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The Perioperative Management of Breast Cancer

By Cathy Fortenbaugh MSN, AOCN, CSN,BSC, C

Breast cancer is the most common type of cancer in American women.[1] In fact, a woman is diagnosed with breast cancer every three minutes.[1] It touches the lives of all of us in some way. Last year, 193,700 women were diagnosed with breast cancer and 40,600 died of their disease.[2] Better diagnostic techniques, such as digital mammography, will help more breast cancers to be detected early, when they are most treatable.

Surgery is the first part of a multimodal approach for treating breast cancer that includes radiation and chemotherapy. Managing breast cancer is a team effort. Nurses are a crucial part of this team. A multidisciplinary approach is optimal. Ideally, a woman will consult with various members of the team in the same visit. The team members consist of surgical oncologists, plastic surgeons, radiologists, pathologists, radiation oncologists, medical oncologists, nurses, social workers, pastoral care, and nutritionists.

Detection and diagnosis

Many breast abnormalities are found by women themselves or their healthcare providers. Mammography detects abnormalities that are too small to be palpated. After discovery, the approach to evaluation depends on whether an abnormality is palpable or nonpalpable. Breast cancer cannot be diagnosed without a tissue sample that has been evaluated by a pathologist.

Palpable lesions

If the abnormality is palpable, there are several ways to obtain a tissue sample:

- fine-needle aspiration
- core-needle biopsies
- incisional or excisional biopsies

A fine-needle aspiration can be done in the surgeon's office. The surgeon inserts a needle with a syringe into the mass and aspirates some cells. The cells are then placed on a slide, fixative is applied, and the slide is sent to a cytology lab. This approach can identify breast cancer cells but cannot distinguish between invasive and noninvasive breast cancer. If the specimen is positive for breast cancer, further evaluation of the tumor needs to be done.

A core-needle biopsy is a procedure in which the surgeon uses a larger needle to obtain a core of tissue. The area is numbed prior to biopsy with a local anesthetic. There may not be enough tissue to evaluate hormone receptor status. A core-needle biopsy is most commonly done when the breast mass is large and treatment options are limited.

Incisional biopsy is done on a large breast mass where the entire area of abnormal tissue cannot be removed. The surgeon makes an incision and removes enough tissue to obtain an accurate diagnosis.

Excisional biopsy, also known as lumpectomy, is recommended in most cases, especially for women with early-stage breast cancer. The purpose of lumpectomy is to remove the entire breast mass and a margin or normal tissue. An axillary dissection or sentinel lymph node dissection may be done at the same time.

Nonpalpable lesions

Two procedures are used to evaluate nonpalpable breast lesions: needle wire localization with surgical biopsy (usually lumpectomy) and stereotactic needle biopsy.

Needle wire localization

Needle wire localization is done in the radiology department about one to two hours before the lumpectomy procedure. A hollowcore, 20-gauge plastic needle is used. Needles are approximately 2 to 6 inches long. An appropriate length needle is selected, based on the depth of the lesion and thickness of breast tissue. The needle is inserted with

mammographic, ultrasound, or stereotactic visualization guidance. A grid is superimposed on the film, allowing the radiologist to mark the coordinates of the abnormality. A local anesthetic is administered before the procedure.

After the needle is inserted, a mammogram is done to confirm accurate placement. When placement is confirmed, a flexible, fine hook wire is inserted through the hollow needle. The needle is removed and the wire stays in place. The patient goes from the radiology department to the operating room with the wire in place. The surgeon is able to feel the wire and remove it, the surrounding abnormality, and a margin of normal tissue. It is important to inform the patient that she will be going from the radiology department to the operating room with the wire in place. All other information, support, and education about what to expect in surgical biopsy should be completed before the procedure. A follow-up mammogram is done three months after the biopsy.[3]

Stereotactic needle biopsy

The stereotactic fine needle biopsy and stereotactic core biopsy are performed in the radiology department. Most stereotactic biopsies are done on microcalcifications seen on mammogram. Three-dimensional images are obtained by rotating the mammography unit. A computer determines the exact location of the tumor. The entire procedure takes about one hour.

The patient is positioned on a specifically designed table with an opening through which the breast is suspended. The radiologist stands under the table. Plates that are similar to those used in mammography immobilize the breast. The area is anesthetized prior to biopsy.

Several biopsies are taken from different angles. They are performed automatically by machine with a spring-loaded device. The patient will hear a clicking sound as each biopsy is done.

The stereotactic biopsy procedure is less invasive than a surgical procedure, but women should still expect to feel mild to moderate pain afterwards due to multiple biopsy sites. Due to bruising, the nurse may suggest the patient wear a post-surgical bra that provides light support to the breast (figure 1). If the biopsies are negative for breast cancer, a follow-up mammogram is done in three months to ensure that the proper area was biopsied.[4]

Patient support

Women experience a high level of anxiety between the time that an abnormality is found and pathology results are communicated. Nurses need to provide information and much support. Information needs to be reinforced. An explanation of upcoming tests or procedures and what to expect should be given to each patient and family, supplemented by written materials.

Prior to a surgical breast biopsy or surgery, the patient needs to know:

- time and place to report.
- who will be doing the procedure.
- how long it will take.
- expected side effects.
- need for anesthesia.
- follow-up care.
- when results will be available.
- how results will be communicated.

Ambulatory nurses are responsible for coordinating these efforts and making them as seamless as possible. [4]

Surgery for breast cancer

Before treatment, a woman should discuss surgical options, such as sentinel lymph node dissection, modified radical mastectomy, axillary dissection, and modifications in radiation therapy that may minimize tissue scarring and preserve the lymphatic system.

Sentinel lymph node dissection

Phase three clinical trials have found that sentinel lymph node dissection is an accurate, minimally invasive way to identify breast cancer that has spread to axillary lymph nodes in women who are diagnosed with earlystage disease. Since more breast cancers are being detected early, more women will be candidates for this procedure.[5]

The sentinel lymph node is defined as the first node or nodes to drain the primary tumor. Sentinel lymph node biopsy offers less chance of developing adverse effects, such as pain, numbness, scarring, and lymphedema, than axillary lymph node dissection. This procedure could replace axillary lymph node dissection as the standard of care.

This procedure can take from 30 minutes to 2 hours. A radioactive colloid substance, technetium, is injected around the primary tumor 30 minutes to 8 hours before surgery. If the tumor is nonpalpable, needle localization will be done to identify the tumor location. A handheld device called a gamma probe is used to find the node(s) that have absorbed the radioactive material. The skin is marked just before surgery, then a bright blue dye is injected around the tumor before surgical

preparation. This dye will travel through the lymphatic system to the sentinel node(s). The patient will receive either local or general anesthesia.

After the incision is made, the gamma probe is used to measure the sentinel node(s) before their removal. In addition, the node(s) will be stained blue.

Since sentinel lymph node biopsy is a surgical procedure, the patient may experience postoperative incisional pain. The skin may remain discolored for several days after the dye is injected. Women need to know that their urine may be green for a few hours after the procedure. Discharge instructions include care of the incision and dressing, pain control, and arm exercises.[6]

Modified radical mastectomy

Surgery for breast cancer is not new. There is evidence of breast surgery in ancient Egyptian mummies. William Halsted developed the radical mastectomy procedure in 1894. Today, the modified radical mastectomy is used. It differs from the Halsted radical mastectomy, because the pectoral muscles and nerves are left intact. The affected breast, skin, and axillary lymph nodes are completely removed. The surgical incision extends from mid-chest to axilla. A carbon dioxide laser is now more commonly used to create the incision. The advantages of laser surgery are less blood loss and better postoperative recovery.

Axillary dissection

Axillary dissection is done at the time of lumpectomy or mastectomy after biopsy has revealed invasive breast cancer. In some cases, a lumpectomy is done to obtain a diagnosis, then axillary dissection is performed one to two weeks later.

This procedure involves the removal of tissue within the anatomical boundaries of the axilla. The exact number of nodes will be identified by the pathologist; normally, about 6 to 15 nodes are removed. A complete dissection is not done, because it increases the risk of lymphedema.

After axillary dissection, numbness may occur in the area of surgery and along the inner arm within a rectangle from armpit to elbow. Other sensations include: numbness and tingling, burning pain, and heaviness. Most of these symptoms resolve within a year postoperatively. [4]

Breast conservation surgery

Lumpectomy and axillary dissection followed by radiation therapy is as effective as mastectomy in most cases. Exceptions include the presence of breast cancer in several areas in the breast, prior radiation to the chest area, first or second trimester of pregnancy, and a history of collagen vascular disease. Other factors that would potentially prevent a patient from selecting breast conservation therapy are access to a radiation therapy center,

a large tumor in a small breast that would compromise the cosmetic outcome of surgery, and a large breast size that could influence delivery of the radiation dose.[7]

Geography influences the choice of surgery. More breast conservation therapy is done on the East and West coasts, while more mastectomies are performed in the central part of the United States.[4]

Because the choice is a personal one for women, nurses need to educate them about the different treatment options that are available, procedures during treatment, the recovery process, complications, risks, and how the treatment will affect their quality of life. Nurses should also direct teaching to the patient's husband or significant other.

Postoperative care

After mastectomy or lumpectomy with axillary dissection, the patient returns from the PACU as soon as vital signs are normal and there is no evidence of complications. The immediate postoperative focus is on maintaining stability and comfort. Vital signs are taken frequently and dressings are assessed for bleeding. Usually one or two Jackson-Pratt drains are attached under the skin flaps to collect any fluid that would delay healing. Drainage ranges from serosanguinous to serous.

The nurse will teach the patient and family how to empty the drain and record drainage. The application of a drainage bulb holder will secure the drainage bulbs and help prevent accidental tube dislodgement. Commercially available holder with Velcro closures will simplify the procedure of emptying the bulbs. Drainage bulb holder (Dale Medical) can accommodate up to 4 bulbs and can be worn throughout the recovery period.

When the drainage is less than 25-30 cc/ day, the drain will be removed. The axillary drain is usually removed in 1 to 2 weeks, but it could remain longer. The head of the bed should be elevated at least 30 degrees to help to promote drainage. The affected arm is elevated on a pillow while the patient is awake. Keeping the arm elevated will help to promote drainage until collateral lymph channels develop. The patient should have pneumatic compression on her lower extremities while bedridden. Postoperative activities, such as coughing, turning, deep breathing, and incentive spirometry, are followed until the patient is mobile. An abdominal binder with Velcro closure may be prescribed to help encourage coughing, turning, and deep breathing while splinting the diaphragm for the patient. Basic comfort measures, such as turning and repositioning, are done as needed. Pain needs to be assessed and managed on a regular basis.[8]

Nurses can refer women to the American Cancer Society's Reach to Recovery program before surgery or postoperatively. A Reach to Recovery volunteer who has had the same surgery will serve as her peer counselor.

Women are instructed that a permanent prosthesis can be purchased several weeks after surgery, when the mastectomy incision has healed. The prosthesis is a breast form that fits in or is attached to the chest wall, a bra, bathing suit, or lingerie. The store where a

patient purchases the prosthesis should employ a trained fitter. Medicare and most insurance will reimburse the cost of a prosthesis with a note from the doctor.

Care of incisions after discharge

Usually the surgeon will remove the dressings before the patient is discharged. The patient should be instructed how to care for the incision. If she is allowed to shower, she will use a Jackson-Pratt drain pouch to keep the drain from accidentally pulling out. During bathing, the drain bulb will float in the tub. Advise the patient not to panic if the drain pulls out. Instruct her to place a gauze dressing over the site and call her surgeon's office for more instructions.

Advise the patient to call the surgeon immediately if:

- her temperature is over 101°F.
- the incision starts to bleed. If bleeding is persistent, she must go directly to the emergency room.
- the incision suddenly becomes hot, red, tender, or drains pus.[9]

Postoperative arm exercises will help to develop collateral lymphatic channels. If the patient remains overnight in hospital, she will have a visit from physical therapy to review the exercises. If she goes home on the day of the procedure, the nurse will review the exercises with her and her family.

Exercises that use the hand and forearm are introduced on the day of surgery and first postoperative day. Day one exercises continue on day two, but range of motion is slightly increased. The patient is instructed to touch the opposite shoulder, touch the opposite knee, comb her hair, and reach for the small of the back with the affected arm. On day three, range of motion exercises are further increased. The goal is for the patient to be able to fully extend her arm after several days. Exercises from days one and two continue, and other exercises, such as pendulum, jump rope, back scratch, wall climbing, clasp, reach, and spread, and overhead pulley exercises are added. If the patient has difficulty in progressing, she is referred to outpatient physical therapy.

Hand and arm care

To avoid cuts, scratches, irritations, and burns, advise patients to:

- use cuticle cream instead of scissors when cutting nails.
- wear a thimble for sewing.
- use non-irritating deodorants or perfumes.
- use insect repellant when outdoors.
- use rubber gloves for washing dishes and handling harsh cleansers.
- use an electric razor for underarm shaving.
- wear gloves and long sleeves for gardening.
- use a long, padded glove when reaching into a hot oven or barbecue.

- use sunscreen to prevent sunburn.

Web Sites
American Cancer Society: http://www.cancer.org/ This site describes the different types of cancer, while discussing methods of prevention and treatment. It includes recent news about clinical trials and research. It also contains statistical information.
Breast Cancer Info.com: http://www.breastcancerinfo.com/ This site contains information about upcoming events related to breast cancer, and it has updates on the latest professional conferences. It has information about treatments and research studies.
Cancer Information Network: http://www.cancernetwork.com/ This site provides information for health-care professionals, patients, and the families of patients. It includes general descriptions of the different types of patient information.
Cancer Survivors Network: http://www.cancersurvivorsnetwork.org/ Run by the American Cancer Society, this network is a means by which cancer survivors can communicate. The site contains personal stories, and it addresses the future for cancer survivors.
Susan G. Komen Foundation: http://www.komen.org/ This site has detailed information on breast health services, including the education, research, clinical, and breast cancer screening programs of the Susan G. Komen Breast Cancer Foundation.
Living Beyond Breast Cancer: http://www.bbc.org/ This site includes educational materials and updates about special events relating to breast cancer. It also has links related specifically to breast cancer.
National Cancer Institute (NCI): http://www.nci.nih.gov/ This site contains announcements about upcoming events and research programs. It provides information about managing both the physical and emotional effects of cancer.
Y-ME Breast Cancer Organization: http://www.y-me.org/ This site contains general breast cancer information. There is also a special section addressing breast cancer in men.

To minimize binding or constricting, advise patients to:

- avoid tight jewelry or clothing
- avoid blood drawing, injections, or IVs on the side of surgery
- carry a purse on the unaffected side
- ask that blood pressure be taken on the unaffected arm [9]

Postoperative complications

About one-third of women who undergo axillary lymph node dissection develop lymphedema in the affected arm. Surgery, radiation therapy, and infection are all contributing factors in its development.

Lymphedema occurs when lymph nodes and vessels are damaged during treatment. Lymphatic flow is impeded, then fluid accumulates in the soft tissue around the axillary dissection site and may extend into the arm. Once lymphedema develops, it can be managed but cannot be cured. Lymphedema may develop weeks, months, or years after the initial surgery.

Nurses should obtain a baseline measurement of the affected arm before surgery, six weeks postoperatively, and any time that swelling occurs. Patients should be instructed to report a difference between the two arms, such as a heaviness or a change in how clothes fit.

Interventions for all women who experience lymphedema include elevation, reduction in salt intake, massage, mild exercise, avoidance of heat or trauma, and elastic support. An intermittent sequential pneumatic compression sleeve is needed for moderate to severe lymphedema.

Physical discomfort is only one component of the lymphedema experience. Women may need ongoing support to cope with this chronic problem. A multidisciplinary team should be available, including physical therapy, occupational therapy, social work, and counselors.[10]

Breast reconstruction

Reconstruction can be done at the time of mastectomy or any time afterwards. Options for breast reconstruction should be discussed before surgery. There are two types of breast reconstruction: breast implant or tram flap. Both procedures are done by a plastic surgeon.

Breast implants

The saline-filled breast implant is used to create a breast mound that looks similar to a natural breast. The saline-filled shell is implanted in the chest muscle. A nipple can be reconstructed after the implant procedure is completed. The silicone-filled breast implant is only available through controlled clinical trials because of safety concerns.

A tissue expander is used if there is not enough skin and chest muscle to cover an implant. A tissue expander is an empty saline shell that is injected with saline once weekly through a metal port. This procedure gradually stretches the muscle and tissue. When expansion is complete, a permanent breast implant is placed.

Women need to be told that a saline implant is similar to a natural breast but does not have exactly the same look or feel. Surgery is sometimes needed to match the remaining breast with the breast implant.

Tram flaps

The tram flap (transverse rectus abdominis myocutaneous flap) involves abdominal surgery. A breast is reconstructed from abdominal muscle, fat, and skin. It feels more like a normal breast, because the patient's own tissue is used. A flap of skin and muscle from the lower abdomen is attached to one of the rectus muscles in the abdomen. A tunnel is made under the skin from the abdomen to the mastectomy site. The skin flap, fat, and muscle are pulled through the mastectomy incision, then formed into the shape of a breast.

The patient has a nasogastric tube postoperatively. Several Jackson-Pratt drains are in place. Pain control is often managed with PCA morphine for the first few postoperative days. The patient is typically hospitalized from 3 to 5 days. Arm exercises are usually delayed until the flap has healed. Coughing, turning, deep breathing, incentive spirometry, and pneumatic compression stockings are used postoperatively, until the patient is ambulatory.

A nipple and areola will be created after the initial surgery had healed. The formed breast may need further adjustments. A post-surgical bra that provides light compression may be applied to hold surgical dressings in place without the need for tape or ace bandages. Overall, the cosmetic outcome of tramflap reconstruction is very good.

Breast cancer is a challenging disease for patients and their families. Nurses must stay informed about new surgical techniques for diagnosing or treating breast cancer in order to continue to provide information and support throughout the perioperative experience.

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Cathy Fortenbaugh, AOCN, CSN, MSN, BSC, is an Oncology Clinical Nurse Specialist for a 42- bed medical/surgical oncology unit at Pennsylvania Hospital, Philadelphia, PA. She is Chair of the Nursing Research Council and a member of the Hospital Research Review Committee, Hospital Ethics Committee, and University of Pennsylvania Health System Nursing Research Committee. Cathy acts as an oncology consultant to hospital staff, peers and the community.