Patient information: Breast cancer guide to diagnosis and treatment (Beyond the Basics)

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INTRODUCTION

Breast cancer is the most common female cancer in the United States, the second most common cause of cancer death in women (after lung cancer), and the main cause of death in women ages 45 to 55. When found and treated early, breast cancer is often curable.

UpToDate contains a number of patient information articles that discuss breast cancer. The purpose of this overview is to provide a guide to the issues and questions that arise in women with newly diagnosed breast cancer. This topic can serve as a "road map" to the patient information articles that are relevant to your particular situation.

This guide will focus only on the diagnosis and treatment of breast cancer. Other articles within UpToDate discuss the risk factors for breast cancer and methods to prevent breast cancer in women who are at high risk. (See "Patient information: Factors that modify breast cancer risk in women (Beyond the Basics)" and "Patient information: Medications for the prevention of breast cancer (Beyond the Basics)".)

IMPROVEMENTS IN CANCER CARE

Increased screening — The death rate from breast cancer has declined about 20 percent over the past decade. This is due in part to increased screening as well as earlier and improved treatment for breast cancer. Screening usually detects the disease at an earlier stage when the chances of successful treatment are higher. Early detection and treatment of breast cancer improve survival because the breast tumor can be removed before it has a chance to spread (metastasize). In addition, other treatments, called adjuvant systemic therapies (described below) can be used to prevent cancer cells that have escaped the breast from growing in other organs. (See "Patient information: Breast cancer screening (Beyond the Basics)".)

Adjuvant systemic therapy — Systemic (body-wide) anti-cancer treatment that is given before or after surgery is called adjuvant systemic therapy. Adjuvant systemic therapy prevents cancer cells that may have escaped from the breast before detection from growing into metastases, which are usually not curable. Thus, adjuvant systemic therapy also contributes to the decline in mortality due to breast cancer.

Three types of anticancer agents are used for breast cancer adjuvant therapy:

- Endocrine therapy (Anti-estrogen treatment)

- Chemotherapy
- Molecularly targeted therapy against a protein (termed HER2)

The goal of adjuvant systemic therapy is to eliminate or prevent the growth of any cancer cells that may have escaped the breast and that might grow in other organs. Areas of breast cancer growth outside the breast are called "metastases." Axillary lymph nodes are the first and therefore the most common location of metastatic disease. Patients with metastases or cancer cells in other organs such as liver, lung, bone are rarely cured. However, adjuvant systemic therapy may prevent metastases in a large fraction of patients and thus cure many women who would not be cured otherwise. Adjuvant systemic therapy, therefore, has become an important component of breast cancer treatment because it significantly decreases the chance that a cancer will return. This in turn improves the chances of surviving breast cancer.

DIAGNOSING BREAST CANCER

Abnormal lump — Breast cancer can be discovered when a lump or other change in the breast or armpit is found by a woman herself or by her healthcare provider. In addition to a lump, other abnormal changes may include dimpling of the skin, a change in the size or shape of one breast, inversion (pulling in) of the nipple when it previously pointed outward, or a discoloration of the skin of the breast.

To evaluate a breast lump, a mammogram and a breast ultrasound are usually recommended. A breast biopsy may also be recommended (see 'Breast biopsy' below). A suspicious lump should never be ignored, even if a mammogram is negative. Up to 20 percent of new breast cancers are not visible on a mammogram.

Mammogram — A mammogram is a low-dose x-ray of the breast. The breast tissue is compressed for the x-ray, which decreases the thickness of the tissue and holds the breast in position, so the radiologist can find abnormalities more accurately. Each breast is compressed between 2 panels and x-rayed from two directions (top-down and side-to-side) to make sure all the tissue is examined. Mammograms are currently the best screening modality to detect breast cancer.

Breast cancer is often diagnosed with a routine mammogram, before a lump or other change in the breast develops. Even if the mammogram is performed because a lump was felt in one breast, both breasts need to be examined because there is a small risk of having cancer in both breasts.

Breast ultrasound — An ultrasound uses sound waves to look at breast tissue and can tell if a lump is a fluid filled cyst or a solid lump. An ultrasound is only used to examine a limited area of the breast and is not used as a screening test of the entire breast.

Breast MRI — Magnetic resonance imaging (MRI) uses a strong magnet to create a detailed image of a part of the body. It does not use x-rays or radiation, but does require injection of a contrast agent into a vein. Breast MRI may be recommended to aid in the diagnosis of breast cancer in selected situations. MRI is not recommended to detect breast cancer in most women because it is not as good as a mammogram for certain breast conditions, such as ductal carcinoma in situ (a type of noninvasive or early breast cancer). In addition MRI testing is more likely to identify suspicious findings that turn out **not** to be cancer (false positives).

The role of breast MRI for the diagnosis and management of breast cancer is evolving, and there is disagreement as to which women should undergo breast MRI in addition to mammography. Many experts restrict the use of breast MRI to the following situations: