Local inflammation and extravasation in the injection site of hydrophilic polyacrylamide gel

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Section: Breast imaging
Area of Interest: Breast
Procedure: Diagnostic procedure
Technique: Ultrasound
Technique: Mammography
Technique: MR
Special Focus: Inflammation Case Type: Clinical Cases
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Patient: 41 years, female

Clinical History:

A 41-year-old female patient was referred with left breast asymmetry due to painless swelling without fever. She underwent augmentation mammoplasty with hydrophilic polyacrylamide gel (PAAG) 6 years ago and was administered silicone implants 2 years after PAAG injection. There were palpable masses in bilateral breasts according to the physical examination.

Imaging Findings:

The patient underwent ultrasound (US), mammography (MG), and magnetic resonance imaging (MRI) examinations. The US revealed hypoechoic retropectoral silicone prostheses and there were well defined, multiple, hypoechoic, heterogeneous collections (thick arrows). The collections in the left breast were more heterogeneous with honeycomb appearance (thin arrows). The MG examination was performed and showed multiple, larger well-defined opacities in the left breast compared to the right breast and bilateral silicone prostheses. As US and MG examinations had limited sensitivity, the patient was redirected to MRI. Axial T1-weighted TSE (TR/TE=516/80 msec), axial fat saturated T2-weighted TSE (TR/TE=6700/120 msec) showed retroglandular fluid collections of water signals, hypointense on T1-weighted, hyperintense on T2-weighted images with migration of gel out of the injection site. Contrast-enhanced 3D gradient echo T1-weighted dynamic sequence (TR/TE=50000/2500 msec) revealed marked rim enhancement around the collection, located in the left breast. In an axial silicone sequence (TR/TE=7800/70) bilateral hyperintense retropectoral silicone prostheses were detected.

Discussion:

The PAAG is non-resorbable soft tissue filler, which is used as implant material for breast augmentation particularly in China [1]. In the published literature, many complications were reported related with hydrogel [1]. Some of them are inflammation, persistent mastodynia, formation of multiple lumps, poor cosmetic results, glandular atrophy, and significant spread of hydrogel into the surrounding tissue [1, 2]. The clinical features and symptoms are obviously important, during management of complications after PAAG injection. Radiologic evaluations are essential in evaluation and diagnosis [3]. The MG appearance is non-specific. Nevertheless, dense tissue density and markedly enlarged breast tissue can be
demonstrated [1, 3]. The US is a useful diagnostic tool for PAAG complications. It can be used to demonstrate the site of complications. The honeycomb appearance may be related with fibrosis, in the local inflammation [4]. Additionally, fluid collections with heterogeneous echogenicity can be identified. A sharp border between normal glandular tissue and the collection may also be identified [1]. The injected PAAG is appeared as a homogenous hypoechoic layer, in the absence of complications [4]. The MRI can show the exact position of the injected gel. Fluid collections are hypointense on T1-weighted images and hyperintense on T2-weighted images in patients without any complications. However, T1-weighted images are slightly higher and T2-weighted images are slightly lower, in patients with inflammation [1]. Contrast medium enhancement can allow delineation of the complicated site. The marked rim enhancement of the collection can be showed after contrast administration [1, 4]. Additionally, extravasation of the gel is better seen on MRI examinations than other imaging modalities [1].

An infection may occur, in late time of injection. It can be related with decreased immune response. The patient may be at increased risk of superimposed infections, in lactation period [1]. In these patients, histologic examination of the collections can reveal inflammatory cells and granular debris. The intracollection inflammation can be possible after PAAG injection large fluid collections, notably in women with breastfeeding [4].

It is important to be familiar with the radiological appearance of complicated and non-complicated cases with injection mammoplasty with PAAG. Radiological evaluation, especially US and MRI examinations are useful in demonstrating the extension and involvement of complications.

**Differential Diagnosis List:** Local inflammation and extravasation in the injection site of hydrophilic polyacrylamide gel, Abscess, Haematoma, Galactocele, Necrotic malignant tumour

**Final Diagnosis:** Local inflammation and extravasation in the injection site of hydrophilic polyacrylamide gel

**References:**


Description: In US images, there are well defined, multiple, hypoechoic, heterogeneous collections with different measurements (Thick arrows). The collections in her left breast were more heterogeneous with honeycomb appearance (Thin arrows). Origin: Balci, P, Department of Radiology, Dokuz Eylul University, School of Medicine, Izmir, Turkey
Figure 2

Description: MG images reveal multiple, well defined opacities which were larger on her left breast and silicon prostheses at the posterior parts of her both breasts. Origin: Balci P, Department of Radiology, Dokuz Eylul University School of Medicine, Izmir, Turkey
Description: MRI images reveal water signals, hypointense on T1, hyperintense on T2-weighted images. Additionally there is migration of gel out of injection site. In the last image retropectoral silicone protheses are hyperintens, collections are hypointese. Origin: Balci P, Department of Radiology, Dokuz Eylul University School of Medicine, Izmir, Turkey