reconstructed left breast showed grade IV capsular contracture as per the Baker scale (grade I, the breast is normally soft and appears natural in size and shape; grade II, the breast is a little firm but appears normal; grade III, the breast is firm and appears abnormal; and grade IV, the breast is hard, is painful to the touch, and appears abnormal) [5], with pale skin and no signs of local or nodal recurrence (Figure 1).
FIGURE 1: Clinical picture showing left-sided implant-based reconstruction with swollen breast, tensed skin, and bruised upper half due to collection.

Blood tests revealed a hemoglobin level of 104 g/L, a white cell count of $10.1 \times 10^9$/L, C-reactive protein of 87 mg/L, and albumin of 30 g/L, with normal other liver and kidney functions, whereas SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) polymerase chain reaction (PCR) test was positive. CT of the chest, abdomen, and pelvis carried out to rule out any other causes of sepsis and investigate the causes of chronic ischemic pain of the right foot showed a failed left breast implant, peri-implant hematoma, and no other septic foci (Figure 2).
A left breast ultrasound scan showed a generalized heterogeneous snowstorm appearance, denoting free silicone due to extracapsular rupture with a peri-implant hematoma; no discrete mass was identified, and the axilla was clear (Figure 3).
The patient was treated with antibiotics and supportive treatment, and an explanation was planned to take place after the patient recovered from this acute episode.

Discussion

Breast cancer surgical treatment has continuously evolved, especially for breast reconstruction following mastectomy. The first attempt at breast reconstruction was in 1895 using flank lipoma transplanted into the mastectomy cavity [6]. Subsequently, in 1905, the pectoral muscle was used as a mound [7], and in 1906 a pedicled latissimus dorsi myocutaneous flap was used to reconstruct the breast after difficulty closing the wound [8]. The first silicone gel breast implant was introduced in 1963 by Cronin and Gerow [9]. In 1982, Radovan introduced tissue expanders [10], and in 1984 Becker described a dual-chamber expander with a silicone gel outer lumen with an inflatable inner saline lumen, which led to the possibility of having a single-stage breast reconstruction [11].

The incidence and risk factors for implant-related complications vary, yet it is known that the risk of implant rupture increases with implant age; around 15% of implants are expected to fail between the third and the tenth year [12]. Implant-related infection is seen in 2% of patients; two-thirds of infections develop within the early postoperative period, whereas one-third of infections may develop years or even decades after surgery [13]. Infection rates are generally higher after breast reconstruction, especially delayed reconstruction, than after breast augmentation. The risk factors for implant infection include poor surgical techniques and patients’ underlying conditions. Early infections are mainly attributed to intraoperative contamination, whereas late infection usually results from secondary bacteremia or invasive procedures at locations other than the breast [13].

Most breast implant infections are associated with biofilms leading to increased resistance to the immune system and antibiotics, resulting in chronic infection and treatment failure [14]. The current hypothesis of the possible role of low-grade or subclinical infection in the capsular contracture origin is also considered [13].

While Krajcová et al. reported implant rupture after 10 years due to sports-related trauma [15], we believe that implant failure after 60 years in our case was related to the patient’s recent fall, as the pre-fall imaging studies showed an intact implant, and the peri-implant hematoma was observed following the fall.

Breast implant failure complicated by infection can lead to significant morbidity, which, in most cases, requires urgent explantation [16]; in our case, explantation was planned as soon as the patient recovers from the acute condition. Clinicians need to stay vigilant and look out for clinical signs of implant-related complications, especially in elderly patients with breast implants.

Conclusions

We believe that we present one of the oldest implant-based reconstruction cases in the literature, which lasted for a very long time before causing serious complications mandating hospitalization, medical treatment, and planned surgical intervention.

Our case highlights the importance of history-taking and full-body examination in geriatric patients presenting with confusion after a recent fall. It also elaborates that minor trauma to reconstructed breasts can be complicated by implant rupture and peri-implant hematoma, leading to unfavorable patient outcomes.

Additional Information

Disclosures

Human subjects: Consent was obtained or waived by all participants in this study. Conflicts of interest: In compliance with the ICMJE uniform disclosure form, all authors declare the following: Payment/services info: All authors have declared that no financial support was received from any organization for the submitted work. Financial relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. Other relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

References

1. Cancer incidence for common cancers. (2021). Accessed: February 2, 2021: https://www.cancerresearchuk.org/health-professional/cancer-statistics/incidence/common-cancers-compared.
2. Duggan MA, Anderson WF, Altekruse S, Penderhy L, Sherman ME: The surveillance, epidemiology, and end results (SEER) program and pathology: toward strengthening the critical relationship. Am J SurgPathol.
3. Bland KI, Beenken S, Copeland EM: Schwartz’s Principles of Surgery. McGraw-Hill Education, New York, NY; 2005.
4. Mandell JB: Bathsheba’s breast women, cancer & history. J Clin Invest. 2005, 115:1397-1397. 10.1172/JCI25456
5. Spear SL, Baker JL Jr: Classification of capsular contracture after prosthetic breast reconstruction. Plast Reconstr Surg. 1995, 96:1119-1123.
6. Czerny V: Plastic replacement of the breast with a lipoma. Chir Kong Verhandl. 1895, 2:216.
7. Teimourian B, Adham MN: Louis Ombredanne and the origin of muscle flap use for immediate breast mound reconstruction. Plast Reconstr Surg. 1983, 72:905-910. 10.1097/00006534-198312000-00037
8. Tanzini I: Spora il mio nuovo processo di amputazione della mammella. Riforma Medica. 1906, 22:757.
9. Cronin TD, Gerow FJ: Augmentation mammoplasty: a new “natural feel” prosthesis. Transactions of the Third International Congress of Plastic and Reconstructive Surgery. Excerpta Medica, Amsterdam; 1963.
10. Radovan C: Breast reconstruction after mastectomy using the temporary expander. Plast Reconstr Surg. 1982, 69:195-206. 10.1097/00006534-198202000-00001
11. Becker H: Breast reconstruction using an inflatable breast implant with detachable reservoir. Plast Reconstr Surg. 1984, 73:678-683. 10.1097/00006534-198404000-00031
12. Hölmich LR, Friis S, Fryzek JP, et al.: Incidence of silicone breast implant rupture. Arch Surg. 2003, 138:801-806. 10.1001/archsurg.138.7.801
13. Pittet B, Montandon D, Pittet D: Infection in breast implants. Lancet Infect Dis. 2005, 5:94-106. 10.1016/S1473-3099(05)01281-8
14. Constantine RS, Constantine RC, Rohrich RJ: The ever-changing role of biofilms in plastic surgery. Plast Reconstr Surg. 2014, 133:865-872. 10.1097/PRS.000000000000213
15. Kračírová A, Hurt K, Kuba R, Molitor M: Breast implant rupture: a sports trauma report. Ceska Gynekol. 2020, 85:116-119.
16. Walker JN, Poppler LH, Pinkner CL, Hultgren SJ, Myckatyn TM: Establishment and characterization of bacterial infection of breast implants in a murine model. Aesthet Surg J. 2020, 14:516-528. 10.1093/asj/sjz190