

Role of Diagnostic Imaging in Invasive Ductal Carcinoma

Diagnosis and Staging

Invasive Ductal Carcinoma

Breast cancer is one of the leading causes of death across all nations. Invasive Ductal Carcinoma is the most common type of breast cancer that affects thousands of people across the world. In fact, 80% of all breast cancers are invasive carcinomas, with a majority of those being specifically invasive ductal carcinoma.¹ Invasive ductal carcinoma begins in the milk ducts and spreads to surrounding breast tissue. Carcinoma refers to “any cancer that begins in the skin or other tissues that cover internal organs.”¹ Cancer is due to rapidly growing cells that are malignant.²

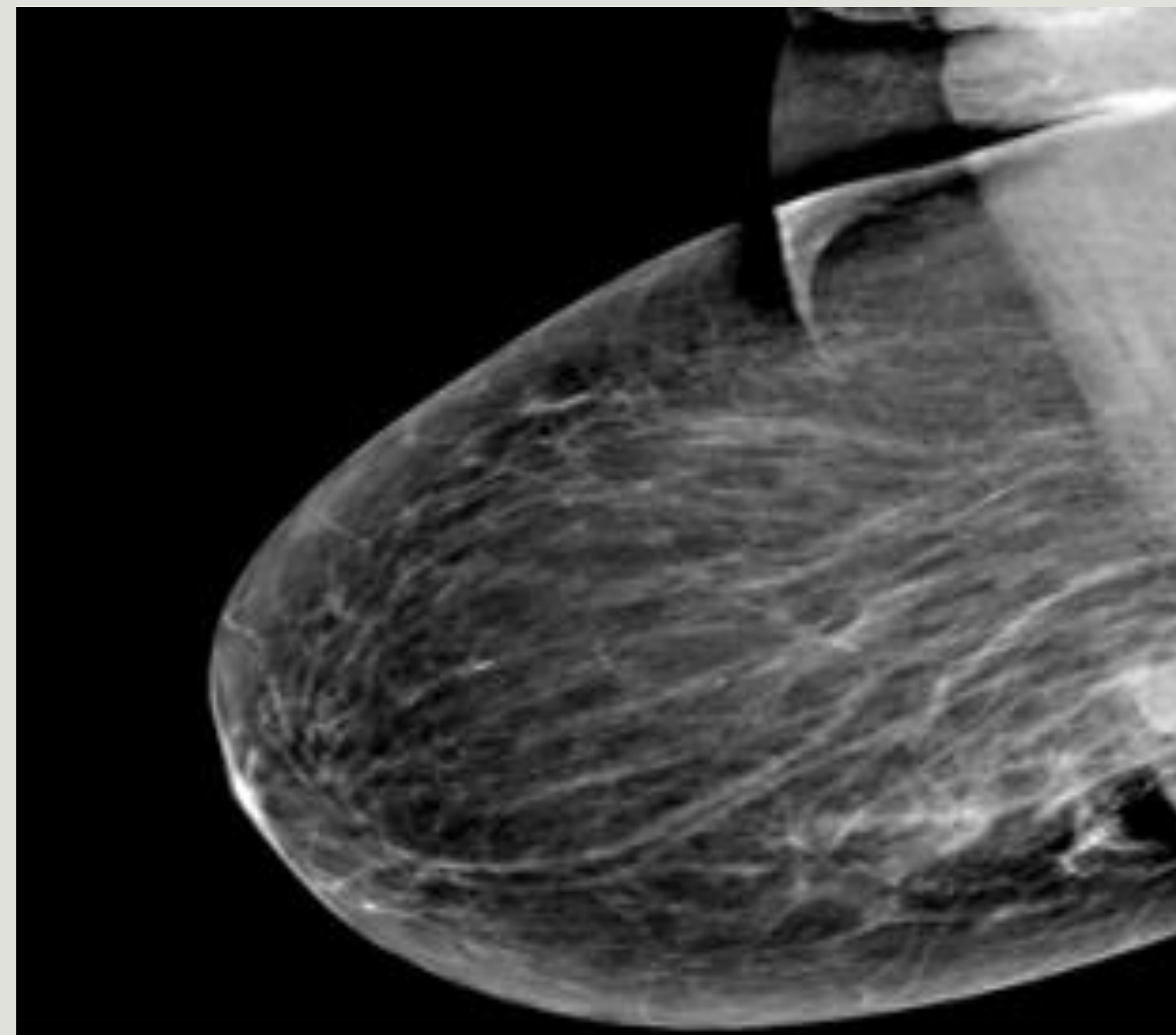


Figure 1: Mammogram of the right breast showing a deep tissue mass.⁴

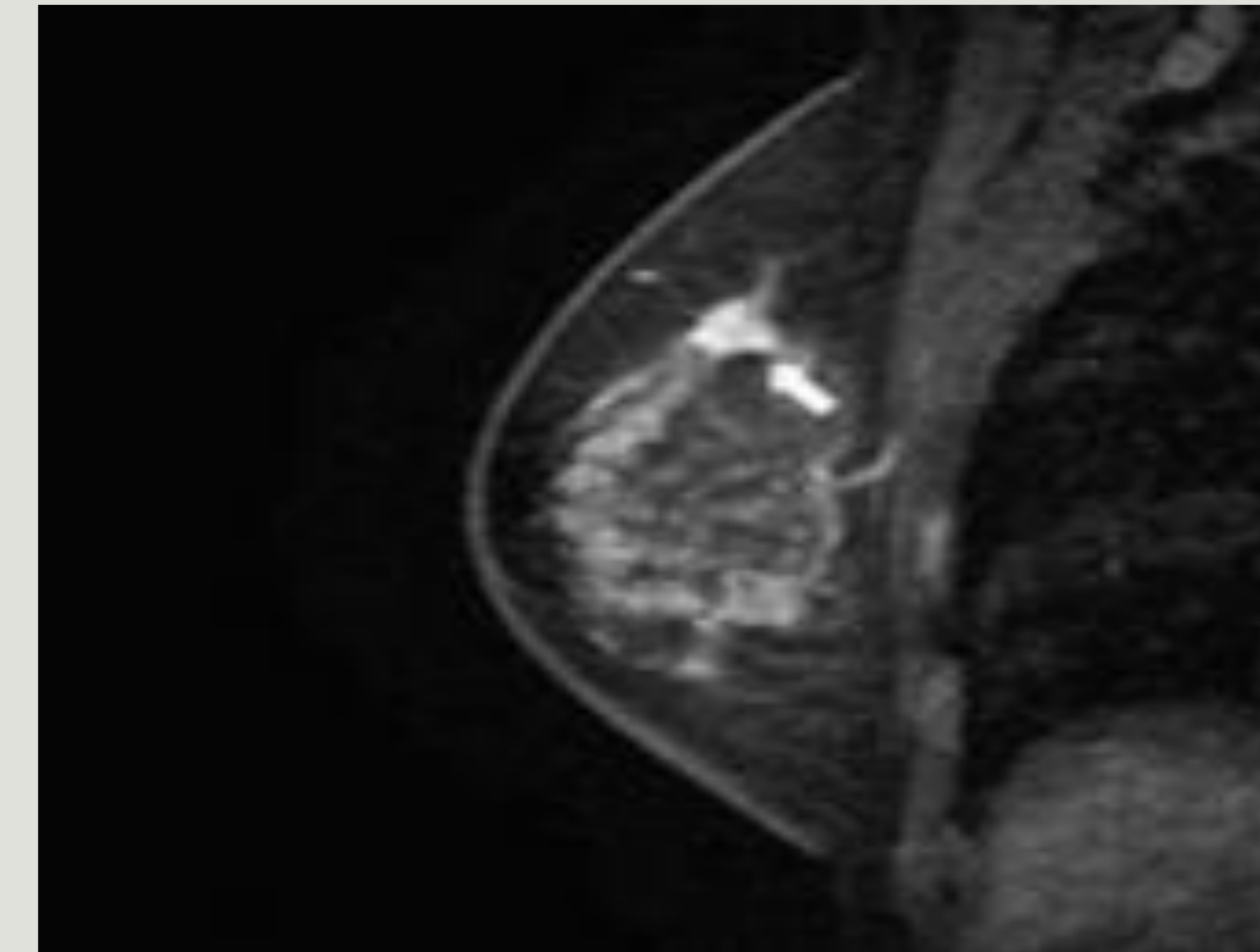


Figure 3: Breast mass enhancement in an MRI.⁷

Magnetic Resonance Imaging

MRI works by using powerful magnets to realign hydrogen atoms in your body. MRI uses radio waves which causes the aligned hydrogen atoms to emit faint signals which in turn are used to create cross-sectional images (see **Figure 3**).⁷ MRI is best for dense breast tissue, or those at high risk of having breast cancer.. It is also a good tool to detect the invasiveness of breast abnormalities and give an accurate representation of where the abnormal tissue lies.⁸

Prognosis

Prognosis is dependent on the stage of cancer. The lower the stage, the less involvement of surrounding tissue, and the higher the chance of survival. Stages of cancer range from 0 to 4 (see **Table 1**).⁹

References

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Stage of breast cancer	5 year survival rate
Stage 0	100%
Stage I	100%
Stage II	Around 93%
Stage III	Around 72%
Stage IV	22%

Table 1: Five-year survival rate of breast cancer.⁹

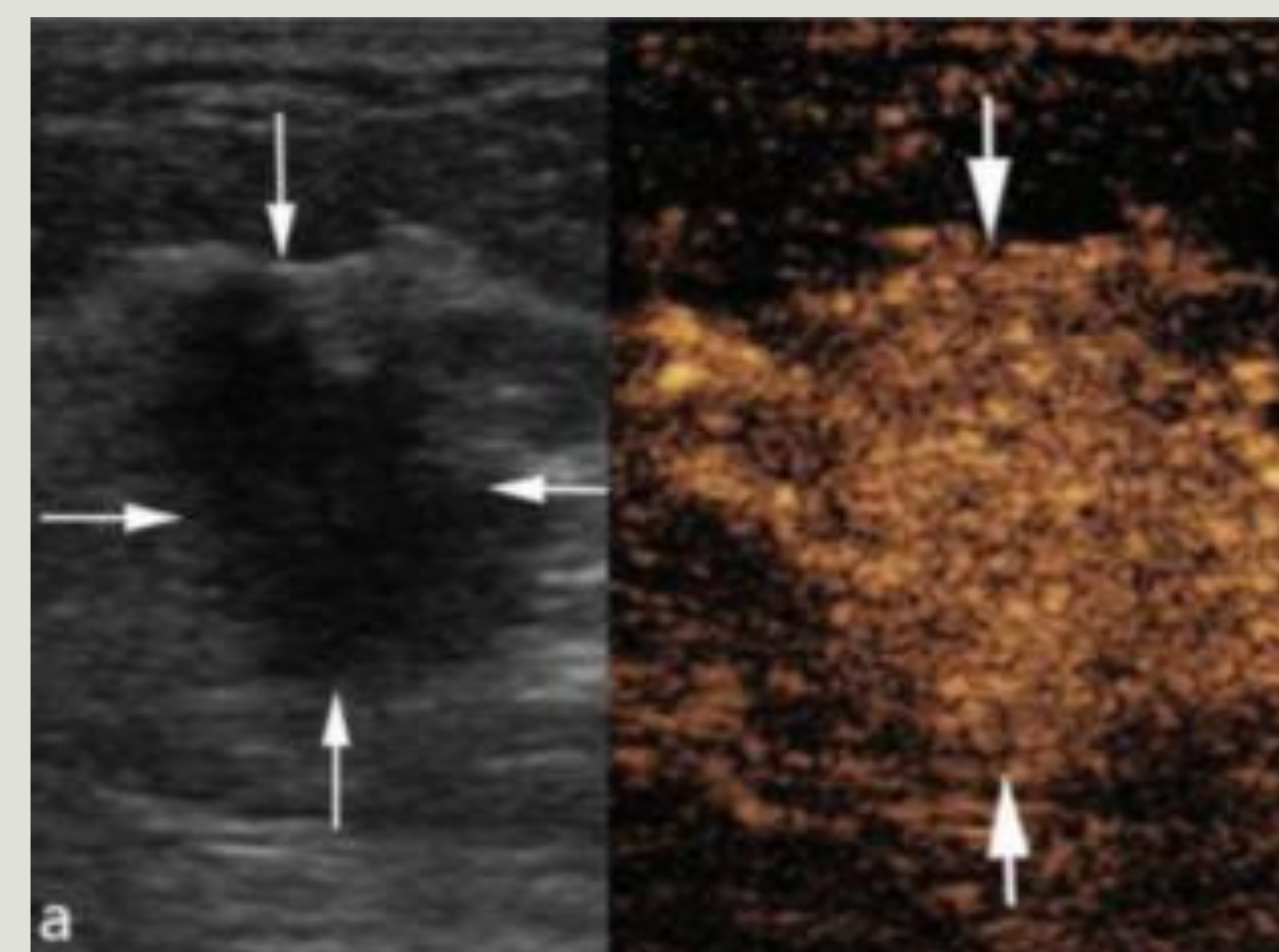


Figure 2: Ultrasound showing a lump in the breast tissue with heterogenous enhancement.⁵

Mammography

Mammography is considered the “gold standard” for early detection of breast cancer. Mammography uses x-rays to image the inside of the breast tissue including masses, calcifications, and other suspicious areas that could be a precursor for breast cancer (see **Figure 1**).³

Ultrasound

With ultrasound, the size of the tumor is visualized. Ultrasound can guide physicians in a breast biopsy procedure to decide what kind of cancer the patient has, or if he/she has cancer at all.¹ It does this by bouncing sound waves off the breast tissue and turning it into a diagnostic image.⁵ They use a high-frequency linear transducer which provides a very accurate guide to the lump (see **Figure 2**).⁶