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CASE REPORT / ПРИКАЗ БОЛЕСНИКА

Breast implant rupture 37 years after breast augmentation

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SUMMARY

Introduction Silicone implants have been used ever since the second half of the 20th century. Over that period, several generations of implants have been developed that differed in thickness of the shell and viscosity of the silicone gel. Development of these generations of implants was accompanied with different complication rates. The first-generation implants had the lowest tendency to rupture, but were more prone to capsular contracture and calcification formation.

Case outline An 81-year-old female patient had her silicone implants placed in 1983. After a chest injury in 2015, on the lateral aspect of the left breast a tumefaction becomes palpable and she complains of pain. She denied any subjective problems before the injury. After pertinent diagnostic procedures and clinical examination, silicone implant rupture was suspected. Surgical findings confirmed ruptures of both implants so that they were extracted, capsulectomy was performed and the surrounding tissue imbibed with silicone removed. Samples were sent for histopathological examination.

Conclusion Implant rupture is one of late complications of breast augmentation. The incidence of ruptures has changed with development of newer generations of silicone implants. We believe that our patient had the first-generation silicone implants, knowing the time of their placement to the occurrence of symptoms and macroscopic appearance of the shell after extraction. The fact is that these implants have proved to be very durable, but regardless of the lack of symptoms, current guidelines recommend regular screening for rupture, while possible preventive extraction, particularly in case of so old implants should be considered.

Keywords: implant rupture; silicone implants; breast augmentation

INTRODUCTION

Augmentation mammoplasty is a surgical procedure where the use of silicone implants or transfer of fatty tissue result in breast enlargement, regaining of the volume or achieving the desired shape [1]. Augmentation mammoplasty is one of the most commonly performed procedures in esthetic surgery worldwide. Since 2006 it has been the most commonly performed esthetic operation in the US. In 2019 only in the US 2.3 million esthetic operations were performed, excluding minimally invasive procedures. Out of these, 193,073 were augmentation mammoplasties, accounting for 8% of the total number [2].

Silicone implants have been used for over half a century. Generations of implants have been developed that differed in thickness of the shell and composition of the filling [3]. Complications after breast enlargement can be classified into early and late. Early complications include infection, asymmetry, hematoma, seroma, pain, altered sensations. Late complications include change of implant position, implant rupture, contracture and other [4, 5]. Implant rupture most commonly results from the implant age, trauma or can occur due to iatrogenic damage [6]. Silicone implant rupture could potentially require surgical treatment with extraction of the ruptured implant. Depending on whether it is an asymptomatic or symptomatic rupture, treatment options should be discussed with the patient while presenting the potential benefits, risks, and costs of implant removal. Patients with asymptomatic rupture should be presented with a choice between continued periodic imaging or surgical treatment [3], while those with symptomatic rupture should be advised to undergo surgical treatment in order to eliminate subjective symptoms or additional clinical problems [3]. Treatment of other complications that can potentially develop as a result of rupture and imbibition of the surrounding tissue with silicone gel could also be required. The purpose of this report is to describe a potential longevity of older breast implant generations and absence of symptomatic rupture in the presented case for more than 37 years, with highlighting screening, diagnostic and treatment options.

CASE REPORT

An 81-year-old female patient was admitted to the Clinic for Burns, Plastic and Reconstructive Surgery of the University Clinical Center of Serbia in August 2020 complaining of pain and

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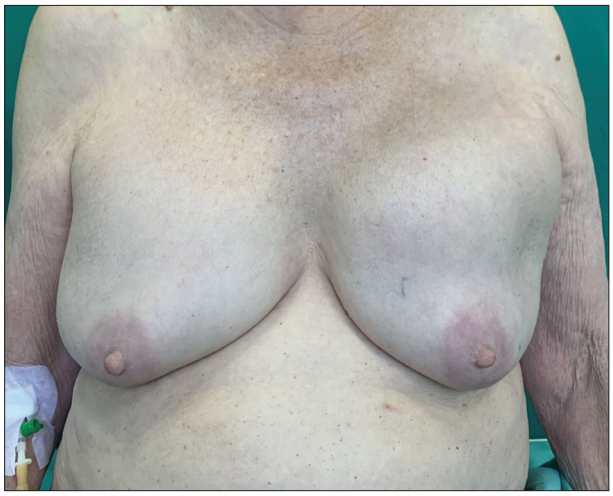

Figure 1. Clinical examination revealed breast asymmetry

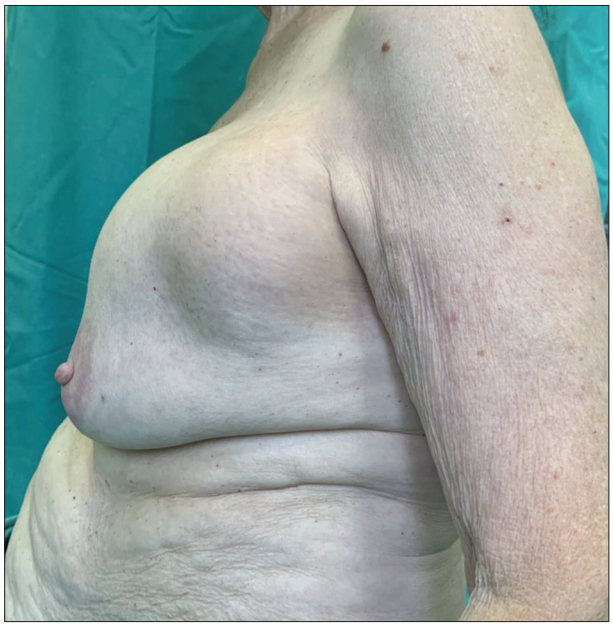

Figure 2. In the upper left quadrant, there was a tumefaction of about 5 × 5 cm, insensitive to palpation, partially fixated, of hard consistency, without signs of inflammation present

presence of tumefaction in the area of her left breast. Her medical history revealed that she had breast implants placed in 1983 for augmentation purposes. She said that she had fell five years previously and injured her chest on the left. Ever since, she could feel a tumefaction of about 1 × 1 cm that had gradually grew. Clinical examination revealed breast asymmetry (Figure 1). In the upper left quadrant there was a tumefaction of about 5 × 5 cm, insensitive to palpation, partially fixated, of hard consistency, without signs of inflammation present (Figure 2). Mammography suggested signs of herniation of the implant towards the axillary extension, i.e., differential diagnosis suggested a rupture. The right implant also had uneven edges. Ultrasound scan revealed blurred lines of the capsule in the external quadrant of the left breast above which there was a hyperechogenic area that was suggestive of imbibition of the surrounding tissue due to extravasation of the implant filling. In the upper external quadrant of the left breast, there was a non-homogenous

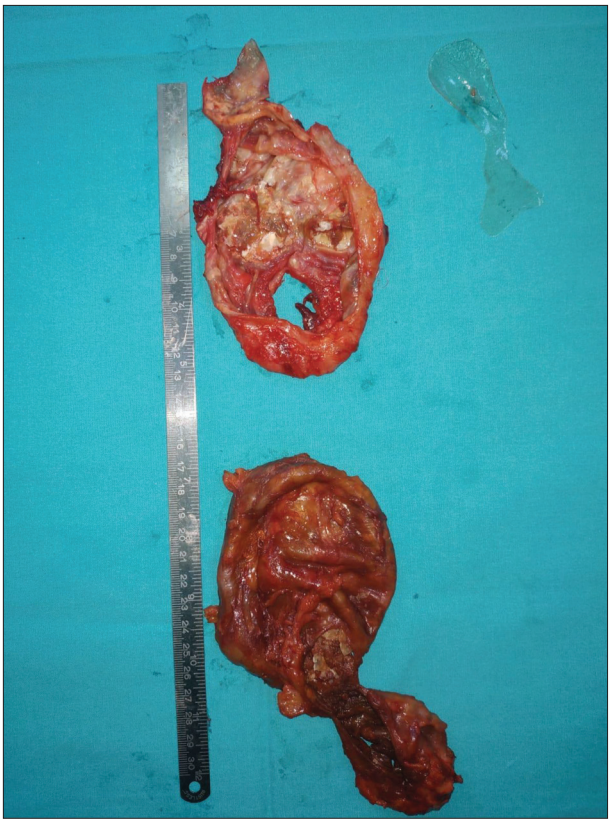

Figure 3. Both implants, both connective tissue capsules and silicone imbibed surrounding tissue were removed

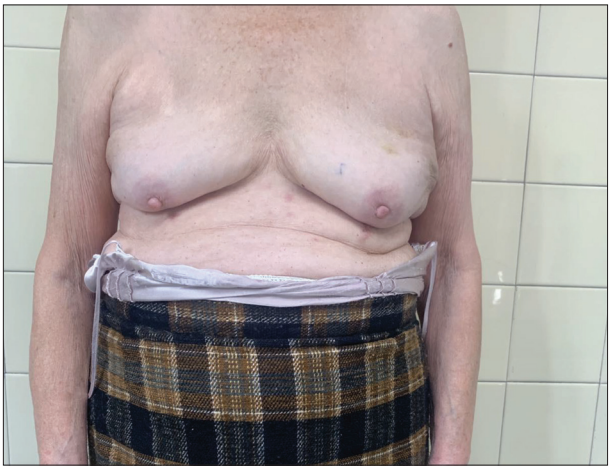

Figure 4. Postoperative follow-up

area with mildly affected tissue architecture, 26 × 14 mm, along the implant itself. Towards the axillary extension of the left breast an oval discrete structure, about 68 × 46 mm, suggestive of herniated part of the implant is seen.

On the basis of mammography, echotomography and clinical examination, surgical treatment was indicated. Both implants, both connective tissue capsules and silicone imbibed surrounding tissue were removed (Figure 3). The tissue was sent for histopathological examination. The results verified the presence of hyalinized capsule with calcifications and multinuclear giant cells filled with polarized foreign matter (silicone). On follow-up, the patient was overall satisfied with the outcome (Figure 4).

We confirm that we have read the journal's position on issues involving ethical publication and affirm that this work is consistent with those guidelines.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Written consent to publish all shown material was obtained from the patient.

DISCUSSION

A rupture can be intracapsular or extracapsular. Normal body reaction to the presence of an implant as a foreign body is to produce a fibrous tissue capsule in order to limit it. Intracapsular rupture refers to spilling of the content within the fibrous capsule. With leaking of the content beyond the fibrous capsule limits, it becomes an extracapsular rupture. An extracapsular rupture enables further spreading of the content and imbibing of the surrounding tissues. Possible symptoms of a rupture include breast asymmetry, change in the size, shape and firmness of breast, pain, palpable changes, when a rupture is symptomatic. Signs and symptoms of a silicone implant rupture usually develop later, due to slow leaking of silicone due to its higher density and lack of absorption. In most patients a rupture is not accompanied with any major signs and symptoms and is accordingly called a "silent" i.e., asymptomatic rupture [2]. Silicone implants are classified into generations on the basis of development of the external shell and gel material they are filled with.

The first generation was used in the sixties and seventies. These implants had a thick shell and highly viscous gel, resulting in very firm and long-lasting implants. The incidence of ruptures was low, but the incidence of capsular contracture and calcification was high [7]. The second generation was designed with much thinner external shell and less viscous silicone gel. As a result of these design changes the incidence of rupture was much higher and was combined with the "silicone bleeding" phenomenon, i.e., leaking of silicone into the surrounding tissue through the shell itself due to increased fluidity of the implant filling [8, 9]. High incidence of ruptures resulted in discontinuation of use of this generation of implants. The third generation of implants was used from late eighties to 1992 when the Food and Drug Administration (FDA) moratorium on the use of silicone implants came into force [10]. After pertinent trials the moratorium was lifted in 2006 and in the meantime two more generations of breast were developed, which are currently used [7].

In the management of symptomatic and asymptomatic patients several diagnostic modalities can be used in evaluation of a potential implant rupture. These are: (magnetic resonance imaging) MRI, ultrasound, computed tomography, mammography with initial clinical examination. Clinical examination on its own is not an adequate method in assessment of a suspected rupture. MRI is broadly recommended and accepted diagnostic method worldwide. Numerous studies have established its sensitivity and specificity in detection of implant ruptures at 72–94% and 85–100%, respectively [11, 12, 13]. The latest FDA recommendations relating to screening of implant patients specify the following: for asymptomatic patients, the first ultrasound or MRI should be performed at 5–6 years postoperatively, then every 2–3 years thereafter; for symptomatic patients or patients with equivocal ultrasound results for rupture at any time postoperatively, an MRI is recommended [14]. Patients with asymptomatic rupture are presented with a choice between continued periodic imaging or surgical treatment [3], Due to the absence of scientific evidence to clearly support the benefit of removing an asymptomatic ruptured implant, the decision about whether or not to do so should be left to the patient [3]. In case of symptomatic ruptured implant patients should be motivated to undergo surgical treatment in order to eliminate subjective symptoms or additional clinical problems [3]. Surgical treatment implies implant extraction with complete capsulectomy. In the reported case, convincing clinical findings accompanied with ultrasound and mammography were sufficient to suspect ruptures and indicate surgical treatment. The implants were removed on both sides also complete capsulectomy was performed with removal of the surrounding tissue imbibed with silicone. It was also noted that the right breast, preoperatively without signs or symptoms, also had some silicone gel in the capsule, together with connective tissue and macroscopically visible calcification. The patient in this particular case had an almost 40-year-old implant. We believe that these were first generation implants, having the patient's history, age, late occurrence of symptoms of rupture and macroscopic appearance of implants after extraction [7]. We report this case to show that even in almost 40-year-old implants the symptoms of rupture need not necessarily develop, having the macroscopic appearance of her right breast and absence of subjective symptoms relating to the right breast. Also, the absence of symptoms did not correlate with the local and microscopic finding inside the right breast capsule. It remains to be answered how long the patient would remain symptom-free and without any further potential complications if she had not suffered the left breast injury, as described above. The case report supports a possible need for a higher compliance with the United States FDA recommendations relating to periodic screening in order to identify asymptomatic ruptures and other implant-related complications, especially in older generation silicone implants. It is undeniable that throughout the years, breast implant technology has evolved, nevertheless implant rupture with intracapsular and extracapsular silicone leakage continues to be a problem plastic surgeons face in everyday practice. The impact of symptomatic and asymptomatic, particularly extracapsular implant rupture should be investigated further to learn more about development of further complications, overall health of patients alongside with further investigation of diagnostics, screening and management options for such complications.

Conflict of interest: None declared.

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Руптура имплантата 37 година после аугментације груди

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САЖЕТАК

Увод Силиконски имплантати у употреби су од друге половине 20. века. Током тог периода развијено је више генерација имплантата који су се разликовали на основу дебљине капсуле и вискозности силиконског гела. Кроз развој генерација имплантата, мењала се и учесталост компликација. Имплантати прве генерације показали су најмању тендецију ка руптури, али су били склонији капсуларној контрактури и формирању калцификата.

Приказ болесника Пацијенткиња стара 83 године уградила је силиконске имплантате 1983. године, а 2015. године је пала и повредила леву страну грудног коша. Након повреде долази до појаве палпабилног тумефакта у пределу леве дојке праћеног боловима. Пре повређивања негира постојање икаквих субјективних тегоба. Дијагностичким процедурама и клиничким прегледом постављена је сумња на руптуру силиконског имплантата. Оперативним налазом потврђена је руптура оба имплантата, те је учињена екстракција силиконских имплантата, капсулектомија и уклањање околног силиконом имбибираног ткива, а препарати су послати на хистопатолошку анализу.

Закључак Руптура имплантата представља једну од касних компликација аугментације груди. Учесталост руптуре мењала са развојем генерација силиконских имплантата. Мишљења смо да су код наше пацијенткиње уграђени силиконски имплантати прве генерације, узимајући у обзир време протекло од њихове уградње до појаве симптома и макроскопски изглед опне након екстракције. Чињеница је да су се ови имплантати показали као веома издржљиви, али без обзира на изостанак симптома, према савременим препорукама саветује се редован скрининг и евентуална превентивна екстракција, поготову овако старих имплантата.

Кључне речи: руптура имплантата; силиконски имплантати; аугментација груди