Incidentally breast findings on a thoracic CT study - what should we look for?

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Learning objectives

To review and illustrate the imaging findings of incidentally breast conditions on thoracic Computed Tomography (CT) studies, including manifestations/complications related to breast treatment.
Background

During the last years the use of CT imaging techniques suffered an incredible rising for diagnostic and screening purposes. In the thoracic area the CT studies are mainly use to assess pathologic conditions in the lung, pleura, mediastinum, chest wall and diaphragm. As a result of improved spatial and temporal resolution of the technique, breast pathology can be identified more times as incidentally findings, than they were before.

Although conventional mammography and sonography of the breast are the main imaging techniques used for breast screening, thoracic CT studies performed for other reasons can detect and characterize breast lesions and in some cases suggest a diagnosis or propose additional work-up.
The entire breast tissue is covered in a thoracic CT scan and although breast pathology is usually overlooked or misinterpreted with CT, there are several occult breast conditions that can be incidentally found during a thoracic CT examination. Radiologists should always include the breast in their CT interpretation and even though CT breast findings are frequently non-specific, they should be referred for further assessment and management.

New breast lesions picked up incidentally on routine thoracic CT include breast masses, calcifications and calcified masses, fat containing lesions, changes in tissues density, skin thickening and nipple retraction. The radiologist should be able to detect and characterize them - size, location, shape, margins, density, other findings - still, most of the times, an additional breast study will be necessary.

Because breast cancer is one of the most common cancers in women and CT is sometimes the first imaging study to detect breast cancer, radiologists should also be familiar with the CT appearance of this pathology.

We divide this paper in two sections:

1. on the first section we will describe the most common incidentally breast findings on a thoracic CT study
2. on the second section we will describe some particular findings in breasts previously subjected to medical or surgical treatments.

1. Common breast findings on a thoracic CT study

1.1 Breast masses

Large breast masses are frequently seen in thoracic CT studies. In dense fibroglandular backgrounds, lesions can be obscured as occurs with mammography. Although additional mammography and/or breast ultrasound should be suggested when a breast lesion is first recognized on a thoracic CT, some imaging features may help to predict the behavior of the lesion. These features includes: lesion morphology and borders; the number of lesions; findings suggesting invasion of the surrounding structures or metastatic disease; and the enhancement pattern.

An irregular shaped, ill-defined dense mass with irregular, indistinct, obscured, microlobulated or spiculated borders are predictive of the presence of malignancy (figures 1-3) Fig. 1 on page 13 Fig. 2 on page 13 Fig. 3 on page 14. It is important to be aware that typically benign findings as a round, well-defined mass can also be malignant. Sometimes central necrosis may be present and suggests a malignant mass (figure 4) Fig. 4 on page 15.
Masses with internal septations may also be malignant and this is particularly suspicious when the septations enhance with intravenous contrast agent.

**Malignant breast lesions** may invade surrounding tissues such as the chest wall, and the skin (figure 5) Fig. 5 on page 16. Sometimes a contralateral tumor may be visible. Signs of metastatic disease also suggest a malignant behavior (figure 6) Fig. 6 on page 17.

Bilateral or multifocal suspicious lesions are normally associated with invasive lobular carcinoma or breast metastases. Metastases to the breast are rare, usually round shaped, well-circumscribed masses and can occur from breast cancer, lymphoma, leukemia, melanoma, lung and renal cell carcinoma and mesothelioma (figures 7-8) Fig. 7 on page 18 Fig. 8 on page 19.

**Benign imaging features** includes: circumscribed, well-defined, oval/round/lobular lesions with regular or smooth margins (figures 9-11) Fig. 9 on page 20 Fig. 10 on page 21 Fig. 11 on page 22. However, the benign nature of a lesion with CT must always have a confirmation with mammography plus/or breast ultrasound. Fluid density suggests a likely benign lesion.

A mass that is stable in morphology and dimension in comparison with prior chest CT is probably a **benign lesion** (figure 12) Fig. 12 on page 23.

Several studies have shown that **malignant lesions** enhance significantly more than benign ones, particularly in the early arterial phase, and that peripheral enhancement is a feature of malignancy but this is beyond the purpose of our paper. Time-density curves, similar to enhancement curves obtained with breast MR can also be applied to CT - the washout and plateau patterns are predictive of malignancy.

### 1.2 Calcifications and calcified masses

Calcifications are frequent findings in the breast. Microcalcifications (smaller than 0.5 mm), more probably malignant, are usually very tiny to be seen with a thoracic CT due to the limited spatial resolution.

Only larger, dense breast calcifications can be seen in CT studies and they are almost always associated with benign changes. These can be associated with a mass or can be isolated and are defined by their morphology and characteristics as:

- **Large rodlike calcifications** - dense linear calcifications oriented along the breast within ectatic ducts that point to the nipple; are associated with **plasma cell mastitis** (figure 13) Fig. 13 on page 24. Plasma cell mastitis is a benign peri or intraductal inflammation of the breast and is frequently bilateral. Plasma cell mastitis is often seen in old women.
• **Eggshell/ rim calcifications** - round or oval with peripheral calcifications. This type of calcification is associated with **oil cysts, fat necrosis** and **calcified old hematomas** (figure 14) Fig. 14 on page 25. Calcifications from foreign bodies such as **silicone injections** can also present as eggshell type appearance. Fibrous silicone breast masses resulting from liquid silicone breast augmentation injection can also present as rounded masses, with well-defined borders and peripheral calcifications. They can also present with spiculated margins, being difficult to differ from breast malignancy.

• **Coarse, "popcorn-like" calcifications** - these calcifications are usually related to **calcifying involuting fibroadenomas** (figure 15) Fig. 15 on page 26. Fibroadenomas are solid benign oval and circumscribed masses that can calcify. They may be multiple and bilateral. If the calcification and mass shape are not characteristic, additional studies may be necessary; otherwise a classic appearance should be left alone.

• **Round calcifications** - these calcifications can occur in **dermal calcifications** and are superficial, close to skin.

• **Parallel calcified lines** - represent calcification in the arterial wall due to atherosclerosis - **vascular calcifications** (figure 16) Fig. 16 on page 27.

• **Dystrophic calcifications** - commonly associated with previous **breast biopsy, surgery, radiation therapy** or **trauma**. Dystrophic calcifications are linear, amorphous and sometimes have a bizarre shape. They can be associated with fat necrosis and develop 2 years after surgery or radiation therapy.

Even though nearly all breast calcifications are benign, when associated with a mass other than a classic fibroadenoma, additional work-up is necessary because, in rare cases, a malignant lesion can be present.

### 1.3 Fat containing lesions

Fat lesions in the breast include lipoma, liposarcoma, fibroadenolipoma, lymph nodes, oil cyst and fat necrosis.

**Lipoma** is a soft well-circumscribed fatty mass, with an oval or round shape. **Liposarcoma** is an extremely rare malignancy that may occur in the breast; it manifests usually as a fat containing lesion that demonstrates a rapid growing.

**Fibroadenolipoma** also known as hamartoma consists of fat and glandular breast tissue ("breast within a breast"). Usually they can be seen on CT as a well defined (oval or round) encapsulated mass with dense fibroglandular tissue and macroscopic fat.

**Fat necrosis** is common after a breast biopsy, blunt trauma or surgery and is the result of saponification of fat. It manifests as a lipid-filled mass with low (fat) density and is usually associated with dystrophic calcifications. Calcified eggshell-type rims around a fat attenuation center are a common imaging finding of fat necrosis (figures 14 and 17).
Lymph nodes are typically present in the axilla but can also be seen in the breast, particularly in the upper outer quadrant (intramammary lymph node). They present as round or oval well-circumscribed solid masses with a low-attenuation fatty center (hilum).

1.4 Changes in density

An asymmetric soft-tissue density is an indeterminate feature on a CT study although it may be related to invasive cancer, more frequently lobular carcinoma. So, in the presence of an asymmetric soft-tissue density, additional assessment is necessary.

Breast edema can also present as a change in the density of the breast and can be associated with inflammatory and neoplastic conditions (figure 18) Fig. 18 on page 29.

Tissue thickening can sometimes be present in fibrocystic disease.

Gynecomastia is a common abnormality in the male breast, particularly in old and obese men, and may present as a change in the density of the subareolar region and can be uni or bilateral, symmetric or asymmetric (figure 19) Fig. 19 on page 29. It represents an abnormal proliferation of benign ducts and stroma hyperplasia without encapsulation. Causes of gynecomastia include high serum estrogen levels from endogenous or exogenous sources, low serum testosterone levels, endocrine and systemic disorders (chronic renal failure, cirrhosis, hyper and hypothyroidism), drugs (spironolactone, digitalis, sertraline, marijuana), tumors (lung, adrenal, testicular, hepatoma) or may be idiopathic.

1.5 Skin thickening and nipple retraction

Skin thickening and nipple retraction are frequently associated with malignant tumors (figures 20-21) Fig. 20 on page 30 Fig. 21 on page 31.

Marked skin thickening and nipple retraction can be seen with inflammatory carcinoma or mastitis/abscess formation. Sometimes an irregular solid mass or a complex fluid density lesion with thick septations can be associated with these findings in inflammatory carcinoma.

Usually additional work up is necessary, including skin breast biopsy, if skin thickening is the only finding.

2. CT findings of breasts previously subjected to treatments or surgery
Breast surgery can result from benign and malignant conditions; nevertheless the main indication is breast cancer. Uni or bilateral breast reduction surgeries may also be done for cosmetic purposes.

Radiation therapy is frequently used in the common breast cancer to decrease tumor volume and to reduce the risk of locoregional recurrence when a breast conserving surgery is performed.

After treatment (medical or surgical), breast changes occur and can be seen on a thoracic CT study; the radiologist should be familiar with the imaging appearance. Some changes that occur can simulate a malignant condition. However, a malignant pathology will grow and change over time while a postoperative/ postradiation change will remain stable or even improve over time.

2.1 Postradiation

In the immediate postradiation therapy period the breast becomes edematous and diffuse soft tissue attenuation and skin thickening can be seen on CT studies. These findings can persist for several years.

2.2 Breast surgery

Surgical treatment of breast cancer is used to obtain the cure. There are several surgical approaches depending on the characteristics of the tumor: **radical mastectomy**, **modified radical mastectomy** and **breast-conserving surgery (lumpectomy)**.

**Radical mastectomy** consists in removing the breast and the pectoralis muscles. Regional lymph nodes along the axillary vein are also removed.

In **modified radical mastectomy** the breast and the axillary lymph nodes are removed and the pectoralis major muscle is preserved (figures 22-23) Fig. 22 on page 31 Fig. 23 on page 32 . This technique is the most used these days and includes two subtypes: the Patey and the Auchincloss procedures. In the former although the pectoralis major muscle is intact and in its place, the pectoralis minor muscle and the apical nodes in the axilla are removed. With this procedure there is a risk of injury of the lateral pectoral nerve, with secondary atrophy of the pectoralis major. In the Patey procedure modified by Scanlon, pectoralis minor muscle is divided but not removed. On the other side, with Auchincloss procedure, the pectoralis minor muscle and apical axillary nodes are preserved.

Excision of the breast tumor and surrounding breast tissue is called **breast-conserving surgery or lumpectomy**. This technique is usually followed by whole breast irradiation. Lumpectomy is used when the breast cancer is small and a good cosmetic can be obtained.
In breast-conserving surgery, axillary lymph nodes removal will depend on the histology of the primary tumor. Sentinel lymph node dissection is a popular alternative to axillary lymph nodes dissection.

2.3 Breast reconstruction and implants

Breast reconstruction after mastectomy can be done using implants, autologous tissue or a combination of the two. Sometimes reduction mammoplasty is required on the contralateral breast in order to obtain symmetry.

Implants are also used for cosmetic breast augmentation, usually bilateral, on otherwise normal breasts.

Breast prosthesis implantation requires placement of a tissue expander preceding it to expand the skin. Then, a new surgery is performed and the tissue expander is removed and a permanent implant is placed beneath the pectoralis muscle and laterally beneath the anterior aspect of the anterior serratus muscle. The implants can be filled with silicone gel or be saline-filled and are positioned either deep to the glandular tissue (retroglandular) or deep to the pectoralis major muscle (retropectoral) (figure 24) Fig. 24 on page 33. Fibrous tissue usually develops around the implant.

Variable breast prostheses are available today and are categorized by lumen number and filler contour.

Implant complications, including silicone granuloma formation, capsular contracture and implant rupture are not adequately evaluated with TC. Nevertheless irregular capsular contour, thickening of the fibrous capsule, change of the shape of the prosthesis (infolding, tenting, irregularity), periimplant calcifications and the presence of fluid collections around the implant can be signs of complications and additional imaging techniques, including breast magnetic resonance, should be recommended (figure 25) Fig. 25 on page 34.

The autologous tissue reconstruction techniques includes:

- The transverse rectus abdominis musculocutaneous (TRAM) flap procedure
- The latissimus dorsi myocutaneous flap procedure

TRAM flap technique consists in transposition of a portion of the abdominal wall, including subcutaneous fat and all or part of one of both rectus abdominis muscle with attachments to vascular structures, to the chest, as a pedicle or free flap. It is the most popular technique for autologous or natural-tissue breast reconstruction.

The CT findings of a TRAM flap are similar to those of normal breast with a more accentuated homogeneous central fat density (comparing to irregular soft-tissue density
of the normal glandular elements mixed with fat in native breast) and a similar shape to the native breast (figure 26) Fig. 26 on page 35. The de-epithelialized skin from the abdominal wall can look like thin (1-3 mm), curvilinear or parallel soft-tissue bands deep to the skin surface. Thick (more than 3 mm) soft-tissue bands can also be seen especially within a month of the surgery. However if the thickening persists or develops, inflammation, infection and local cancer recurrence should be thought. Surgical clips in the chest wall may be sometimes present.

Superficial and deep to these soft-tissue bands there is fat density, the former corresponding to the adipose tissue of the thoracic wall and the latter to the adipose tissue of the abdominal wall.

Additionally the rectus abdominis muscle should be absent in the abdominal CT (figure 26) Fig. 26 on page 35.

In latissimus dorsi myocutaneous flap technique, the latissimus dorsi muscle and the overlying skin are removed and transferred for the breast. An implant must be placed beneath the flap for adequate bulk for the breast reconstruction.

2.4 Complications related to treatment

2.4.1 Hematoma and seroma

Breast hematomas and seromas can occur after a surgery, trauma or biopsy. It is important to be aware of this history to make a proper interpretation of the finding. They usually reduce their size over time. In rare cases they may persist and require aspiration.

Seroma represents the most usually seen complication and appears as a serous fluid collection in the breast, anterior chest wall or axilla (figure 27) Fig. 27 on page 36.

A hematoma/seroma can present as an irregular or well-defined fluid collection with enhancing walls. Hematoma usually presents with elevated density (40-50 HU), while seroma appears as a fluid attenuation collection (less than 10 HU) on CT, but sometimes accurate differentiation between these two collections is not possible on image studies (figure 27-28) Fig. 27 on page 36 Fig. 28 on page 37. Calcifications, septations, air-fluid levels and surgical clips may be present.

Edema of the breast is also common after the previous referred procedures and manifests as diffuse density (figure 28) Fig. 28 on page 37.

2.4.2 Infection and abscess

After breast reconstruction, the skin flaps can infect as a consequence of axillary nodes removal with compromise of the lymphatic drainage. Staphylococcus aureus and
*Staphylococcus epidermidis* are the responsible pathogens for cellulitis that manifests as diffuse linear strands of soft tissue.

**Breast abscess** is a rare surgery-related complication. The CT appearance of a breast abscess is similar to that described for hematomas and seromas - a low attenuation fluid collection, but usually presents with thick walls that suffer rim-enhancement after contrast administration (figure 27) Fig. 27 on page 36. Air-fluid levels may be present and air is unusual. The tissue that surrounds the abscess may show enhancement due to inflammation. A history of fever, elevated white blood cell count, painful hard mass and red edematous skin should raise suspicion of an abscess.

Breast abscess may also occur in women without previous surgery in a mastitis context, which in particularly common in nursing mothers, diabetic or immunocompromised women.

### 2.5 Postoperative fibrous scar

**Postoperative fibrous scar** presents on thoracic CT scans as a spiculated dense mass that mimics cancer. Surgical clips, skin thickening and retraction may be present in the surroundings (figure 29) Fig. 29 on page 38. As the fibrous scar characteristics are those of a malignant lesion, it should be differentiated from cancer. The scar is not of concern if it corresponds to the surgical site.

Postbiopsy scars can also have a spiculated masslike appearance. In the immediate post procedure period air and fluid can be present.

A history of previous surgery/biopsy should always be present when suspecting a postoperative fibrous scar and review older studies is mandatory to confirm stability. If a new mass develops at the postoperative scar of previous cancer resection a tumor recurrence should be suspected.

### 2.6 Tumor recurrence

Local and regional recurrence can be easily seen with CT and this technique is also widely used in patients with breast cancer in order to monitoring response to treatment of metastatic disease.

The tumors that reappears at the site of previous surgery - **local recurrence** - may present on CT as a dense irregular density/mass of soft-tissue attenuation in the subcutaneous fat, focal skin thickening or a new lesion in the muscles of the chest wall (figures 30-31) Fig. 30 on page 39 Fig. 31 on page 40.

In reconstructed breast, if a new soft-tissue mass in present, recurrent breast cancer should also be suspected.
Contralateral recurrence can also occur and should not be overlooked.

Metastases that appear in the lymph nodes of the axilla, mammary and supra-clavicular chains are called regional recurrence. Regional recurrence is more common in patients with previous large tumors, multiple lesions, positive margins and positive lymph nodes at the time of cancer diagnosis.
Images for this section:

Fig. 1: Axial (A) contrast-enhanced CT scan shows a spiculated, dense and ill-defined mass in the left breast (arrow) that was proved to be an invasive ductal carcinoma. Ultrasound (US) of the lesion (B) detected in the CT study reveals an irregular hypoechoic shadowing mass (arrow).

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Fig. 2: Axial contrast-enhanced CT scan shows an irregular mass lesion with heterogeneous enhancement in the right breast (arrow in A) that was proved to be a invasive micropapilar carcinoma. Contrast-enhanced CT scans show an ill-defined dense mass with irregular margins in the left breast (arrow in B) and lymphadenopathy in the axilla (arrow in C) - invasive ductal carcinoma was the diagnosis after biopsy.

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Fig. 3: Axial contrast-enhanced CT scan (A) shows an ill-defined mass in the left breast with microlobulated borders (arrow). An ultrasound (B) obtained to better characterize the lesion incidentally found in the thoracic CT reveals a microlobulated hypoechoic mass, suggestive of cancer. Mediolateral oblique (C) and craniocaudal (D) mammograms of the left breast show a high-density ill-defined mass with indistinct margins in the upper outer quadrant of the left breast (arrow). Biopsy demonstrated an invasive ductal carcinoma.

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Fig. 4: Contrast-enhanced CT scan (A) shows an irregular, partly enhancing lesion (arrow) with a hypodense central area (suggesting necrosis), suspicious for malignancy. US image shows a complex lesion with cystic areas and microlobulated borders (B).

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Fig. 5: Contrast-enhanced CT scans show a huge mass with massive skin thickening and nipple retraction involving the left breast and suggesting diffuse infiltrative disease (arrows). Extension to the chest wall and a left pleural effusion are also present.

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Fig. 6: Axial nonenhanced CT scan (A) shows a spiculated irregular mass (arrow) in the left breast. US image (B) shows the hypoechoic, spiculated cancer with an echogenic halo (arrow). Axial nonenhanced CT scans (C-D), with bone window, reveal multiple lytic bone lesions in both iliac bones (arrow in C) and ribs (arrow in D).

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Fig. 7: Axial contrast-enhanced CT scan shows an ill-defined mass in the upper outer quadrant of the right breast (arrow). Biopsy revealed metastatic lung cancer.

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**Fig. 8:** Contrast-enhanced CT scan shows a well-defined solid mass with regular borders (arrow) in the inner quadrants of the right breast (A). Abdominal scan (B) shows extensive paraaortic nodes (*) in a patient with B cell lymphoma.

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Fig. 9: Contrast-enhanced CT scan (A) shows an oval, well-defined, homogenously enhancing mass (arrow) in the upper outer quadrant of the left breast. US image (B) shows a solid, lobulated, parallel, hypoechoic mass that was proved to be a fibroadenoma.

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Fig. 10: Axial nonenhanced CT scan (A) shows a round mass with regular borders (arrow) in the lower right breast. US image (B) shows a solid, lobulated, parallel, hypoechoic mass that was proved to be a fibroadenoma.

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Fig. 11: Axial contrast-enhanced CT scan (A) shows an elliptical, well-defined mass (arrow) in the upper inner quadrant of the right breast. Mediolateral oblique (B) and craniocaudal (C) mammograms of the right breast show the circumscribed, regular, noncalcified mass (arrows) in the upper inner quadrant. US image (D) shows the solid, parallel, well-defined, hypoechoic mass. This mass was submitted to biopsy that revealed a fibroadenoma.
Fig. 12: Axial contrast-enhanced CT scans show an elliptical, well-defined, homogeneously enhancing mass in the upper outer quadrant of the right breast (arrows). The characteristics of the mass are benign. A previous CT scan obtained the year before (B) demonstrated stability of the lesion comparing to the most recent CT study (A), suggesting a benign lesion.

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Fig. 13: Axial contrast-enhanced CT scan (A) shows several dense linear calcifications in the left breast (arrow). Craniocaudal mammogram (B) of the left breast, previously obtained in the same patient, demonstrates rodlike calcifications in a ductal distribution and pointing to the nipple, confirming the diagnosis of plasma cell mastitis.

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**Fig. 14:** Axial nonenhanced CT scan shows a mass with peripheral calcifications in the left breast (arrow) in a postoperative scar in a patient previous submitted to lumpectomy, findings that suggest fat necrosis.

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**Fig. 15:** Axial contrast-enhanced CT scans show multiple, bilateral, coarse "popcorn-like" calcifications within well-defined masses (arrows), suggesting calcifying involuting fibroadenomas.

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**Fig. 16:** Axial nonenhanced CT scan (A) shows parallel calcified lines in the left breast (arrow). Mediolateral oblique (B) and craniocaudal (C) mammograms of the left breast show dense parallel calcifications along arterial walls (arrows). Note the spiculated mass (*) in the upper outer quadrant of the left breast that proved to be a cancer.

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Fig. 17: Axial contrast-enhanced CT scan shows a mass with central fat density and peripheral calcifications (arrow) consistent with fat necrosis in a patient with a left TRAM reconstruction.

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Fig. 18: Axial nonenhanced CT scan shows an irregular mass (arrow) in the left breast consistent with a malignant lesion. There are also density changes involving the mass (*).

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Fig. 19: Axial contrast-enhanced CT scan shows symmetric soft-tissue density in both subareolar regions in a male patient, consistent with gynecomastia.

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**Fig. 20:** Axial contrast-enhanced CT scan (A) shows a lobulated mass (*) in the right breast associated with skin thickening (arrow) suggestive of malignancy. US image (B) shows a suspicious mass with ill-defined borders and complex internal features (*). An invasive ductal carcinoma was the final diagnosis, after biopsy.

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**Fig. 21:** Axial contrast-enhanced CT scan (A) shows a well-defined round lesion (arrow) in the left subareolar region associated with nipple retraction and skin thickening, features that suggest a malignant lesion. US image (B) shows an oval lesion with complex hypoechoic internal characteristics.

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**Fig. 22:** Axial contrast-enhanced CT scan shows skin thickening (arrow) in a patient previously subjected to right mastectomy.

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**Fig. 23:** Axial nonenhanced CT scan shows a left modified radical mastectomy.

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Fig. 24: Axial nonenhanced CT scan shows bilateral retroglandular breast implants.

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Fig. 25: Axial contrast-enhanced CT scans (A, B) show a right retropectoral breast implant. The capsular contour was irregular and a breast MR was performed. Axial MR (C-D) did not show signs of intra or extracapsular rupture.

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Fig. 26: Axial contrast-enhanced CT scans (A, B) show a TRAM reconstruction of the left breast (*) and absence of the right rectus muscle (arrow).

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**Fig. 27:** Axial contrast-enhanced CT scans show a postoperative seroma (arrows) in the right (A) and left breasts (B) in different patients previously submitted to modified radical mastectomy.

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Fig. 28: Axial contrast-enhanced CT scan (A) shows a dense collection - hematoma (arrow) - in a woman who had undergone mastectomy. Note also the soft-tissue density (*) surrounding the postoperative hematoma compatible with edematous changes. US image (B) of the same patient shows the septated fluid collection (*).

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Fig. 29: Axial contrast-enhanced CT scan shows a spiculated dense mass (arrow) in a woman previously subjected to right mastectomy. Comparison with old examinations revealed stability, findings consistent with a postoperative scar.

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**Fig. 30:** Axial contrast-enhanced CT scan shows a round dense mass (arrow) in a woman previously subject to right mastectomy. Local recurrence was proved posteriorly.

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**Fig. 31:** Axial contrast-enhanced CT scan shows a lobulated solid mass (arrow) in a woman submitted to modified radical mastectomy of the right breast. It was proved to be a local recurrence of an invasive ductal carcinoma.

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Conclusion

Breast should always be reviewed in thoracic CT, as abnormalities are sometimes found. Knowing the most important features of breast conditions on CT studies allows the radiologist to adequately report them, contributing to the proper management of the patient.
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