

# Interstitial Injection Mammoplasty Mimicking Diffuse Infiltrative Disease in a Male Patient<sup>1</sup>

남성 환자에서 침윤성 유방질환과 혼동되는 주입 유방성형술<sup>1</sup>

In Hye Chae, MD<sup>1</sup>, Eun Suk Cha, MD<sup>1</sup>, Ji Eun Lee, MD<sup>1</sup>, Jin Cheong, MD<sup>1</sup>, Sun Hee Sung, MD<sup>2</sup>

Departments of <sup>1</sup>Radiology, <sup>2</sup>Pathology, Ewha Womans University School of Medicine, Mokdong Hospital, Seoul, Korea

Foreign material injection for breast augmentation has been performed for decades, primarily in Asia. Various materials have been used clinically for injection; their typical imaging findings are well-known and have been reported in many cases. However, these cases usually involve an injection of a foreign material for female breast augmentation. We report here the unusual imaging findings in a 64-year-old male with lipogranulomatous inflammatory changes in his breast, caused by an interstitial injection of paraffin. Mammograms show the enlargement of both breasts as well as an increased density with combined skin and trabecular thickening. Ultrasonography revealed bilateral, severely thickened skin and diffuse edematous change along the subcutaneous fat layer. Further, a few oil cysts and ill-defined hypoechoic lesions with posterior acoustic shadowing were noted in both breasts.

## Index terms

Injection Mammoplasty  
Mammography  
Breast Sonography

## INTRODUCTION

Several different injectable materials have been used for breast augmentation in females, such as liquid silicone, autologous fat, liquid paraffin, and polyacrylamide gel (1-3). Imaging findings for each material are well-known, with typical mammographic and sonographic features; hence, their presence is readily diagnosed. However, a spiculated mass or diffuse infiltrative change can sometimes mimic breast malignancy or other systemic diseases (4). In this report, we present a bilateral diffuse infiltrative disease that mimics the imaging findings of a male patient who underwent foreign material injection for breast augmentation.

## CASE REPORT

A 64-year-old male patient was presented to our breast center with a diagnosis of gradual breast enlargement when he was an

inpatient at our hospital for cerebral infarction. On physical examination, the patient had bilateral enlarged breasts, retracted nipples, and scarring on the mid-upper side of the left breast.

An ultrasound examination was initially undertaken for gynecomastia. A two-dimensional ultrasound (IU22, Philips Medical System, Bothell, WA, USA) with a high-frequency probe (5-12 MHz linear transducer) showed bilateral, severely thickened skin and diffuse edematous change along the subcutaneous fat layer. A few cysts, which were variable in size and round-to-oval hypoechoic masses, were seen in both breasts. In the center portion of both breasts, there were ill-defined hypoechoic lesions with markedly posterior acoustic shadowing. Also, large hyperechoic mass-like lesions were noted in both axillae (Fig. 1A-C). A standard two-view mammography was performed, which demonstrated marked enlargement of both breasts with diffusely increased density, diffuse surface skin thickening, and trabecular thickening. Furthermore, the nipple of the left breast was re-

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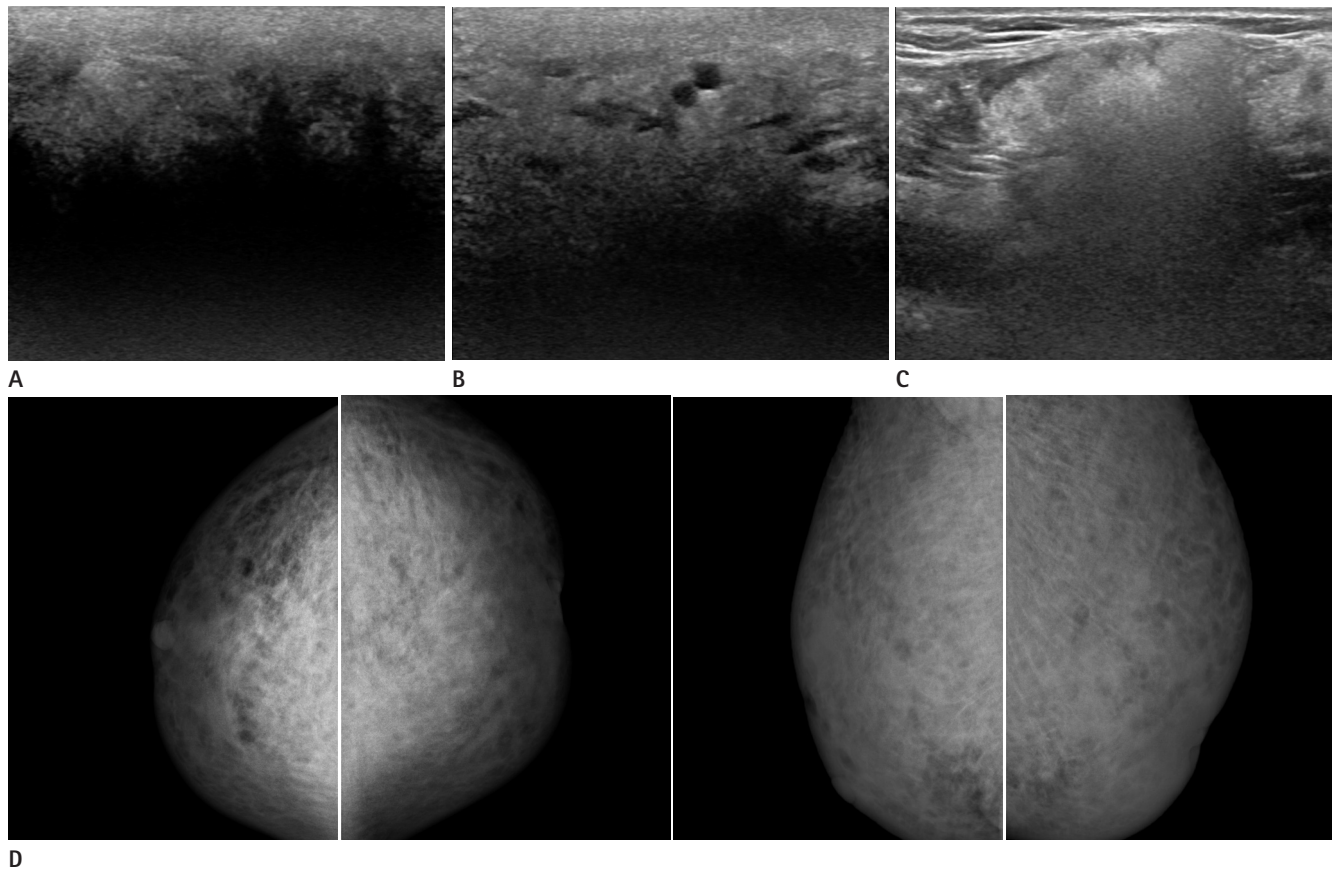
Corresponding author: Eun Suk Cha, MD

Department of Radiology, Ewha Womans University School of Medicine, Mokdong Hospital, 1071 Anyangcheon-ro, Yangcheon-gu, Seoul 158-710, Korea.

Tel. 82-2-2650-5899 Fax. 82-2-2650-5302

E-mail: escha@ewha.ac.kr

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**Fig. 1.** A 64-year-old male patient with breast enlargement. Breast ultrasound showed diffuse edematous changes along the subcutaneous fat layer and surface skin thickening in both breasts.  
**A.** Diffuse intraparenchymal shadowing similar to the "snowstorm" appearance was seen in the center of both breasts.  
**B.** Round-to-oval anechoic cysts, suggestive of oil cysts, were seen in both breasts.  
**C.** Paraffin uptake by lymph nodes was seen as diffuse increased echogenic lesions with dirty acoustic shadowing in both axillae.  
**D.** Bilateral standard mammograms showed enlargement of both breasts and increased density with combined skin and trabecular thickening.

tracted (Fig. 1D).

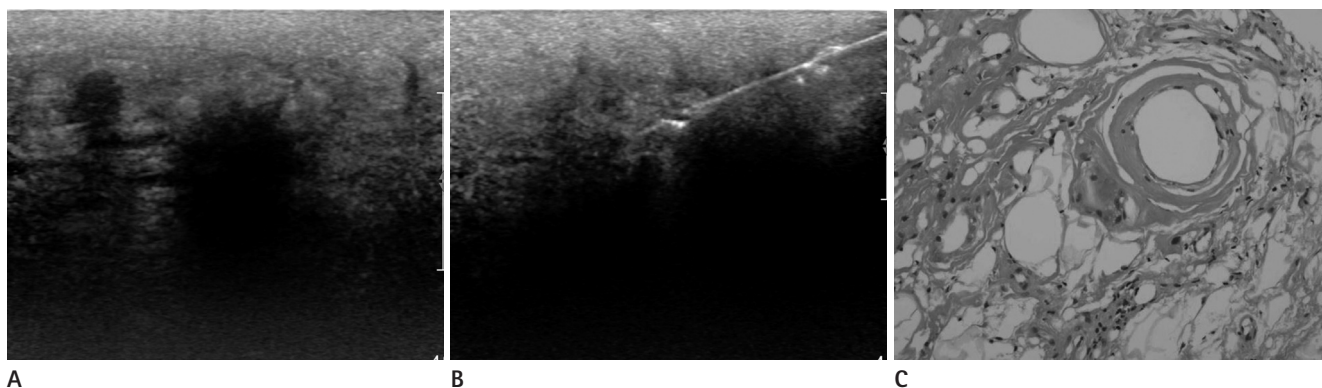
First, we suspected diffuse infiltrative disease, such as lymphoma or diabetic mastopathy. We did not consider the possibility of interstitial injection, because the patient was a normal married man. Accordingly, we recommended an ultrasound-guided biopsy; however, he did not want to undergo further examination and ultimately, left the hospital.

About 14 months later, the patient revisited our breast center due to exacerbated breast enlargement and heating sensation. He underwent an ultrasound examination again as well as an ultrasound-guided core biopsy using a 14-gauge needle, which led to the pathological diagnosis of lipogranulomatous inflammation with severe sclerosis in both breasts (Fig. 2). A pathologist recommended that we should check for a history of interstitial injection. The patient then admitted that he had undergone bilateral breast injection with his friends just for fun almost 30 years

ago. He was not forthcoming about the details of this procedure.

## DISCUSSION

The injection of various materials for breast augmentation was first used in the early 1900s (2, 3). Several injectable materials, such as liquid silicone, autologous fat, liquid paraffin, and polyacrylamide gel have been used for breast augmentation in females. Liquid silicone injection appears on mammography as well-defined, rounded, peripherally calcified masses (2). Liquid paraffin injection appears as circumscribed, noncalcified masses, streaky opacities, architectural distortion, or dystrophic or ring-like, calcified indistinct mass (paraffinoma) on mammography (2, 3). Autologous fat injection is presented as various forms of fat necrosis on mammography. Polyacrylamide gel injection appears as a single or multiple fluid collections in the ret-



**Fig. 2.** Follow-up sonography 14 months later.

**A.** Breast ultrasonography showed ill-defined hypoechoic lesions with diffuse intraparenchymal shadowing in both breasts without interval change.

**B.** Ultrasound-guided core needle biopsy using a 14-gauge needle was performed in the upper portion of both breasts.

**C.** Photomicrograph showed foreign body granuloma with severe sclerosing lipogranulomatous inflammation, compatible with paraffinoma (hematoxylin & eosin;  $\times 200$ ).

roglandular area on mammography (1, 5). These relatively typical findings of foreign material injection for breast augmentation have been reported mostly in female patients.

In this report, we describe the imaging findings of foreign material injection (paraffin) for breast augmentation in a male patient. To our knowledge, this is the first case report of foreign material injection for breast augmentation in a male patient. Our patient complained of gradual breast enlargement. Mammography demonstrated markedly enlarged breasts with increased density, combined with skin and trabecular thickening. An ultrasonography demonstrated a few oil cysts and ill-defined hypoechoic lesions with posterior acoustic shadowing in both breasts. Enlarged lymph nodes with central echogenicity were noted in both axillae. Thus, diffuse infiltrative disease, such as lymphoma or diabetic mastopathy, was strongly suspected. There are two types of lymphoma of the breast: the solitary or multiple mass-forming type and the infiltrative type (6). In the infiltrative type of lymphoma, diffuse opacification and trabecular and skin thickening may be present on mammography, whereas irregular oval hypoechoic masses with posterior acoustic shadowing may be present on sonography. Unilateral or bilateral abnormal axillary nodes are the most common mammographic finding in systemic lymphoma. Diabetic mastopathy occurs primarily in patients with a history of long-term insulin-dependent (type 1) diabetes. Mammography demonstrates asymmetric density with ill-defined margins; however, it does not show microcalcifications or dense glandular tissue. Sonography shows a hypoechoic mass or marked acoustic shadowing (7).

Pathological examination revealed lipogranulomatous inflammation with severe sclerosis, compatible with the injection of paraffin. Lipogranulomatous or oleogranulomatous mastitis is a well-known complication following the injection of melted petroleum jelly, such as liquid paraffin or silicon, into the breasts (8). There are two presenting types of oleogranulomatous mastitis: suppurative and nonsuppurative. In the suppurative type, masses may ulcerate and become infected to form a discharging sinus or a fistula tract. The surface skin of the breast may also shows a brownish discoloration. An inverted nipple, peau d'orange or enlarged lymph node may be present. However, unlike suppurative mastitis, the skin overlying the breast is often normal in the nonsuppurative type (9).

In conclusion, foreign material injection for breast augmentation in males shows various imaging findings. Sometimes these are strongly suggestive of malignancy or other systemic disease. Radiologists should be familiar with the spectrum of the appearance of foreign material injection for breast augmentation. Regardless of sex, detailed history taking and pathological confirmation by means of core-needle biopsy are important for the prevention of misinterpretation and, by extension, mistaken treatment.

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## 남성 환자에서 침윤성 유방질환과 혼동되는 주입 유방성형술<sup>1</sup>

채인혜<sup>1</sup> · 차은숙<sup>1</sup> · 이지은<sup>1</sup> · 정 진<sup>1</sup> · 성순희<sup>2</sup>

유방성형을 위해 유방에 이물질 주입하는 것은 수십 년간 주로 아시아 지역에서 행해져 왔다. 임상적으로 사용되는 물질은 다양하며, 이들의 특징적인 영상학적 소견은 많은 증례에서 이미 보고되어 잘 알려져 있다. 그러나, 이미 보고된 증례들의 대부분은 여성 환자를 대상으로 한 것이다. 저자들은 파라핀 주입으로 지방육아종성 염증성 변화를 보인 64세 남자 환자의 특이한 영상 소견에 대하여 보고하고자 한다. 유방촬영술상 양측 유방이 매우 커져있었고, 유방 피부와 섬유주가 매우 두꺼워져 있었다. 유방초음파상 피부와 피하지방층에 전반적인 부종성 변화가 있었으며, 몇 개의 지방낭종과 후방 음향 음영을 동반한 저에코성 병변이 발견되었다.

이화여자대학교 의과대학 목동병원 <sup>1</sup>영상의학과, <sup>2</sup>병리과