

BREAST IMAGING SOCIETY, INDIA

BEST PRACTICE GUIDELINES

COMMON BREAST SYMPTOMS: ALGORITHM FOR IMAGING EVALUATION

Common breast symptoms include breast lump, pain, nipple discharge, inflammation; either alone or in combination. Breast imaging performed in this group of patients is called diagnostic breast imaging.

Purpose of clinical and imaging evaluation is to determine the cause of symptoms so that appropriate treatment can be given and secondly, to determine if the symptom is caused by underlying breast cancer. Accordingly evaluation of patient with any breast symptom should begin with detailed history and good clinical breast examination (CBE), preferably by a breast surgeon. This is to be followed by appropriate imaging as outlined below. Following a reporting system such as the ACR BI-RADS system is advised.[1]

BREAST LUMP

Breast lump is the most common breast symptom. Although most breast lumps are benign, it is also the most worrisome complaint as it is the most common presentation of a breast cancer.

All patients presenting with breast lump should undergo Triple assessment.[2] It is a combination of clinical breast examination, imaging test and pathology test, ideally core biopsy. It is a standard and accurate method to diagnose breast cancer in symptomatic breast.[3] However, if the correlate of the breast lump is clearly benign on imaging, biopsy may be avoided.[4]

Imaging modality: Upto 30 years of age ultrasound of both breasts is the primary modality. Mammogram in this age group is performed only if there is strong clinical suspicion of breast cancer or if suspicious finding is detected on ultrasound.[4] If age is more than 30 years, then both mammography and ultrasound of both breasts are recommended.[4] In the 30 – 40 years age group clinical correlation is advised before requesting / performing a

mammogram. For example a 32 year old lady who presents with a lump that she can feel but on clinical palpation by the doctor is interpreted as normal nodular feel of breast, with a normal ultrasound may not require a mammogram for further characterization of the lump.

Dynamic Contrast Enhanced Magnetic Resonance Imaging (CE-MRI) of breast is considered only if ultrasound and mammogram are inconclusive. If mass is identified on ultrasound and mammography, MRI is not recommended for its further characterization.

Further management is according to imaging results as follows.

Simple cyst (BIRADS 2) – No further imaging. Cyst may or may not be aspirated if not responsible for symptoms. If aspirated, fluid cytology is not required. No imaging follow-up is recommended.

Complicated cyst (BIRADS 2/ BIRADS 3) – No further imaging or follow up is required if these are deemed to be benign. If any concern exists a follow-up ultrasound in 6 months' time is advised.

Cyst with suspicious solid component (BIRADS 4) - complex cystic and solid mass or a mass with partly cystic partly solid echotexture - image guided aspiration and core biopsy is advised.

Solid Definitely benign mass (BIRADS 2) – like hamartoma, calcified fibroadenoma, lipoma, fat necrosis, etc - clinical follow-up only.[4]

Solid probably benign mass (BIRADS 3) – Imaging follow-up only. Ultrasound guided core biopsy may be considered in cases of high risk factor or clinical suspicion for cancer, already diagnosed cancer in same or contralateral breast, planned pregnancy, extreme patient anxiety or if follow-up cannot be ensured.

Suspicious mass (BIRADS 4 or 5) – Image guided core biopsy.

Calcifications only: No further evaluation if typically benign. All other calcifications which are not typically benign must be subjected to core biopsy. Specimen radiograph of harvested cores is recommended to establish retrieval of calcification in harvested cores.

Biopsy results: For BIRADS 4 lesions, if biopsy result is benign, follow-up imaging after 6 months is advised. If biopsy result is malignant then appropriate treatment is advised. If biopsy result is inconclusive (equivocal or atypia only) then re-biopsy, preferably vacuum assisted biopsy is recommended.[5] For BIRADS 5 lesions, re-biopsy is must if histopathology result is not malignant on initial biopsy.

Mass on Clinical Breast Examination (CBE) but negative imaging – palpation guided biopsy if indicated clinically.

No mass on CBE as well as on imaging – no further imaging. Follow-up with CBE may be considered.

Breast lump in pregnant or lactating women - Ultrasound is the imaging modality of choice for any age as breast is mammographically dense in these situations. If mass is identified on ultrasound, further management will be as per BIRADS category. In case of suspicious or equivocal ultrasound finding, mammography can be considered during pregnancy or lactation as it is better than ultrasound in detection of calcifications and subtle architectural distortion. CEMRI of breast is not recommended during pregnancy but can be considered during lactation.[4]

BREAST PAIN (MASTALGIA) AND MASTITIS

Mastalgia alone is generally not a feature of breast cancer. It may be due to aberrant response of breast tissue to the hormonal variations, especially if it is cyclic, bilateral and associated with vague nodularity of the breast. Other causes may include infection, trauma and some drugs (Spironolactone, Digoxin, Haloperidol for example).

Age of the patient, history and CBE will guide the imaging protocol. No imaging is required if pain is bilateral or diffuse, cyclic and CBE is normal. If breast pain or tenderness is focal or associated with mass, then imaging is required. [6]

Imaging: Ultrasound only for age up to 30 years and both mammography and ultrasound for age more than 30 years. Mammography should be avoided in lactating and highly painful breasts which preclude adequate compression during mammography. Ultrasound alone is sufficient in them. An imaging protocol as outlined for breast lumps in preceding sections may be followed.

Acute mastitis is characterized by focal breast pain, inflammatory skin changes along with fever and malaise. It can be lactational or non-lactational. It is diagnosed clinically and managed conservatively with antibiotics.

Imaging is recommended only if mastitis is non-resolving or progressive. Ultrasound is the modality of choice as mammography is difficult to perform and interpret in acute mastitis. If mastitis has liquefied into an abscess formation, surgical or ultrasound guided drainage should be considered.[7] One or repeated aspiration with large bore needle is recommended. Indwelling catheter drainage is effective for large recurring abscess.[8]

Follow-up mammography and ultrasound is recommended in non-lactational mastitis or abscess after acute symptoms have resolved. A non-resolving lesion should be subjected to biopsy.[9]

If inflammatory breast cancer is suspected, then ultrasound of both breasts and if possible, mammography should be performed.[10] Image guided biopsy should be obtained if focal lesion is seen. If no focal lesion is seen, then Contrast Enhanced Magnetic Resonance Imaging (CEMRI) of both breasts should be performed to localize the primary tumor.

NIPPLE DISCHARGE

Usual causes include physiological, hormonal disorders, benign lesions like papilloma and duct ectasia and uncommonly, cancer. Some drugs (Methyldopa, Cimetidine, Reserpine, antipsychotics and oral contraceptives) can also cause nipple discharge.

Good CBE is initial step. Color of the discharge should be noted. Multiduct or expressible only clear, yellow, green, grey, black or white discharge indicate physiological or benign causes. CBE should be performed and if negative, then assurance is adequate. Imaging is not required. Serum prolactin levels and thyroid profile may be obtained if patient is not pregnant nor lactating and hormonal cause is suspected. If infection is suspected, then antibiotics for one week and re-assessment with CBE are recommended. Occasional bilateral bloody discharge in children is also self-limiting and no imaging is required.

Risk of breast cancer is high if nipple discharge is from single duct, spontaneous, serous or bloody, associated with lump on CBE or age is more than 50 years [11]. Presence of any one or more of these factors is considered as pathological duct discharge. Unilateral nipple discharge is uncommon in males but it is more likely to be associated with underlying cancer, than in females. Hence, good clinical and imaging evaluation is required in men with unilateral duct discharge, irrespective of age.[12]

Ultrasound only (age up to 30 years) and mammography with ultrasound (age more than 30 years) should be performed. While performing ultrasound on affected side, good attention should be given to subareolar region with different maneuvers such as peripheral breast compression, rolled nipple or using standoff pad of gel.[12]

If abnormality is found on imaging, further management will depend on its BIRADS category. If no abnormality is found and discharge is serous or bloody, CEMRI should be obtained.

Ductography is a traditional modality for evaluation of single duct discharge and it is especially accurate in detection of small intraductal lesions. However, it is technically demanding, at times painful and less widely available. Mammography combined with ultrasound, and CE MRI of breast are reliable alternatives of ductography.[12]

Papilloma is a common cause of unilateral duct discharge. These are high risk lesions and hence if found on imaging, surgical excision rather than percutaneous image guided biopsy may be considered[12]. If clinical or imaging findings are suggestive of duct ectasia or periductal mastitis, culture sensitivity of duct discharge followed by appropriate antibiotic treatment should be considered [13]. If CBE and imaging are negative and discharge is persisting, surgical exploration (microdochectomy) should be considered [14].

PATIENTS WITH OPEN, DISCHARGING OR ECZEMATOUS SKIN LESION

These include patients with chronic infection with sinus formation such as Tuberculosis, recent lumpectomy or trauma or those with locally advanced fungating cancers. After history and CBE, initial imaging should be with bilateral breast ultrasound. Mammography is difficult to perform in these patients. Further management will be guided by CBE and ultrasound findings.

In patients suspected to have breast cancer and no definite mass is found on CBE or ultrasound, CEMRI of breasts is recommended. It is also recommended if cancer is already diagnosed on lumpectomy and breast conservation is being considered [15].

If patient has eczematous skin changes at or around nipple-areola, with or without duct discharge, dermatitis should be excluded first. Other cause is Paget's disease and hence CBE, mammography and ultrasound should be performed. If it is negative, CE-MRI of breast should be obtained. Image guided biopsy of any suspicious lesion on imaging and/or eczematous nipple should be undertaken.

PATIENTS ALREADY DIAGNOSED WITH BREAST CANCER

A. IMAGING FOR LOCAL EXTENT OF BREAST CANCER

Preoperative breast imaging should include bilateral mammography and ultrasound. If additional lesion is seen on any of these imaging tests, further management depending on BIRADS category of the additional lesion is considered. BIRADS 2 lesions can be ignored and surgery undertaken as per the plan. If additional lesion is BIRADS category 3,4 or 5, its image guided biopsy is recommended.

Preoperative CEMRI of both breasts is not routinely recommended, however, can be considered as per institutional policy. It is recommended in cases of lobular carcinoma, young women and those with dense breasts (ACR-BIRADS density C or D) [2,16]. It is also recommended for problem solving, for example if there is discrepancy in the clinically palpable extent of disease and the size of lesion on mammography and ultrasound. It may be useful in a lady with breast implants if optimum assessment for multicentricity or multifocality is not possible based on mammography and ultrasound alone.[2] Patients who have neoadjuvant chemotherapy are best monitored with breast MRI to assess response to treatment. It is also recommended if accelerated partial breast irradiation (APBI) is being considered. If additional suspicious lesion is seen on MRI and it can change the planned treatment, a biopsy of such lesion should be considered.

Pre-operative ultrasound imaging of axilla is recommended in patients with clinically node negative breast cancer. Detection of axillary lymph node involvement on ultrasound will lead to full axillary dissection during surgery instead of sentinel lymph node mapping. Abnormal lymph node detected on ultrasound may be subjected to ultrasound guided FNAC or biopsy for confirmation of nodal metastases. Mammography or MRI are not recommended for preoperative evaluation of axilla.

B. IMAGING FOR ASSESSMENT OF RESPONSE TO NEO-ADJUVANT CHEMOTHERAPY

If patient with large operable breast cancer or one with locally advanced breast cancer is considered for neo-adjuvant chemotherapy before surgery, then image guided core biopsy with complete histological analysis, tumor grade and ER, PER, HER2 receptor status should be obtained before initiation of chemotherapy. FNAC diagnosis only is not sufficient. If breast conservation surgery is considered in such a patient and breast mass is devoid of calcifications, placement of radio-opaque marker clip in the tumor is highly recommended [17]. This clip will help to localize the tumor in case of complete clinical and imaging resolution of the lesion after chemotherapy.

Imaging is required to monitor response to chemotherapy, identify non-responders early so that chemotherapy may be changed or stopped. At the end of chemotherapy, it is required to assess the extent of residual tumor and to identify those who are likely to have achieved complete pathological response. Combination of mammography and ultrasound is the standard modality to assess response to chemotherapy. CE MRI is most accurate imaging modality but should be used only if pre-chemotherapy good quality MRI scan is available. PET-CT is not recommended for assessment of response to neo-adjuvant chemotherapy.

C. IMAGING FOR METASTATIC WORK-UP

The stages mentioned in the following paragraphs are as per anatomical staging in the 8th edition of American Joint Committee on Cancer (AJCC) Cancer Staging Manual of The American College of Surgeons (ACS).[18]

For early breast cancers (T1 or T2, N0 or N1, M0) which are up to 5 cm in size, with no axillary lymphnodes or mobile level 1/2 ipsilateral axillary lymphnodes, with no distant metastases (ie upto T2N1M0 of stage 2B, AJCC manual), routine use of investigations to detect occult distant metastasis is not advised due to false positive studies and the low yield of these investigations. [18, 19] A chest x-ray is sufficient. Any additional tests performed in early breast cancer should be directed by clinical signs and symptoms [18-20]. For example Tc99m-methylene diphosphonate (MDP) Bone scan is recommended if serum alkaline phosphatase is elevated or if patient has localized bone pain [2,18]. Abdominal imaging is to be performed if there are abnormal clinical findings or liver function tests. Similarly if there are suspicious chest symptoms a CT scan of the chest is advised.[18, 20]

Metastatic work-up with Chest x-ray, ultrasound of abdomen & pelvis and liver function tests are the basic essential tests to be performed from T3N0M0 of stage 2B of AJCC staging, and thus includes T3-4, any N as well as N2-3, any T cancers.[19] However instead of these investigations it is preferred to perform CECT Chest & abdomen and MDP Bone scan.[19] Alternatively PET-CT alone could be performed although this is not routinely advised.[19]

Image guided biopsy of metastatic lesions is not required if imaging findings are fairly suggestive of metastases. However, biopsy may be required if imaging findings are equivocal or if there is a single lesion which may alter the intent of management.

PATIENTS WITH METASTASIS FROM CANCER OF UNKNOWN PRIMARY SITE

These include women presenting with axillary lymph nodes or other lesions in the body which show malignancy on FNAC or biopsy. Bilateral mammography and breast ultrasound are recommended to exclude breast cancer. If mammography or ultrasound is positive then image guided biopsy should be performed. CEMRI is recommended if mammography and ultrasound are normal or equivocal but patient has unilateral axillary lymphadenopathy and breast cancer is suspected on FNAC/biopsy of lymph nodes [21].

PATIENTS WITH TREATED BREAST CANCER ON FOLLOW-UP

Regular physical examination and annual mammography is recommended [2]. Mammograms must be compared with previous mammograms, even if these appear normal. Any suspicious or new lesion not typically benign should be subjected to biopsy.

Follow-up systemic imaging to detect metastases is not routinely recommended, unless patient is symptomatic [22].

If metastases are detected on follow-up, its biopsy is not required if imaging findings are typical of metastases. However, image guided core biopsy of new metastasis is required to assess hormone receptor status if it has developed after long follow-up. It is also required if receptor status of breast cancer is not already known [17].

DISCLAIMER

Above mentioned are the broad guidelines for management of patients with breast symptoms in India and intended for the use of qualified medical caregivers only. These are based on various national and international guidelines and personal experiences and opinions of BISI members; as there is no large credible Indian data to formulate these guidelines. These guidelines are purely recommendatory and general purpose only in nature. Actual decisions for management of the patients should be individualized according to own judgment of the caregiver and tailored on case-to-case basis. As scientific knowledge is continuously improving, a regular update of the same by the caregiver is essential. Failure to do so may result in untoward patient management or outcome and BISI members or BISI as the organization cannot be held responsible for that in any manner.

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