pISSN 2384-1095
eISSN 2384-1109

iMRI 2022;26:76-81

https://doi.org/10.13104/imri.2022.26.1.76

iMRI
Investigative Magnetic Resonance Imaging

Unilateral Chronic Organizing Hematoma after Breast Explantation Mimicking Chest Wall Tumor: a Case Report with Imaging Features

Seon Woong Jang, Ji Young Lee

Department of Radiology, Ilsan Paik Hospital, Inje University College of Medicine, Goyang, Korea

The number of women undergoing breast augmentation surgery with a prosthesis for cosmetic purposes or reconstruction after a mastectomy is steadily increasing. Hematoma is one of complications associated with breast augmentation surgery. It usually occurs early in the postoperative period. It rarely occurs late (after six months). However, chronic hematomas after prosthesis removal have not yet been reported in the radiological literature. We present a case of unilateral chronic organizing hematoma that developed late and grew persistently over long period after breast explantation, mimicking a soft tissue tumor of the chest wall clinically. Meanwhile, characteristic magnetic resonance imaging features of heterogeneous signal intensities on T1-weighted and T2-weighted images and dark signal intensity with a persistent enhancement of the peripheral wall of the lesion were found. These can be used for a differential diagnosis.

Keywords: Breast augmentation; Breast implant removal; Chronic hematoma; Magnetic resonance imaging

Case Report

Received: November 8, 2021
Revised: January 21, 2022
Accepted: January 28, 2022

Correspondence to:
Ji Young Lee, M.D.
Department of Radiology, Ilsan Paik Hospital, Inje University College of Medicine, 170 Juhwa-ro, Ilsanseo-gu, Goyang, Gyeonggi-do 10380, Korea.
Tel. +82-31-910-7606
Fax. +82-31-910-7369
E-mail: drleeji@paik.ac.kr

INTRODUCTION

The number of women undergoing breast augmentation surgery with a prosthesis for cosmetic purposes or reconstruction after a mastectomy is steadily increasing. Complications (both common and uncommon) related to this surgery are well-known. They have been reported in the literature (1). Early postoperative complications include peri-implant fluid collection or hematoma and infection. Late implant-related complications that usually occur at six months after surgery include capsular contraction, foreign body reactions, intracapsular or extracapsular rupture, and reactive lymphadenopathy (1, 2). Some of these complications and recent concerns for anaplastic lymphoma associated with breast implant require removal of the implanted prosthesis which could result in breast explantation-related complications, including pneumothorax, hematoma, infection, and deep vein thrombosis (3, 4).

Early hematoma, which occurs primarily early after surgery (usually within the first three days), is a well-known complication with an incidence of 2-10.3% in breast implant surgery. However, late hematoma that occurs at six months after surgery is very rare in implant-based breast augmentation surgery (2). It is even less frequent

after implant removal. To the best of our knowledge, only one case of late hematoma formation after explantation of breast implant has been published in plastic surgery (5). Late hematoma after breast implant removal in radiologic literature focusing on imaging features has not been reported yet. Herein, we present a case of chronic organizing hematoma mimicking a soft tissue tumor of the chest wall that developed late and grew slowly after explantation. It caused diagnostic dilemma clinically.

CASE REPORT

A 40-year-old woman presented to our institution for further evaluation of an abnormal mass-like lesion depicted in ultrasound (US) examination at an outside hospital. Her symptoms consisted of a more slow and progressive protrusion of her right breast and anterior ribs compared to the left side that had been present for about four years. On US performed at the outside clinic, a large, well-circumscribed, heterogeneous hypoechoic mass was seen beneath the pectoralis major muscle in the right breast (Fig. 1). She did not present with any discomfort or febrile sense in her right breast. She denied any history of trauma to the chest. She also denied the use of medication including aspirin or anticoagulants. She had no remarkable medical history that might cause coagulopathy. Physical examination showed a firm and fixed mass in 3 o'clock direction of the right breast without overlying skin color change. Laboratory tests were within normal ranges. She had undergone a cosmetic augmentation mammoplasty with silicone prosthesis 17 years ago in an aesthetic clinic. The implant was removed two years thereafter. The attending physician suspected a rib origin bone tumor or chest wall soft tissue tumor and performed chest computed tomography (CT).

On chest CT scan, a well-defined oval-shaped lesion was seen in the subpectoral area abutting the right chest wall with poor enhancement (Fig. 2a, b). The density of the

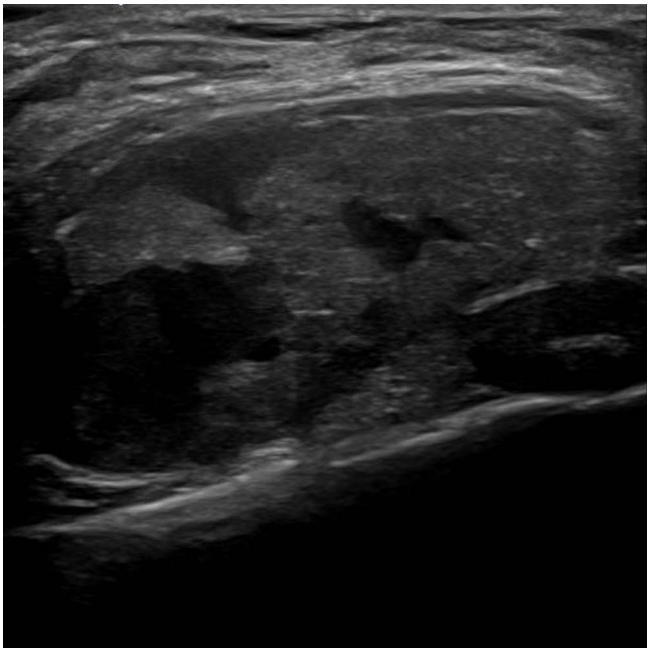
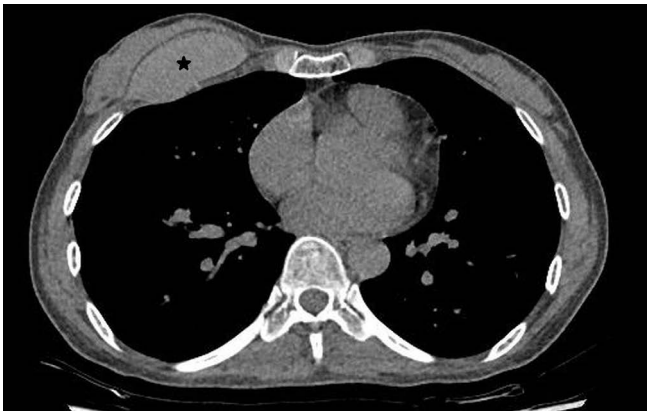
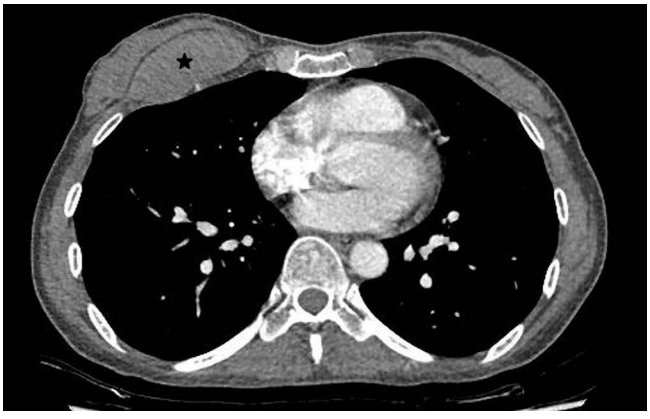


Fig. 1. On ultrasound performed in an outside clinic, a large heterogeneous hypoechoic mass with echogenic rim is seen in the right chest wall under pectoralis major muscle.



a

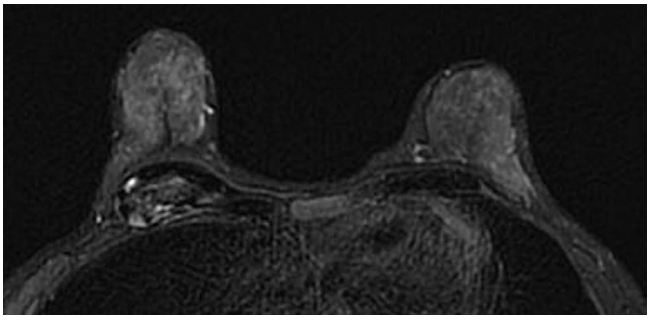


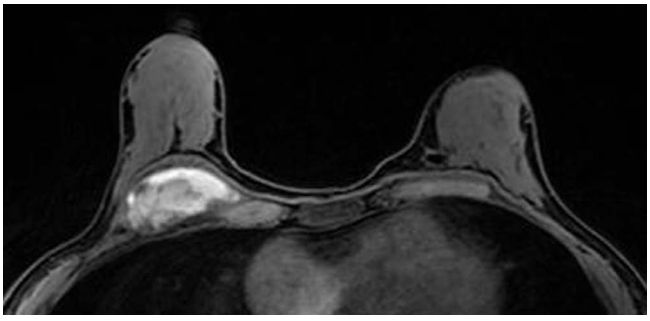
b

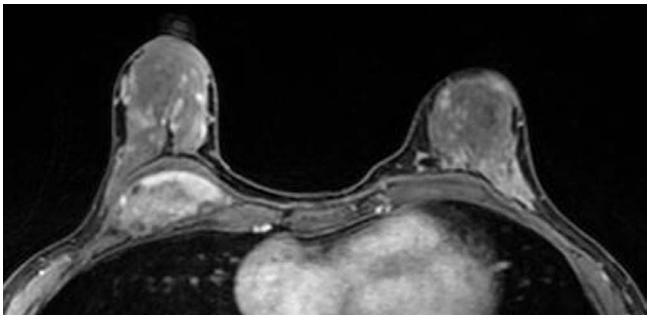
Fig. 2. (a, b) Chest CT with contrast enhancement showing a well-defined oval shaped mass in the right chest wall. The density of the mass was measured as 60-70 HU on both pre-contrast image (a) and contrast-enhanced image (b). There was no contrast enhancement or change in HU.

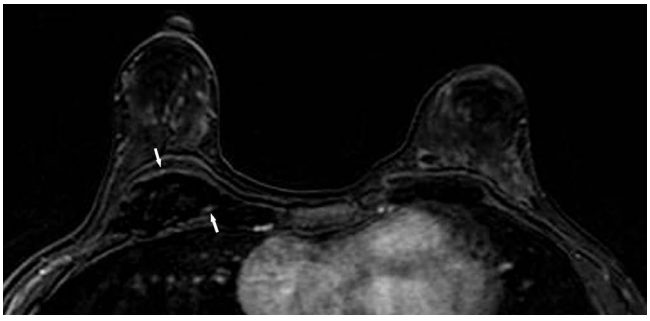
lesion was 60-70 Hounsfield units (HU) on the pre-enhance scan and 60-70 HU on the contrast-enhanced scan. There was no internal calcification or adjacent bony destruction. The lesion was separated from adjacent ribs. The possibility of a rib-origin bone tumor was excluded.

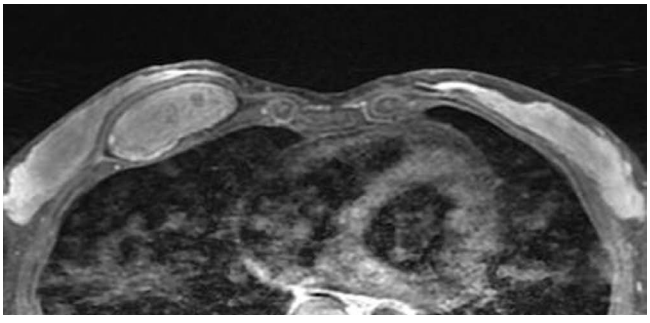
To evaluate its origin and components, breast magnetic resonance imaging (MRI) with contrast enhancement was conducted using a 3.0-T scanner. MRI revealed an 8.7 × 5.5 × 2.5 cm-sized, well-circumscribed mass lesion under the pectoralis major muscle in the right chest wall. Internal

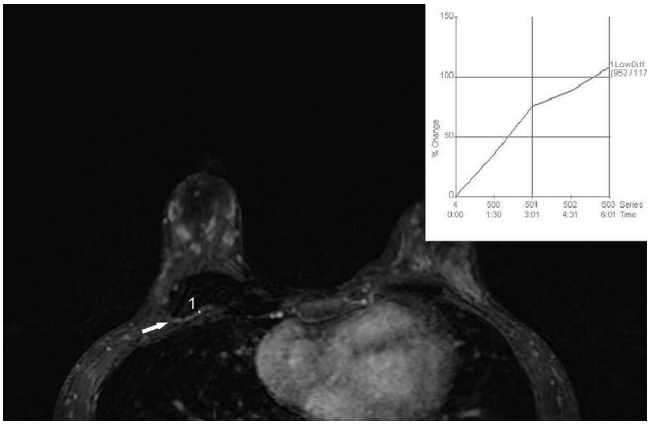

a


b


c

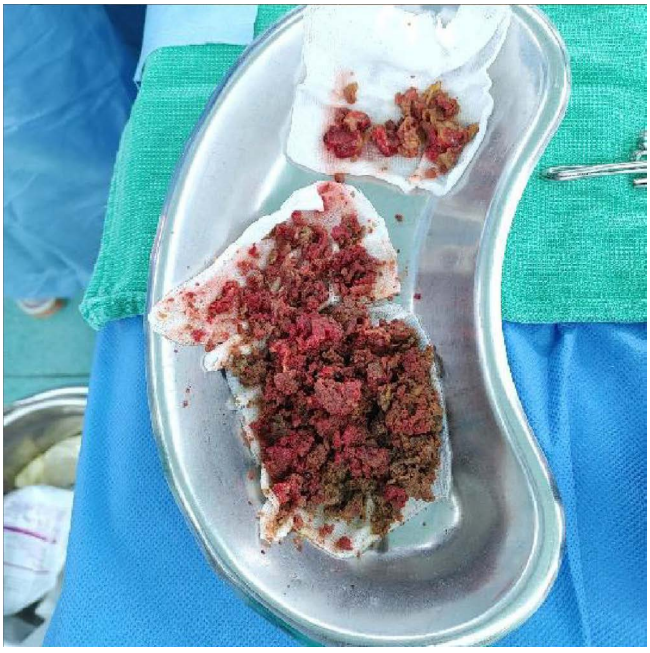

d


e

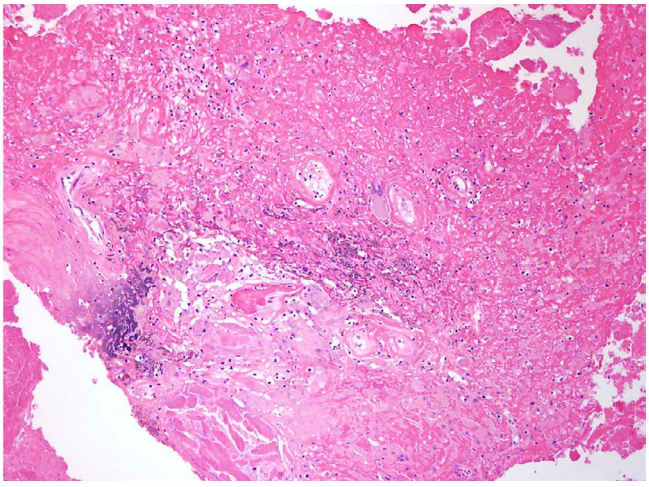


f

Fig. 3. Dynamic breast MRI image using a 3.0-T scanner with intravenous contrast administration. (a) STIR image showing a dark intense lesion with multifocal high SI foci. (b) T1-weighted axial image showing a heterogeneous lesion with mainly high signal intensity compared to the pectoralis muscle. Low signal intensity rim was found for both signals. (c, d) Contrast-enhanced fat suppressed T1-weighted image and subtraction image showing thin wall and a few tiny nodular enhancements at the peripheral portion of the mass (arrows). (e) Fat suppressed T1-weighted image using surface coil on supine position showing apparent thin low SI peripheral rim. (f) The kinetic curve of dynamic enhancement showing a persistent enhancement pattern.



a



b

Fig. 4. Photograph of evacuated hematoma assumed to be old blood clot (a). On histopathological examination, the resected specimen showed organizing hematoma characterized by a mixture of blood, fibrin exudation, dilated vessels, and hemosiderin pigments (Hematoxylin & Eosin staining, × 100) (b).

contents of the mass showed a heterogeneous low signal intensity on short tau inversion recovery (STIR) images (Fig. 3a) and heterogeneous high signal intensity on T1-weighted images (Fig. 3b). Thin low signal intensity peripheral rim was noted on both STIR images and T1-weighted images (Fig. 3a, b, e). On contrast-enhanced T1-weighted images with fat suppression, thin wall and a few tiny nodular enhancements at the peripheral portion of the mass were seen (Fig. 3c, d), showing persistent kinetics upon dynamic enhancement (Fig. 3f). Diffusion restriction was not shown on diffusion-weighted images. The mean apparent diffusion coefficient (ADC) was 1.64×10^{-3} mm^2 /sec.

The presumptive diagnosis was organizing hematoma in the subpectoral area. The differential diagnosis included near totally necrotic or hemorrhagic change of benign soft tissue mass. We performed a US-guided aspiration biopsy using an 18G needle. Dark bloody fluid was aspirated. A sample of the fluid was sent for cytologic examination, which confirmed that it was only a necrotic material.

The patient underwent surgical excision of the lesion. Hematoma and old blood clots were evacuated (Fig. 4a). After evacuation and irrigation, blood oozing at the site was observed. Histopathological examination of the excised lesion revealed a mixture of blood, fibrin exudation, dilated vessels, and hemosiderin pigments, consistent with organizing hematoma (Fig. 4b). The patient had an unremarkable postoperative course. There was no recurrent bleeding at follow-up US after six months.

DISCUSSION

According to previous literature, incidence rates of complications related to breast explantation with or without capsulectomy are relatively low. Rates of major complications (including pneumothorax, hematoma requiring evacuation, infection, and deep vein thrombosis) of 2.4-2.7% and rates of minor complications (including seroma, liquefied hematoma, and wound infection) of 4.4% have been reported (3, 4). Most complications occurred early in the postoperative period within six months (4). There is only one case report of late hematoma formation after breast implant removal (5). In that case, the patient underwent a breast implant removal 10 years prior and recently started anticoagulation therapy for deep vein thrombosis four months before the hematoma diagnosis. They suggested that as the new anticoagulant treatment began, the bleeding occurred from insufficiently shrink

blood vessels within the rigid unremoved fibrous capsule. Our case was similar in that the patient had undergone augmentation mammoplasty 17 years ago and the implant was removed two years later. However, it differed from the prior report as there were no leading or predisposing factors to cause the spontaneous bleeding thereafter.

Hematomas are usually reabsorbed. They gradually decrease in size over time. However, on rare occasions, they can persistently grow, mimicking soft tissue neoplasm. Chronic expanding hematoma is an entity first described by Reid et al. (7). It has been reported in other anatomic locations. It can also occur in the breast with an implant (6). It has a characteristic structure consisting of a central part composed of fresh and altered blood and granulation tissue with a peripheral wall composed of dense fibrous tissue (7) due to recurrent bleeding cycles of chronic inflammation and increased capillary permeability caused by breakdown products of the hematoma (6, 7). There have been occasional reports of chronic or late hematoma with progressive growth as complications of breast prostheses (2, 6). The pathogenesis of these hematomas seems to involve chronic expanding hematoma.

US, CT, and MRI are imaging modalities used in the diagnosis of soft tissue hematoma. MRI, in particular, is the best for characterizing internal contents and determining their relationship to surrounding tissues. Imaging features of chronic expanding hematoma vary depending on the age of hemorrhage. The central component appears to be heterogeneous on both T1- and T2-weighted images. The peripheral rim is seen frequently with dark signal intensity on T2-weighted images. These findings reflect histologic characteristics such as mixed breakdown products from hemorrhage, necrotic degradation and liquefaction, granulation tissue with fragile capillary vessels, dense fibrosis, hemosiderin deposits, and iron-laden macrophages (7, 8). Our case corresponds well to these clinical and imaging features of chronic expanding hematoma as described above.

Chronic hematoma can sometimes mimic soft tissue tumors due to its persistent and slowly increasing clinical presentation. Undifferentiated pleomorphic sarcoma, previously termed as malignant fibrous histiocytoma, is the most common malignant soft tissue tumor in adults. It usually shows intermediate to low signal intensity on T1-weighted images and intermediate to high signal intensity on T2-weighted images on MRI (9). However, when accompanied by internal hemorrhage, it can exhibit variable signal intensities, making it difficult to distinguish it from chronic hematoma.

The important finding in distinguishing hematoma from hemorrhagic soft tissue tumors is internal enhancement. Nodular or irregular enhancement of part or parts of the lesion is strongly indicative of tumor due to underlying tumor tissue displaced by intratumoral hemorrhage (10). Hematoma usually shows peripheral thin rim enhancement. In some cases, internal enhancement can be observed because of dense fibrous capsule and internal granulation tissue (8, 10). Clinical information for previous trauma or operation can be helpful for the differentiation. However, if internal enhancement is seen within the mass, the possibility of soft tissue tumor cannot be excluded and a close follow-up or further evaluation is recommended. Dynamic contrast enhancement study and diffusion-weighted images are also helpful as findings such as no early arterial enhancement and no diffusion restriction would suggest benign condition rather than malignant soft tissue tumor (8).

In summary, although chronic hematoma occurs rarely in association with breast augmentation with an implant, it can occur after explantation. Being aware of this rare entity and its characteristic imaging features may help proper management of a patient with breast surgery-related complications. MRI is very helpful for its differential diagnosis.

REFERENCES

1. Raj SD, Karimova EJ, Fishman MDC, et al. Imaging of breast implant-associated complications and pathologic conditions: breast imaging. Radiographics 2017;37:1603-1604
2. Fioramonti P, Lovero S, Kaciulyte J, Ribuffo D, Frattaroli JM. An unusual case of late hematoma after imlant-based breast reconstruction mimicking an anaplastic large cell lymphoma: a case report and literature review. Eur J Plast Surg 2022;45:1-10
3. Rohrich RJ, Beran SJ, Restifo RJ, Copit SE. Aesthetic management of the breast following explantation: evaluation and mastopexy options. Plast Reconstr Surg 1998;101:827-837
4. Katsnelson JY, Spaniol JR, Buinewicz JC, Ramsey FV, Buinewicz BR. Outcomes of implant removal and capsulectomy for breast implant illness in 248 patients. Plast Reconstr Surg Glob Open 2021;9:e3813
5. Park SH, Park ES, Kang SG. Late capsular hematoma after prosthesis removal following aesthetic breast

augmentation: a case report. Arch Aesthetic Plast Surg 2017;23:96-100
6. Daw JL, Lewis VL, Smith JW. Chronic expanding hematoma within a periprosthetic breast capsule. Plast Reconstr Surg 1996;97:1469-1472
7. Reid JD, Kommareddi S, Lankerani M, Park MC. Chronic expanding hematomas. A clinicopathologic entity. JAMA 1980;244:2441-2442
8. Lee J, Lee T, Oh E, Yoon YC. Temporal evolution of a chronic expanding organizing hematoma on MRI, including functional MR imaging techniques: a case report. Investig Magn Reson Imaging 2017;21:43-50
9. Nam SJ, Kim S, Lim BJ, et al. Imaging of primary chest wall tumors with radiologic-pathologic correlation. Radiographics 2011;31:749-770
10. McKenzie G, Raby N, Ritchie D. Pictorial review: Non-neoplastic soft-tissue masses. Br J Radiol 2009;82:775-785