

Diagnostic imaging for breast cancer symptoms



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“ The role of diagnostic imaging in the initial investigation of female patients symptomatic for breast cancer, and its subsequent application in the staging process.”

Introduction

Breast Cancer is the term used for cancers found within the breast tissue. Usually breast cancer is the result of a small change in the regulatory cycles that the tissue goes through. Any changes in these can result in malignant growths within the breast tissue. As stated by Breast Cancer Now (2016), “ Breast cancer is the most commonly diagnosed cancer in women in the UK” with over 50, 000 new cases diagnosed in women each year, in the UK alone, thus approximately 1 in 8 women will be diagnosed with some form of breast malignancy in their lifetime. Furthermore, not all breast cancer occurs in females, in the UK roughly 350 men are also diagnosed with breast cancer each year. The survival rate of breast cancer is quite high at around 90%, states Breast Cancer Care (2016), which highlights how effective treatment currently is. However, it is the most common cause of death in women aged 40-50 . *Vaidya, J. S. et al (2012a)*.

Per *Sestak, I. et al (2012)*, there are many factors that can predispose a person to the risk of breast cancer. These include: increasing age, geographical variation, breast density, age at first pregnancy, age at menarche and menopause, family history, genes, previous breast disease, radiation, lifestyle, oral contraceptives and hormone replacement therapy.

As stated by *Vaidya, J. S. et al (2012a)*, Breast cancer lumps are usually hard and painless, with an irregular shape. They are approximately 2cm before

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they are palpable and can be felt. Most lumps are found in the upper outer quadrant of the breast. A lump is the most common symptom but there are other signs and symptoms that can be indicative of breast cancer. These other symptoms include: bleeding from the nipple (rare), change in shape or size, ulceration, swelling in breast or arm due to blockage of lymphatic circulation, peau d'orange which is usually the result of fluid in the dermis and axillary lumps. These symptoms are not present in all cases and are indicative of the different stages and kinds of breast cancer.

Content & Discussion

People with breast cancer symptoms usually undergo what is known as a “Triple Assessment”. A triple assessment comprises of a clinical examination, imaging examinations and pathological evaluation. This assessment process is usually able to diagnose 95% of malignant breast cancers. *Vaidya, J. S. et al* (2012b)

Vaidya, J. S. et al (2012b) also states that before a clinical examination occurs, the patient's history is taken into consideration, as this can aid the diagnose or other potential causes of the symptoms. Usually the history that is considered includes: the history of the current complaint, family history of breast or ovarian cancers, HRT and oral contraceptives history, previous diseases and surgeries, allergies and smoking history.

Clinical Assessment of Breast Cancer

As stated before clinical examination is the first step in a triple assessment to diagnose breast cancer. Clinical examination is done to assess dimpling,

which is usually an early sign, as it occurs because of the contraction of the ligaments of Cooper. Clinical examination can also distinguish between coarse nodular tissue and an actual lump in the breast tissue. The colour and site of any discharge at the nipple is also recorded and tested for any blood within the discharged fluid. *Vaidya, J. S. et al (2012b)*.

Imaging in Diagnosis of Breast Cancer

As stated by *Vaidya, J. S et al (2012b)* , “ Both mammography and ultrasonography have important roles in the diagnosis of breast cancer, but the use of other modalities, such as magnetic resonance and infrared imaging, is being developed.”

Mammography can detect over 95% of clinically detectable cancers. However, it does not aid the diagnosis of a patient with a discrete lump. In this case diagnosis relies heavier on cytology and histology. It may also be of use in the detection of cancer in patients with coarse nodular breasts and is particularly useful in dense breast tissues. *Vaidya, J. S. et al (2012b)*

Another use for mammography is to accurately assess where the cancer is located. This information can also be used to aid biopsy and surgeries.

Mammography can also reveal that there is an impalpable lump in the other asymptomatic breast which otherwise would have gone undetected. *Vaidya, J. S. et al (2012b)* If a mass is detected on a mammogram, a range of codes are typically used to determine the potential malignancy of the mass. These are defined by Willet, A. et al, for the Association of Breast Surgery (2010) as:

- M1 - Normal
- M2 - Benign
- M3 - Indeterminate/Likely Benign
- M4 - Suspicion of Malignancy
- M5 - Highly suspicious of Malignancy.

Another key imaging technique used in the diagnosis of breast cancer is ultrasonography. Ultrasound shows the difference between a cyst or a more solid mass. Therefore, a mass can be confirmed to be a cyst and can be drained using needle aspiration. However, a blood-stained aspirate may be a result of a cancer within the cyst which was previously unidentified. The sensitivity and specificity of ultrasound in the diagnosis of breast lumps has continued to improve with growing technological advances. Benign lumps appear as well-defined masses with no acoustic shadow. Malignant lumps are ill-defined masses, with a varying echogenicity and/or have evidence of microcalcifications within them. Ultrasound is also the preferred imaging method in women under the age of 30, as their breasts tend to be less dense and are therefore radiosensitive. *Vaidya, J. S. et al (2012b)*. The *NICE Guidelines (2015)*, also state that, “ultrasound evaluation of the axilla should be performed for all patients being investigated for early invasive breast cancer”.

Fine-needle aspiration cytology is also used in breast cancer diagnosis by inserting a small needle into a lump which is located during the examination using ultrasound. The aspirate on the needle is then examined under a microscope by a pathologist which can then diagnose a breast cancer with

almost 100% specificity depending on their level of skill and training. *Vaidya, J. S. et al (2012b)*

Imaging in Staging of Diagnosed Breast Cancer

“ If the tumour is large and there is extensive lymph-node involvement, preoperative staging is prudent.” *Vaidya, J. S. et al (2012b)*

As stated by RCR guidelines (2014), the objectives of staging are to: assess the size of a tumour, assess for other involvement of the skin or chest wall, assess multifocality of tumour, to assess the nodal status and to assess for any metastatic spread.

MRI is used in staging any indeterminate lesions. The expense of MRI is now becoming less of an issue as the cost of an MRI breast coil is considered relatively low. The injection of a contrast agent during MRI enables the vascularity of a lesion to be visualised. The downside of this is that a specifically trained team is required to undergo this route of imaging. *Vaidya, J. S. et al (2012b)*

NICE guidelines (2015), state that MRI is not recommended in the preoperative assessment of patients with invasive breast cancer that has been proven by biopsy or ductal carcinoma in-situ. It should only be offered to those where the extent of metastases is indeterminate, breast density has caused mammography to be indefinite or to assess tumour size to aid surgery for invasive lobular cancer.

Computed Tomography is stated by the RCR Guidelines (2014), to be used with patients who have advanced symptoms and are suspected to have a

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further progressed cancer. Reasons for request of a CT to stage breast cancer include: bone pain and breathlessness. If the use of CT for staging is used, intravascular contrast media should be employed during the scan. The scan should include the supraclavicular fossa, the chest and the liver.

The RCR Guidelines (2014), state that Photon Emission Tomography should not be used for early stage breast cancer but should be used more to assess metastatic spread. It is also used to assess potentially multi-focal disease or suspected recurrence if a patient has particularly dense breasts.

Axially node status is usually assessed by using US, with the use of fine-needle aspiration or biopsy of any suspicious nodes . *RCR Guidelines* (2014).

Vaidya, J. S. et al (2012b) also suggest that routine staging in early breast cancer, as the results are usually less than 4%. Thus, these investigations can slow down the otherwise relatively quick treatment and can cause the patient unnecessary anxiety as they await results.

Follow-up and Surveillance after treatment of Breast Cancer

It is suggested by *Vaidya, J. S. et al* (2012b) that patients who have had a mastectomy are at a higher risk of developing cancer in the remaining breast and should therefore undergo regular mammograms for surveillance. They also suggest that colour Doppler ultrasound scanning of a breast that has had a malignant tumour postoperatively is likely to increase the chances of an early diagnosis should there be any recurrence.

RCR guidelines (2013) state that women who have been treated for breast cancer under the age of 50 should have a yearly mammogram as

surveillance follow up. After 50 the guidelines are unclear but it is currently recommended that surveillance mammograms are routinely performed every 2-3 years.

NICE guidelines (2015), also state that an annual mammography should be offered to all those with early breast cancers, including DCIS until they reach the age for screening. These guidelines recommend that patients of the age for screening should have also annual mammograms for 5 years.

The *NICE guidelines* (2015), further suggest that US nor MRI should be offered in post-treatment surveillance for those who have been treated for DCIS or other early stage breast cancers.

Conclusion

In summary, it is essential that patients presenting symptoms which usually pertain to a breast cancer undergo a thorough assessment, including multiple imaging examinations not just for the diagnosis of the cancer, but also the staging and the follow-up once the cancer has been successfully treated.

Mammography and Ultrasound are the two key imaging techniques that are vital in my opinion within diagnosis. They enable a fast and usually efficient result which can then be used for staging. Ultrasound can be seen to have more benefits as it does not use ionising radiation unlike mammography, but mammography is essential in those patients who have highly dense breast tissue. This is usually postmenopausal patients who tend to be the high-risk group of developing breast cancer.

CT and Ultrasound are mainly used during staging. This stage is vital in patients with more progressive breast cancer, but if the tumour has been caught in the early stages, staging methods can usually be skipped as it is more efficient to immediately commence treatment methods.

Follow-up imaging is also essential as those who have undergone treatment of breast cancer are at higher risk of recurrence in either breast.

In conclusion, imaging is one the most essential tools available in the diagnosis, staging and follow-up of breast cancer. Without the current imaging techniques, we have today the 95% survival rate of breast cancer would likely be nowhere near as high.

Reference List:

- Breast Cancer Care. (2016). *Prognosis*. Available: <https://www.breastcancercare.org.uk/information-support/facing-breast-cancer/diagnosed-breast-cancer/diagnosis/prognosis>. Last accessed 27th Mar 2017.
- Breast Cancer Now. (2016). *Breast Cancer Statistics*. Available: <http://breastcancernow.org/about-breast-cancer/what-is-breast-cancer/breast-cancer-statistics>. Last accessed 27th Mar 2017.
- NICE guidelines. (2015). Early and locally advanced breast cancer: diagnosis and treatment. *Breast Cancer*. Last Accessed: 30th Mar 2017

- Sestak, I et al. (2012). Breast Cancer: Epidemiology, Risk Factors and Genetics. In: Dickson, J *ABC of Breast Disease* . 4th ed. London: BMJ Books. p41-47.
- The Royal College of Radiologists (2013). Guidance on screening and symptomatic breast imaging. 3rd ed. London: The Royal College of Radiologists. Pg. 7
- The Royal College of Radiologists (2014). Recommendations for cross-sectional imaging in cancer management. 2nd ed. London: The Royal College of Radiologists. P2-4
- Vaidya, J. S., Joseph, D. & Jones, A. (2012b), *Fast Facts: Breast Cancer - Diagnosis*, 4th ed. edn, Health Press Limited, Abingdon. P47-64
- Vaidya, J. S., Joseph, D. & Jones, A. (2012a), *Fast Facts: Breast Cancer - Pathophysiology* , 4th ed. edn, Health Press Limited, Abingdon. P28-46
- Willet, A. et al. (2010). Diagnosis and Imaging. *Best Practice Diagnostic Guidelines for Imaging of Symptomatic Patient* . Department of Health. p 49.