MERRILL'S ATLAS OF

RADIOGRAPHIC POSITIONING & PROCEDURES

SIXTEENTH EDITION | VOLUME ONE

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Control of Pathogen Contamination

For the protection of health care workers and patients, the US Centers for Disease Control and Prevention (CDC) provides directives for infection control. The foundation of infection control practices is included in the Standard Precautions for All Patient Care. "They're based on a risk assessment and make use of common-sense practices and personal protective equipment (PPE) use that protect health care providers from infection and prevent the spread of infection from patient to patient."[4] Standard precautions include the following aspects of professional practice:

- Perform hand hygiene (Fig. 1.2A).
- Use PPE whenever there is an expectation of possible exposure to infectious material (Box 1.1).
- Follow respiratory hygiene/cough etiquette principles.
- Ensure appropriate patient placement.
- Properly handle, clean, and disinfect patient care equipment and instruments/devices; clean and disinfect the environment appropriately (see Fig. 1.2B).
- Handle textiles and laundry carefully.
- Follow safe injection practices; wear a surgical mask when performing lumbar punctures.
- Ensure health care worker safety, including proper handling of needles and other sharps (Fig. 1.3).
- Transmission-based precautions are used in addition to standard precautions for patients with known or suspected infections.

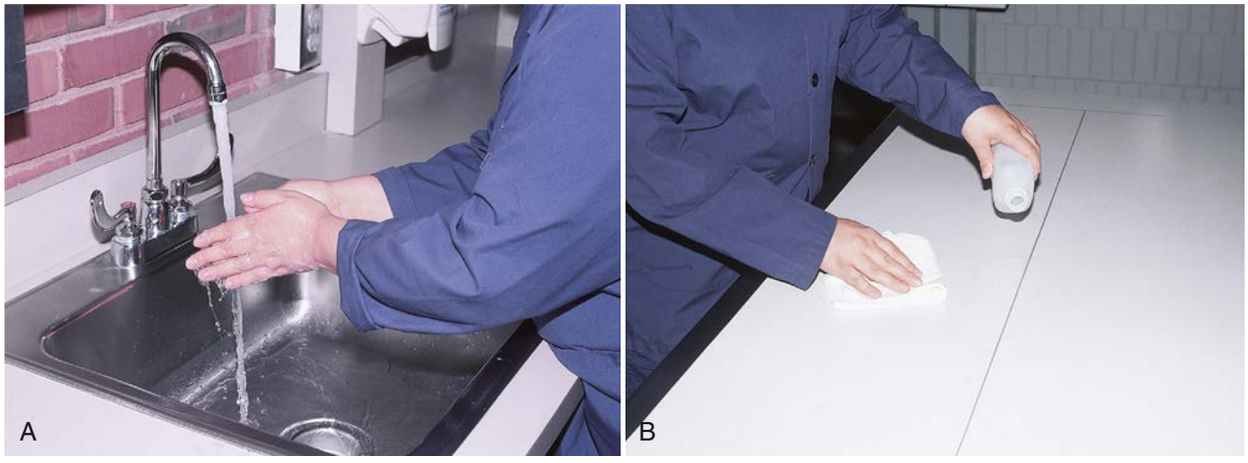

Fig. 1.2 (A) Radiographers should practice scrupulous cleanliness, which includes regular handwashing. (**B**) Radiographic tables and equipment should be cleaned with a disinfectant according to department policy.

BOX 1.1

Body fluids that may contain pathogenic microorganisms

Blood
Any fluid containing blood
Amniotic fluid
Pericardial fluid
Pleural fluid
Synovial fluid
Cerebrospinal fluid
Seminal fluid
Vaginal fluid
Urine
Sputum

Fig. 1.3 All needles should be discarded in puncture-resistant containers.

Male Mammography

EPIDEMIOLOGY OF MALE BREAST DISEASE

In the United States, more than 2400 men develop invasive breast cancer every year, and nearly 20% of these men die of the disease.[1] Although most men who develop breast cancer are 60 years of age and older, juvenile cases have been reported. Nearly all male breast cancers are primary tumors. An estimated 4% to 40% of male breast cancers are due to inherited mutations. Men typically have significantly less breast tissue, and screening mammograms typically are not performed for male patients; therefore, most male breast cancers are diagnosed as palpable lumps and are more likely to be diagnosed at advanced stages. The overall 5-year survival rate for male breast cancer is 84%, compared to 90% in women, which reflects this fact.[26] Other symptoms of breast cancer in men include nipple retraction, crusting, discharge, and ulceration.

Gynecomastia, a benign excessive development of the male mammary gland, can make malignant breast lesions more elusive to palpation. Gynecomastia occurs in 40% of male breast cancer patients; however, a histologic relationship between gynecomastia and male breast cancer has not been definitively established. Because gynecomastia is caused by a hormonal imbalance, it is believed that abnormal hormonal function may increase the risk of male breast cancer in these patients.[27] Other associated risk factors for male breast cancer include increasing age, positive family history, *BRCA1* and *BRCA2* gene mutations, and Klinefelter syndrome.[28]

Breast cancer treatment options are limited among male patients. Because men have less breast tissue, lumpectomy is not considered practical. Most of the male glandular tissue is located directly posterior to the nipple. Therefore a modified radical mastectomy, including dissection of the nipple, is usually the preferred surgical procedure.[29–31] Radiation and systemic therapy are considered when the tumor is located near the chest wall or when indicated by lymph node analysis. Similar to female breast cancer, the prognosis for male breast cancer is directly related to the stage of the disease at diagnosis. An early diagnosis indicates a better chance of survival. Survival rates among male patients with localized breast carcinomas are positive: 98% survive for 5 years.[26]

Routine Projections of the Male Breast

Male breast anatomy varies significantly from female breast anatomy. The pectoral muscle is more highly developed in men, and most of the glandular breast tissue is located directly posterior to the nipple. The radiographer must take this variance into consideration. The standard CC and MLO projections may be applied with success in most male patients (Figs. 18.38–18.40). For men (or women) with large pectoral muscles, the radiographer may perform the caudocranial (FB) projection instead of the standard CC because it may be easier to compress the inferior portion of the breast. In addition, the lateromedial oblique (LMO) projection may replace the standard MLO.

Fig. 18.38 Positioning for CC projection of male breast.

Fig. 18.39 Positioning for MLO projections of male breast.

Keep in mind that these unconventional views are rarely necessary but are viable alternatives in extreme cases. These projections may allow the radiographer to accommodate more successfully a patient with prominent pectoral muscles. Some facilities also use narrower quadrant compression paddles (8 cm [3 inches] wide) to compress the male breast or the extremely small female breast.[32] The smaller paddle permits the radiographer to hold the breast in position while applying final compression. A wooden spoon or a plastic spatula can be used to hold the breast in place, then can be slowly removed as the compression paddle replaces it.

Because most men who undergo mammography present with outward symptoms, mammography of the male breast is usually considered a diagnostic examination. It can be considered a screening examination for men who know they carry the *BRCA1* or *BRCA2* gene, or who have a history of breast cancer. The radiographer should work closely with the radiologist to achieve a thorough demonstration of the potential abnormality. In the male breast, most tumors are located in the subareolar region. Careful attention should be given to positioning the nipple in profile and to providing adequate compression of this area to allow the best visualization of this tissue.

Calcifications are rare in male breast cancer cases. When present, they are usually larger, rounder, and more scattered than the calcifications associated with female breast cancer. Spot compression and the magnification technique are common image enhancement methods for showing the morphology of calcifications.

Procedures other than mammography are used to diagnose male breast cancer. FNAB and excisional biopsy of palpable lesions are standard methods of diagnosis. Histologically, most breast cancers in men are ductal, and most are infiltrating ductal carcinomas. Very few in situ cancers are found in male patients.

Because breast cancer is traditionally considered a "woman's disease," the radiographer should remain sensitive to the feelings of the male patient by offering not only physical comfort but also psychological and emotional support during the procedure.

Image Enhancement Methods

The spot compression technique and the magnification technique are designed to enhance the image of the area under investigation.

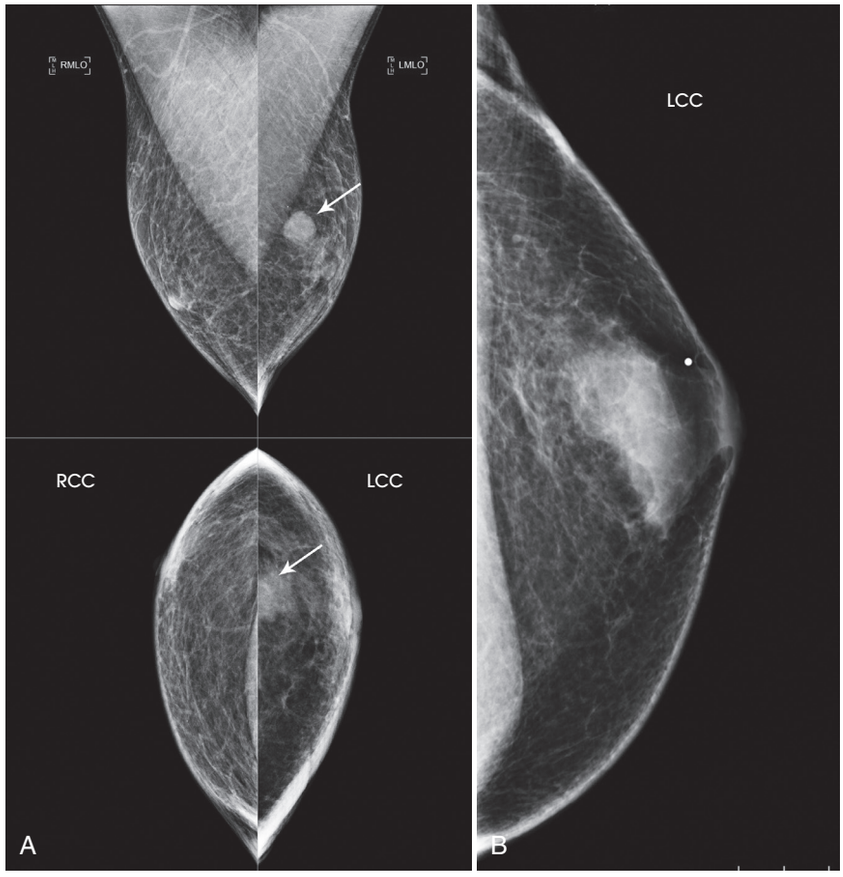

Fig. 18.40 (**A**) Four-view mammogram of a 55-year-old man with a new palpable lump *(arrow)*. This proved to be cancer on biopsy. (**B**) Left CC view of a 49-year-old male with a new lump. This proved to be gynecomastia, a benign process, on biopsy.