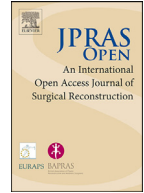




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Case Report

Simultaneous breast implant infection and acute myocardial infarction–A tricky combination

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ABSTRACT

We present the case of a 57-year-old woman with a history of breast implants after augmentation mastopexy and persistent breast pain for six months. Despite a previous implant exchange with capsulectomy, the patient experienced a recurrence of symptoms for the last six months with a sudden worsening during the last night. Clinical examination revealed an asymmetry in favour of the left breast, but otherwise no clear evidence of implant-associated complication. The reported pain started retrosternally and radiated to the left scapula and arm. An acute myocardial infarction was suspected. Subsequent investigations confirmed a ST-elevation myocardial infarction. The patient received immediate cardiac catheterization, addressing an acute occlusion of the left anterior descending artery, followed by dual antiplatelet therapy.

Despite successful treatment of the myocardial infarction, the patient continued to report pain in her left breast. In addition, inflammatory markers were significantly elevated. After excluding other possible sources of infection, sonography confirmed the suspicion of an implant infection. A multidisciplinary team approach guided therapeutic decision-making, balancing the high cardiovascular risk with the need to manage the implant-associated infection.

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tion. Empirical antibiotic therapy and implant removal under sedoanalgesia facilitated resolution of symptoms and infection. This case highlights the importance of maintaining a broad differential diagnosis in patients presenting with breast implant-related concerns, particularly in those with concomitant cardiovascular risk factors.

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Introduction

The incidence of complications associated with breast implants is on the rise, as the number of breast augmentation procedures increases. These complications present a challenge to plastic surgeons and often necessitate careful consideration in treatment.¹

Infection after breast implants is a severe complication that can manifest in the acute postoperative period (days to weeks after surgery), the subacute onset (within a few months), or as a late-onset complication (after more than six months).² The reported incidence rate of breast implant infection ranges from 1.1 % to 2.5 %.³ Acute infections are more likely to present with fever, breast pain, erythema and drainage. Subacute infections tend to present with chronic pain, persistent drainage or implant rotation² and increase the risk of capsular contracture. Currently, there is no established guideline for the optimal treatment of severe infections. One or two-stage procedures, as well as non-operative management, are potential treatment options.⁴

In comparison to the symptoms of infection previously outlined, acute chest pain radiating to the arm, shoulder and abdomen, in addition to discomfort and nausea, are typically described in myocardial infarction.⁵

Case report

A female patient inquired by phone about the possibility of an appointment at the Plastic Surgery Outpatient Clinic, for breast pain that had persisted for six months. Within the next hour, the extremely distressed 57-year-old patient presented to our Plastic Surgery Outpatient Clinic.

The patient had breast implants after an augmentation mastopexy twelve years ago. Three years prior, she underwent an implant exchange with capsulectomy due to severe bilateral capsular fibrosis with subacute infection. Six months ago, the symptoms reappeared and became progressively worse. Clinical examination revealed a slight asymmetry in favour of the left breast, but otherwise no clear abnormalities such as inflammatory erythema, local hyperthermia or induration.

During the night before admission, the patient experienced a sudden worsening of the pressing pain. The pain started retrosternally and radiated to the left scapula and arm. The patient presented with several cardiovascular risk factors, including chronic nicotine abuse, arterial hypertension, and diabetes mellitus. Because of the pathognomonic pain pattern and the deteriorated general condition an acute myocardial infarction (AMI) was suspected. Colleagues from the department of internal medicine took over the further investigation.

The electrocardiogram revealed ST elevations in the anterior leads. The levels of high-sensitive Troponin I (hsTNI) (38,281 pg/ml) and creatine kinase (CK) (1932 U/l) were found to be significantly elevated, leading to the diagnosis of acute ST-elevation myocardial infarction (STEMI). Additionally, there was an increase in leukocytes to 16.5 GIGA/l without an apparent focus.

The patient received guideline-compliant therapy and was transferred to the nearest tertiary care center for cardiac catheterization. Angiography revealed an acute occlusion of the medial left anterior descending artery (LAD), which was recanalized and treated with a drug eluting stent (DES). Dual antiplatelet therapy was established.



Figure 1. Preoperative asymmetry in favour of the left breast.

The patient was readmitted to our hospital for further inpatient care after two days, without cardiac complications and with improved general condition. Because of suspected mastitis, empirical antibiotic therapy with cefuroxime was started the day before. However, she still reported superficial pain in her left breast. Inflammatory parameters were elevated (leukocytes 15.2 GIGA/l and C-reactive protein (CRP) 20.12 mg/dl) on readmission.

The clinical examination demonstrated a persistent asymmetry in favour of the left breast (Figure 1), accompanied by hyperthermia. A breast ultrasound showed anechoic fluid around the implant with some fibrinous deposits and a slightly thickened capsule. The findings were consistent with infection.

Blood cultures, urinalysis and chest x-ray were performed to rule out other sources of infection.

Following two days of antibiotic therapy, despite a reduction in inflammatory parameters and cardiac enzymes (leukocytes 12.0 GIGA/l and CRP 13.98 mg/dl, hsTNI 26,454 pg/ml and CK 190 U/l), there was no significant improvement in symptoms and the general condition remained deteriorated. Sonographic follow-up of the left breast was performed and 175 ml of cloudy fluid was aspirated, which was sent for microbiological examination.

In an interdisciplinary case conference with cardiologists, anaesthetists and plastic surgeons, the treatment options for the implant infection under dual antiplatelet therapy were discussed.

According to European guidelines, it is imperative to sustain dual antiplatelet therapy for a minimum of three months after STEMI and DES⁶ and general anaesthesia is associated with a significantly higher risk in the first three to six months after AML.⁷ However, in the case of a symptomatic implant infection, permanent antibiotic treatment for at least three to six months did not appear to be medically advisable because of increased risk of local progression, systemic spread and the development of bacterial resistance. In conclusion, early implant removal under sedoanalgesia was decided.

Six days after the cardiac event, the surgery was performed under sedation and local anaesthesia. The right implant was removed without complications. On the left side, a large amount of periprosthetic fluid was drained and a sample taken for bacteriological analysis. The implant was noticeably yellowish in colour compared to the right side (Figure 2). Inside the capsule remaining within the breast there was an abundance of sloughy deposits (Figure 3). A sample was taken for histology. A total capsulectomy was not performed due to the increased risk of bleeding. Given the elevated risk profile, the patient was transferred to the intensive care unit for two nights for postoperative observation. The patient reported an immediate improvement in symptoms and a reduction in inflammatory markers (leukocytes 9.6 GIGA/l and CRP 1.80 mg/dl) was observed. Cytology showed a large number

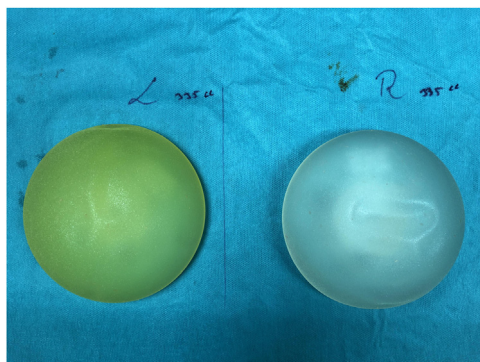


Figure 2. Implants after removal, the left implant with a yellowish hue.

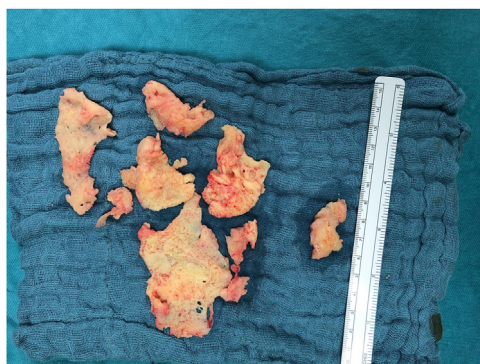


Figure 3. Sloughy deposits inside the left capsule.

of leukocytes in the aspirate, a clear indication of an inflammatory reaction. Interestingly, no bacteria were found, probably due to the already established cefuroxime therapy.

After a total of ten days, the patient was discharged to outpatient follow-up in good general condition. At two and six weeks postoperatively, the patient was symptom-free and satisfied with the aesthetic result (Figure 4).

Discussion

The difficulty is to differentiate between symptoms of myocardial infarction and implant infection and subsequently to make the right decision for further management, taking into account the cardiovascular risk situation.

The primary complaints in the left breast described for six months could have been symptoms of a late-onset infection and capsular fibrosis.² Histology confirmed capsular fibrosis. CD30 cells, indicative of anaplastic large-cell lymphoma (ALCL), were not detected. However, there must have been an acute infection, given the elevated infection laboratory and the leukocytes found in the cytology.

Although AMI is associated with elevated CRP levels, values of 20 mg/dl or above are uncommon.⁸ An immune response of the body to myocardial infarction could have caused an acute activation of a chronic inflammation with accompanying capsular fibrosis resulting in acute infection, necessitating rapid action. Reduction in leukocyte and CRP values, in addition to the alleviation of symptoms, was observed shortly after implant removal, which supports the diagnosis of acute implant infection.



Figure 4. Six weeks after implant removal.

As previously noted, there is no unanimous consensus regarding the optimal management of implant infection.⁴ However, in the case of a symptomatic implant infection, early implant removal appeared to be the best choice.

Local anaesthesia, supplemented by sedation was identified as the preferred method for risk reduction. Our case shows that a multidisciplinary approach ensured a high-quality outcome and early discharge.

Conclusion

This case report illustrates how challenging a medical telephone consultation can be and underlines the importance of offering personal consultations.

It is essential to maintain a broad differential diagnosis in patients presenting with uncommon breast implant-related symptoms, particularly in patients with concomitant cardiovascular risk factors. By elucidating the diagnostic and therapeutic challenges encountered in this case, we aim to contribute to the growing body of literature guiding the management of similar clinical scenarios.

Ethical approval

Not required.

Declaration of competing interest

The authors declare there is no conflict of interests.

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References

1. Hefel K, Mahrhofer M, Russe E, Moncher J, Wechselberger G, Schwaiger K. Breast implant removal and simultaneous aesthetic optimization : possibilities, technical considerations and outcome analysis. *Chirurgie*. 2024;95(1):63–70.
2. Lalani T. Breast implant infections: an update. *Infect Dis Clin North Am*. 2018;32(4):877–884.

3. Washer LL, Gutowski K. Breast implant infections. *Infect Dis Clin North Am.* 2012;26(1):111–125.
4. Vasilakis V, Yamin F, Reish RG. Surgeons' dilemma: treatment of implant-associated infection in the cosmetic breast augmentation patient. *Aesthetic Plast Surg.* 2019;43(4):905–909.
5. Alpert JS, Thygesen K, Antman E, Bassand JP. Myocardial infarction redefined—a consensus document of The Joint European Society of Cardiology/American College of Cardiology Committee for the redefinition of myocardial infarction. *J Am Coll Cardiol.* 2000;36(3):959–969.
6. Byrne RA, Rossello X, Coughlan JJ, Barbato E, Berry C, Chieffo A, et al. 2023 ESC Guidelines for the management of acute coronary syndromes: developed by the task force on the management of acute coronary syndromes of the European Society of Cardiology (ESC). *Eur Heart J.* 2023;44(38):3720–3826.
7. Maillé JG, Boulanger M, Dyrda I, Tremblay N. Anesthesia and myocardial infarction. *Can Anaesth Soc J.* 1986;33(6):807–819.
8. Yip HK, Wu CJ, Chang HW, Yang CH, Yeh KH, Chua S, et al. Levels and values of serum high-sensitivity C-reactive protein within 6h after the onset of acute myocardial infarction. *Chest.* 2004;126(5):1417–1422.