



INFLAMMATORY BREAST CANCER

Inflammatory breast cancer (IBC) is a rare subtype of breast cancer that accounts for 2–5% of all breast cancers. It has a highly virulent course with a low 5-year survival rate of 25–50%. Standard treatment with preoperative chemotherapy, mastectomy, and radiation therapy has been shown to improve prognosis.

IBC usually presents with rapid onset of clinical signs that develop within 3 months which include breast erythema and edema, often with no palpable mass, and may involve one-third or more of the breast (Fig 1). Peau d'orange (french for “orange skin”) may also be present where the skin is pitted and dimpled due to the presence of tumor emboli that obstruct the dermal lymphatics (Fig 2). The breast may be enlarged, warm, and tender. These symptoms may mimic inflammation, however there is no true inflammatory component to IBC. 20–40% of patients will already have distant metastases, which reflects the very aggressive nature of IBC.

The major differential diagnosis for IBC is breast infection (mastitis) with or without an abscess. Mastitis often manifests as



Figure 1: Breast erythema and oedema are seen in IBC, however there is no palpable mass



Figure 2: Peau d'orange appearance of the skin in IBC

cutaneous erythema, edema with skin thickening and fever. If a focal lump or skin fluctuance is seen, ultrasonography (US) will determine whether an abscess is present (Fig 3) and would also guide percutaneous drainage. Antibiotic treatment should result in complete resolution of the infection. If there is no response

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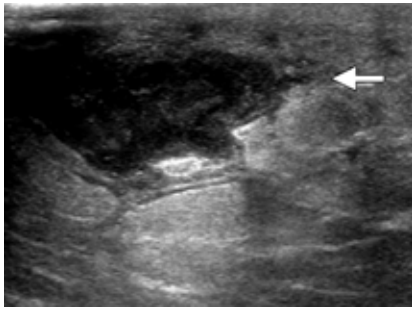


Figure 3: Breast abscess appearing as a hypoechoic area on ultrasound with ill-defined margins; needle aspiration obtained pus from this area, which helped diminish bacterial load and also provided a sample for bacterial culture and sensitivity studies

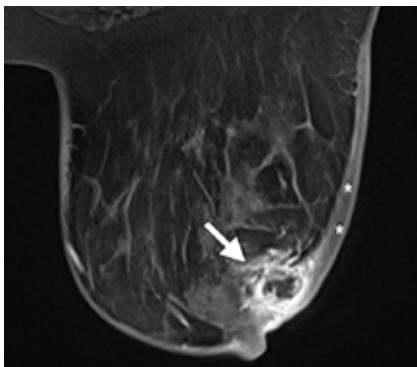


Figure 4: Breast MRI showing a breast abscess with rim enhancement (arrow) and adjacent skin thickening (*)

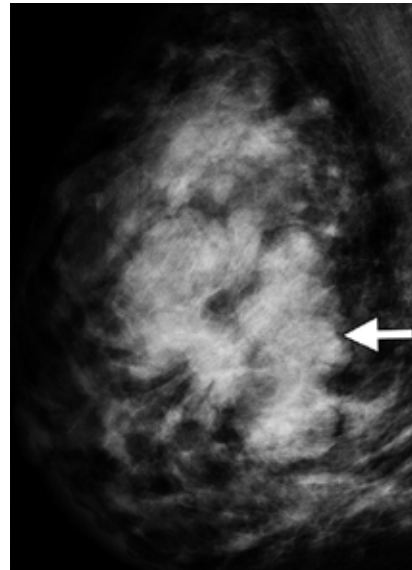


Figure 5: Mammogram showing a 7cm mass (arrow) in the upper inner breast

or an incomplete response to antibiotic treatment within 1–2 weeks, malignancy such as IBC should be considered. Breast abscess formation presents as a ring enhancing lesion on MRI with adjacent skin thickening (Fig 4).

Locally advanced breast cancer (LABC) may also present with a similar clinical picture, however the onset of IBC occurs within a short period (usually 3 months) whereas that of LABC is more protracted. Erythema and skin induration (and peau d'orange) are less common, but may be present if skin infiltration by tumor cells occurs. Mammography of LABC will show a large mass (Fig 5) that may have been present clinically for a long time, while ultrasound shows a solid hypoechoic mass (Fig 6). Attempts at aspiration show no pus or fluid and histologic diagnosis is established by US-guided core biopsy. Skin punch biopsy is utilized to confirm cancerous infiltration of the skin, which is a feature of IBC.

LABC occurs in an older age group and has a better prognosis than IBC since it is less aggressive and grows more slowly. In LABC, the incidence of distant metastases is lower (10% in LABC vs 20-40% in IBC) and its genetic subtypes are more likely to respond to therapy; LABC is more likely to be

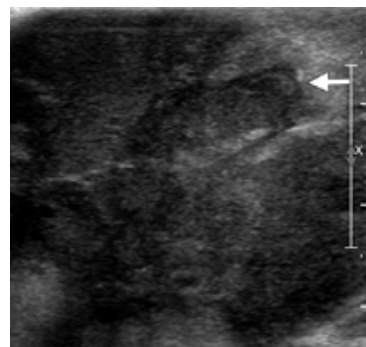


Figure 6: US image shows a 7cm hypoechoic mass which on US-guided core biopsy demonstrated high-grade invasive ductal carcinoma



Figure 7: More common mammographic presentation of IBC with diffuse breast enlargement, diffuse increased density (arrowhead), skin thickening (black arrow), and enlarged axillary lymph nodes (white arrow)

oestrogen-receptor (ER) positive and less likely to be HER2 negative, while IBC has a high incidence of triple-negative cancers (50%) and is more frequently HER2 positive (40%). Functioning tumor suppressor gene (p53 gene) is lower in IBC and multiple genetic factors that stimulate tumor growth are more likely to be present.

In the imaging workup of IBC, mammography is usually the initial study that shows diffuse enlargement of the breast with diffusely increased density, skin thickening and possibly

enlarged lymph nodes (Fig 7). A less common mammographic presentation of IBC is that of multiple masses (Fig 8). US can help differentiate a benign cystic mass from a solid mass and can evaluate a solid mass according to its margins (smooth, irregular, or speculated), its size and extent (Fig 9).

If no mass lesion is detected on mammography or US, Magnetic Resonance Imaging (MRI) may be used to target biopsy as it has been shown to be the most accurate imaging technique for detection of the primary breast lesion in patients with IBC (Fig 10). The primary breast lesion is detected at mammography in 68–80% of cases, at US in 94–95% of cases, and at MRI imaging in 98–100% of cases. The more common

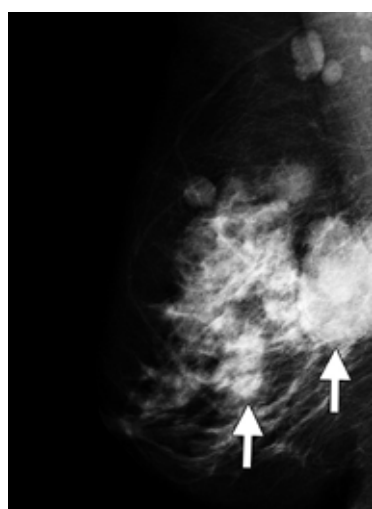


Figure 8: Less commonly IBC may present with multiple large masses (arrows) on mammography

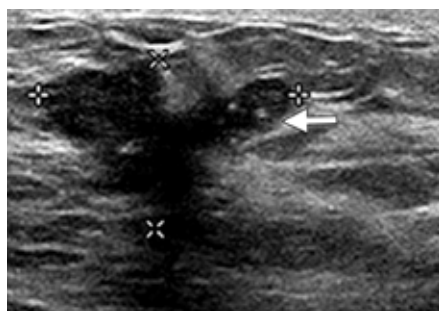


Figure 9: US image of IBC shows a 2.7cm, irregular, hypoechoic mass with posterior shadowing

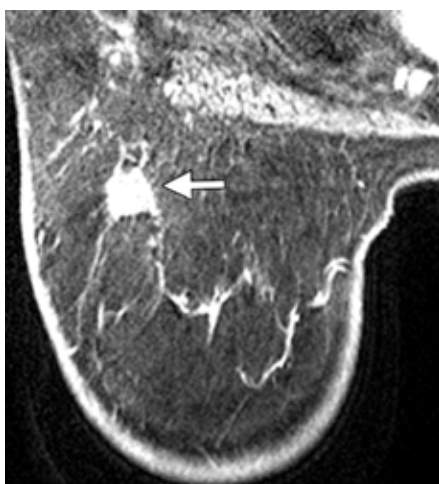


Figure 10: MR shows primary breast lesion in a patient with IBC, who had no detectable lesion on mammography and initial ultrasound

appearance of IBC on MRI is however as a diffuse contrast enhancing area involving a large part of the breast, with skin thickening (Fig 11); presentation as a mass-lesion is less common on MRI. Involvement of the pectoralis major muscle and axillary, supraclavicular and internal mammary lymph nodes as well as the contra-lateral breast are common in IBC and are also best assessed with MRI. Evaluation for distant metastatic disease from IBC would require Computed Tomography (CT), MRI or [18F]-fluorodeoxyglucose (FDG) Positron Emission Tomography-Computed Tomography (FDG PET/CT).

Follow-up imaging during and after treatment may include mammography, US and MRI. Dynamic contrast-enhanced MRI kinetics are particularly useful for detecting tumor response (Fig 12).

Imaging is vital for the diagnosis and treatment planning for patients with IBC. The role of various imaging modalities in diagnosis, assessment of treatment response, and surveillance has been presented here. ❄️

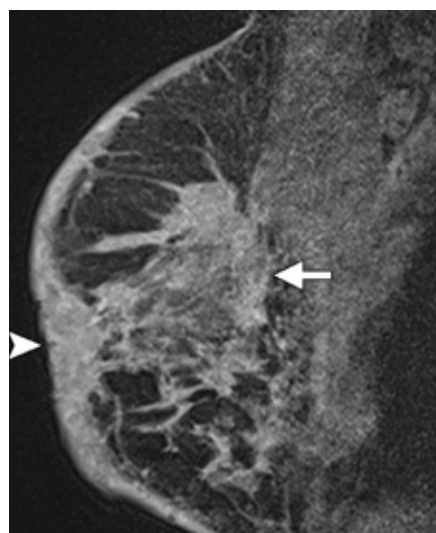


Figure 11: Most common MR presentation of IBC includes extensive non-mass-like enhancement (arrow) and skin thickening (arrowhead)

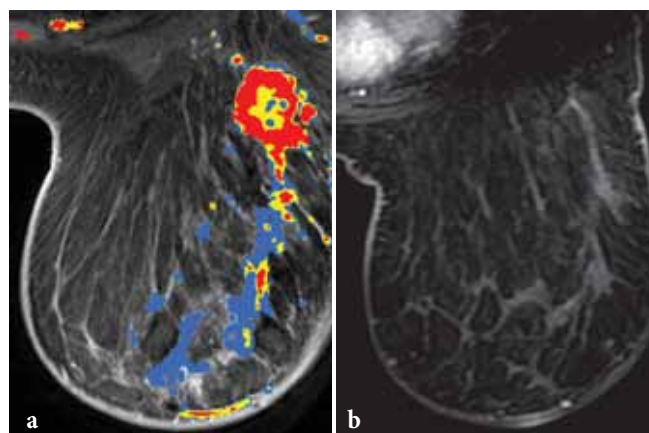


Figure 12: Dynamic contrast-enhanced MR kinetic studies: (a) Before treatment, areas of washout (red) and plateau or persistent enhancement (blue) are seen; washout kinetics are strongly indicative of cancer, while persistent or plateau kinetics are equivocal, (b) After treatment, there is no contrast enhancement, indicating complete response