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CASE REPORT

Accidental injection of autologous fat into the breast implant: a case report highlighting radiological findings

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Abstract Autologous fat grafting is a popular technique for breast augmentation and improving breast contour depressions. It is a technique that involves using the patient's own adipose tissue to be applied on a subcutaneous area to increase total fat volume. Intraimplant fat is an unexpected finding after autologous fat grafting. A 51-year-old asymptomatic female who underwent breast augmentation with silicone implants and secondary breast augmentation with autologous fat grafting presented with unidentified cluster of radiolucencies superimposed to left implant on screening mammogram. Corresponding MRI revealed intraimplant fat intensities. This case represents a previously unreported intraimplant injection of fat with resultant intracapsular rupture and highlights the radiological findings of intracapsular implant rupture.
Level of Evidence: Level V, diagnostic study.

Keywords Breast implants · Autologous fat grafting · Complications

Introduction

Autologous fat grafting was performed widely throughout the twentieth century for breast augmentation and improving breast contour depressions. It is a technique that involves using the patient's own adipose tissue to be applied on a subcutaneous area to increase total fat volume [1–3]. Autologous fat harvested from patient's own donor sites such as the thighs, the lower abdomen, and the buttocks and can be used to correct deformities [4]. American Society of Plastic Surgeons (ASPS) suggested to quit the use of the fat grafting due to the complications in 1987 [4]. After an improvement of the fat grafting technique by Coleman, its usage became popular again in aesthetic plastic surgery [5]. Several studies reported the post-procedure complications of fat grafting like cysts, calcifications, or fat necrosis [4, 6, 9–11]. Herein, we present a radiological finding of previously unreported iatrogenic intracapsular rupture due to the accidental injection of fat into the breast implant.

Case report

A 51-year-old female underwent bilateral breast augmentation by silicone implant at a local cosmetic clinic 5 years before presentation. She also had undergone autologous fat grafting 3 months after the surgery for improving contour depression that occurs after breast augmentation and reducing the visibility of the implant. Physical examination showed no abnormality.

On her screening mammogram, the left implant was irregular and there was a high density area surrounding the implant, suggesting intracapsular fluid. In addition, a cluster of nodular radiolucencies superimposed to the inferior margin of the left implant was seen (Fig. 1). Corresponding axial non fat saturated and fat saturated T1 MRI scan revealed intraimplant nodular fat intensities representing accidental intraimplant injection of fat (Fig. 2). Axial short tau inversion recovery MRI scan showed minimally collapsed implant with intermediate signal intensity free silicone outside the implant shell due to intracapsular rupture (Fig. 3). Gray scale ultrasound showed discontinuity of implant shell consistent with definitive rupture and slightly echogenic fluid through the fibrous capsule and the shell (Fig. 4).

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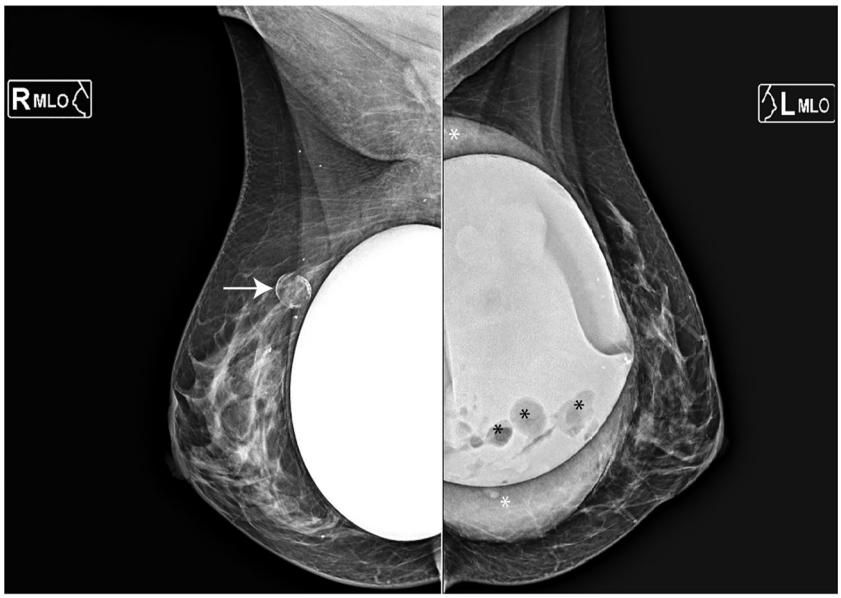

Fig. 1 Mammograms show bilateral retropectoral silicone implants. There is a cluster of nodular radiolucencies (*black asterisks*) superimposed to the inferior margin of the left implant. A high density area surrounding the implant (*white asterisks*) suggesting intracapsular fluid. Right mediolateral oblique view shows well circumscribed radiolucency (*arrow*) with peripheral calcifications suggesting fat necrosis. *RMLO* right mediolateral oblique, *LMLO* left mediolateral oblique

Discussion and conclusion

The median life span of silicone breast implant is said to be approximately 16.4 years. However, this does not accurately reflect the number of undetected or clinically occult ruptures. Ruptured implants that are clinically occult can be detected by imaging methods. Intracapsular rupture occurs when the polyurethane shell is disrupted but the surrounding fibrous capsule is still intact [1–3]. On mammograms, the form of the implant is usually protected; however, ruptured silicone breast implant may seem like enlarged [6].

Fig. 2 Corresponding axial non fat saturated (**a**) and fat saturated (**b**) T1 weighted images show intraimplant signals isointense to fat in both two sequences consistent with intraimplant fat (*white asterisks*)

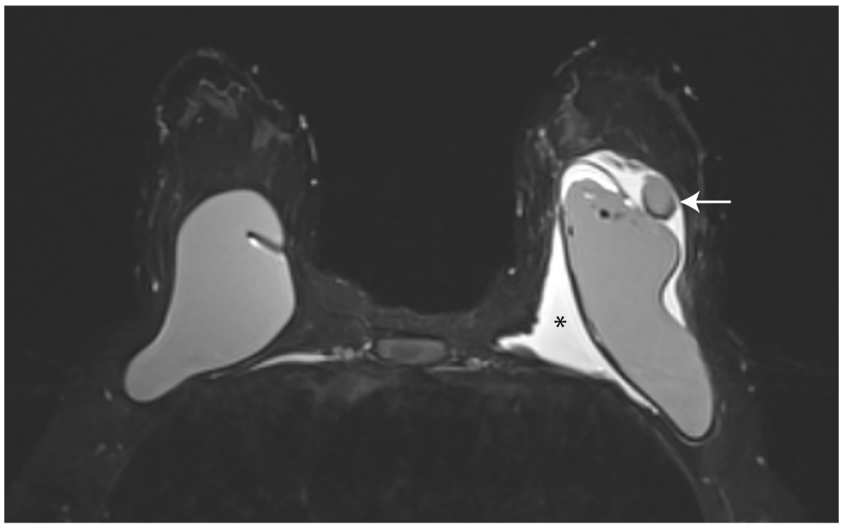

Fig. 3 Axial short tau inversion recovery MR image shows minimally collapsed implant with free silicone (intermediate signal intensity) outside the implant shell due to intracapsular rupture (*arrow*). A moderate amount of fluid between the fibrous capsule and the shell is seen (*black asterisk*)

Ultrasound can detect implant rupture with a sensitivity of 50–77% and a specificity of 55–84% [7]. The slightly echogenic fluid may be seen between the shell and the fibrous capsule but this sign is not definitive and should be interpreted carefully. Furthermore, discontinuity of echogenic lines of shell may be seen as a definitive rupture sign.

The most valuable imaging method for evaluation of breast implant rupture is MRI, with a sensitivity of 74–100% and a specificity of 63–100%, depending on the technique [8]. On initial phases, separation of the membranes with respect to the fibrous capsule could be identified with presence of silicone between the shell and fibrous capsule.

Autologous fat grafting is a popular technique for breast augmentation and improving breast contour depressions. Several studies have addressed the post-procedure imaging findings and complications of fat grafting. Ozalp B. et al. reported cyst formations and grade 2 capsular contracture after primary augmentation with silicone implant and secondary augmentation with autologous fat grafting [9]. In the series published by Carvajal and Patino, 20% of the patients had uncalcified and 20% had calcified fat necrosis after fat grafting [10]. The prevalence of complications after fat grafting in the review study published by De Decker M. et al. was the following: fat necrosis in 5.31%, cysts or calcifications in 8.78%, and infections in 0.96% [9]. Lumps, cysts, and fat necrosis are most commonly reported complications of fat grafting in another study and occurred in only a small proportion of patients [4]. Likewise, in our case, there was a peripherally calcified radiolucency in the right breast that suggests fat necrosis due to prior autologous fat grafting.

Fig. 4 Gray scale ultrasound image shows discontinuity of implant shell (*arrow*) consistent with definitive rupture. Slightly echogenic fluid between the fibrous capsule and the shell is seen (*white asterisk*)

To our knowledge, this is the first written report about the accidental intraimplant injection of autologous fat with resultant intracapsular implant rupture. Intraimplant fat signal on MRI with intraimplant low densities on mammography is diagnostic with the patient's history of fat grafting.

As a conclusion, women undergoing secondary breast augmentation by fat grafting may lead to diagnostic interpretive dilemma during radiologic assessment because the post-procedure breast has variable presentations. The radiologists have to be familiar with the broad spectrum of presentations. Ultrasound-guided injections can be useful and may decrease the complications. It is recommended that temporary removal of the implant while performing fat grafting to avoid implant rupture. After the procedure, detailed radiologic assessment is needed and abnormal clinical and radiological findings should be reported.

Compliance with ethical standards

Conflict of interest Levent Celik, Rahmi Cubuk, Gozde Arslan, Mehmet Mahir Atasoy, Levent Celik declare that they have no conflict of interest.

Informed consent Informed consent was obtained from the participant included in the study.

Ethical approval For this kind of article formal consent from a local ethics committee is not required.

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