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Management of Common Breast Problems 2013 - 2014

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Objectives

1. To develop a differential diagnosis and a management plan for a woman with a palpable breast mass.
2. To develop a management plan for a woman with an abnormal screening mammogram.
3. To develop a management plan for a woman with a nipple discharge.
4. To develop a management plan for a woman with a swollen, tender breast.
5. To understand the role of imaging, fine needle aspiration, core needle biopsy, and surgical biopsy in the evaluation of a woman with a breast complaint.
6. To understand the staging system for breast cancer, the surgical options for treatment, the role of radiation therapy, and the role of adjuvant systemic therapy.
7. To understand the current guidelines for breast cancer screening and the management options for "high-risk" women.

Case 1

Palpable breast mass in a 25-year-old woman (cysts and fibroadenomas). A 25-year-old woman presents with a 2-cm discrete, palpable, smooth movable mass that developed 2 months ago. The mass is slightly tender. The patient thinks that the mass is larger and more tender during the days prior to menstruation.

Case 2

Palpable breast mass in a 44-year–old woman (fibrocystic condition). A 44-year-old woman presented to her gynecologist with a breast mass. It has been present for several months. It is occasionally tender, particularly prior to her menstrual period. Examination reveals diffuse, bilateral tenderness. There is no dominant mass, but there is a definite thickening in one area that stands out. Her breasts feel "lumpy" throughout.

Case 3

Palpable breast mass in a 57-year-old woman (early stage breast cancer). A 57-year-old woman noticed a mass in her breast three months ago. It felt hard. Examination revealed a mass about 2 cm in diameter with no skin changes. The mass was hard, but it moved freely with respect to the chest wall. The remainder of her physical exam was unremarkable. There was no axillary or supraclavicular lymphadenopathy. Screening mammography the year before was normal, but a mammogram now shows an irregular, spiculated mass corresponding to the palpable lesion. No other abnormalities are imaged.

Case 4

A red swollen breast in a 38-year-old woman (breast abscess vs. locally advanced breast cancer). A 38-year-old woman noticed a tender, painful area in her left breast. She is 6 months post-partum and is breast feeding her child. Her gynecologist prescribed dicloxacillin, which initially improved her symptoms, but now they are worse. Examination reveals a swollen, pink breast with some skin edema.

Case 5

Abnormal mammogram (ductal carcinoma-in-situ, DCIS). A 54-year-old woman has a screening mammogram. She is called back for additional diagnostic views and told she has suspicious microcalcifications. A biopsy is recommended. Physical exam reveals no abnormality. Last year's mammogram is normal.

Case 6

Nipple discharge (papilloma vs. malignancy). A 59-year-old woman is undergoing annual breast cancer screening. Bilateral mammograms are normal. Squeezing of the right nipple expresses 3 drops of blood from a single duct at 11 o'clock. No masses are palpated. The patient states that she has noted small blood stains on her nightgown on 4 occasions over the past 3 months.

Case 7

The high-risk woman (atypical hyperplasia and lobular carcinoma-in-situ). A 49-year-old woman presents with suspicious microcalcifications. Her physical examination is normal. She has a 53-year-old sister with breast cancer. She undergoes a wire localized excisional biopsy that reveals atypical ductal hyperplasia.

Introduction

The discovery of a new breast complaint is an extremely upsetting event for most women. The possibility that the new complaint represents breast cancer is foremost in their minds. Anxiety concerning disfigurement, severe illness, and the possibility of a fatal illness must be acknowledged and dealt with in an empathic manner by the patient's physician.

Almost always, a surgeon is consulted as the initial step in patient evaluation. The surgeon must evaluate the patient appropriately and develop a management plan. The majority of patients with a breast complaint do not have cancer. The primary goal in breast evaluation is to decide if further evaluation is needed based on initial findings. A final diagnosis does not need to be made at the initial visit. Normal physiologic variations related to hormonal cycling or benign breast conditions require patient education and reassurance. Occasionally simple symptom based interventions are required. Findings that are clearly benign may require periodic re-examination but may not require any further evaluation or treatment.

A surgeon also must evaluate findings that are possibly malignant. Treatment options often are complex and involve physicians from multiple disciplines. The surgeon should be an expert in the surgical management of breast cancer. The breast surgeon also should be prepared to act as the coordinator of initial and follow-up care.

The evaluation and management of patients with breast complaints and breast cancer are aided by a large body of evidence that has been derived from well-designed clinical trials conducted over the last few decades. While there are areas of legitimate disagreement among experts, there are many areas for which Level I evidence is available to guide patient management.

General Evaluation

The two most common breast complaints are a palpable mass and an abnormal mammogram. These two entities, along with nipple discharge and a swollen, tender breast, represent almost all of the patient scenarios that a surgeon is likely to encounter (Table 1).

The surgeon must take an appropriate history focused on the complaint. The duration of the complaint is important to note as well as any fluctuation of the complaint with the monthly menstrual cycle. The surgeon should inquire about the presence of breast pain and the nature of any nipple discharge. An evaluation of risk factors for breast cancer is important. The primary risk factors are increasing age and family history. The surgeon should specifically inquire about breast and ovarian cancer in the patient's family. Risk factors related to menstrual history and childbearing are thought to represent the risk of exposure to endogenous estrogen. Although family history is important, one must remember that the majority of breast cancer patients do not have a family history of breast cancer.

Physical examination of the breast, axillary and supraclavicular areas is mandatory. The surgeon should inspect the breast for any skin changes or retraction. Palpation should be thorough and performed in a relaxed, unhurried manner. The examination must be performed efficiently and with respect for the patient. A general examination of the patient focused on the lungs, chest wall and abdomen also must be performed.

The surgeon personally should review any mammograms and ultrasound examinations if possible. Insist upon original films. If available, several years of images should be compared side by side in order to appreciate any subtle changes over time. Digital films are often available, and the surgeon must have appropriate software and hardware for viewing digital images at appropriate resolution. Increasingly, breast MRI is being used to evaluate asymmetric densities on mammography or to further evaluate

women with extremely dense breasts. Studies are currently ongoing to define the exact population of women who should have screening and/or diagnostic breast MRI.

The surgeon should be familiar with various diagnostic interventions that can be performed in the office. These include fine needle aspiration (FNA) of breast cysts and breast masses, the proper handling of cytology specimens, and the appropriate use of core needle biopsy.

Once the evaluation is completed, most patients can be classified as having findings that are clearly benign, probably benign or that are suspicious. Patients with findings that are clearly benign can return to routine screening. Patients with findings that are probably benign should be followed with a repeat clinical examination or repeat imaging in several months to half a year. Clinical follow-up must be active. The patient should not leave the office without making a definite follow-up appointment. Patients with suspicious findings require further evaluation. Tissue diagnosis is usually required. The surgeon must be expert in the various techniques available for breast biopsy (Table 2).

The case scenarios presented at the start of this chapter and discussed in the text that follows will illustrate the evaluation and management of patients with the common breast complaints. In addition, diagnostic techniques, the treatment of breast cancer, breast screening, and the evaluation of "high-risk" women will be discussed.

Case 1 (a palpable breast mass in a younger woman)

The patient in Case 1 has a finding that is probably benign. Breast cancer before the age of 30 is rare. The primary differential is to determine if this lesion is a cyst or if it is a solid mass. Cysts are benign, fluid-filled lesions. In this age group, the most likely

solid mass would be a fibroadenoma. Fibroadenomas represent a benign hyperplastic process. Fibroadenomas usually are single, but 10 – 20 % are multiple. Other benign possibilities include juvenile fibroadenomas, hamartomas, lipomas and fat necrosis. The possibility that this is a phyllodes tumor and the remote possibility that this represents breast cancer must be considered. The history and physical exam certainly suggest a cyst.

There are two appropriate management options for this patient. Fine needle aspiration of the mass with a 23-gauge needle may result in the removal of cyst fluid, with resolution of the mass. If classic cyst fluid without any gross blood is obtained, it may be discarded, provided that the mass resolves completely. The patient should be scheduled for follow-up examination in two to three months. If the aspirate is bloody, the fluid should be sent for cytological evaluation. A persistent mass after aspiration suggests a solid lesion, and the aspirated fluid should be sent for analysis as well. If no fluid is obtained, the needle may be passed through the lesion several times, and the resulting cellular material should be sent for cytological evaluation. The surgeon must ensure that the appropriate fixative is available. In many multi-disciplinary breast centers, on-site cytological evaluation is available to assess adequacy of the sample and provide a quick diagnosis.

The other alternative for this patient involves ultrasound examination of the affected breast. The finding of a simple cyst with a smooth wall, no cystic debris, and good through transmission of ultrasound establishes the diagnosis of a simple cyst. No further evaluation or follow-up is needed. If desired and if the cyst is tender or enlarges in the future, aspiration then can be performed. The finding of septations, mural nodules, or intra-cystic debris characterizes the cyst as a complex cyst. Further evaluation with

aspiration and cytological evaluation is required, since 0.3% of complex cysts are associated with malignancy. The finding of a smooth, homogeneous mass consistent with a fibroadenoma may be managed in several ways. In a young patient under thirty with physical exam findings as described and an ultrasound image consistent with a fibroadenoma, observation is usually appropriate. Repeat clinical and ultrasound evaluation at six-month intervals for a year or two is suggested. The patient should be instructed to contact the surgeon if the mass appears larger during monthly breast self exam (BSE). If the mass changes, biopsy is required. For patients over the age of 30, fine needle aspiration of the solid mass is recommended. Cytological findings consistent with a fibroadenoma combined with benign clinical and imaging characteristics constitute a negative “triple test" (Table 3). These patients may be safely observed with excision reserved for masses that grow. The finding of an irregular, heterogeneous mass on ultrasound mandates tissue diagnosis. If FNA of a palpable mass is bloody or the mass does not resolve, tissue diagnosis is required. Breast cancer is rare in women between the ages of 20 and 30. In a study of 951 breast biopsies performed on young women, no patients under age 21 were found to have breast. However, 1.3% of biopsies in women age 21 - 25 and 4.0% of biopsies in women age 26 - 30 were positive for malignancy. Image-guided core biopsy and excisional biopsy represent two equivalent options with regards to accuracy, with core biopsy being simpler and less traumatic.. Core biopsy guided by palpation alone may result in a false negative result due to sampling error. The most important pitfall in observing a solid mass in any woman is the risk of missing a cancer.

Case 2 (a palpable breast mass in a middle-aged woman)

This patient's evaluation is more complex then the previous case. Her physical exam shows an abnormality that does not have typically benign characteristics. The examination is made more difficult by her lumpy breasts. The incidence of breast cancer begins to rise after age 40, and this patient could very well have a malignancy. The surgeon must prove that she does not. The patient had a mammogram performed that revealed dense breast tissue but no mass. A negative mammogram does not rule out the presence of breast cancer. An ultrasound also was negative. In this setting, the patient must be assumed to have a solid mass. Fine needle aspiration with cytological interpretation is the next step. However, in this case, the cytology report revealed blood and fat but no specific diagnosis could be made. This patient now needs a tissue diagnosis. The surgeon may perform core needle biopsy provided that the mass is clearly entered by the core needle, adequate tissue is obtained and follow-up is arranged. An excisional biopsy performed as an outpatient is an appropriate choice. This patient's excisional biopsy revealed sclerosing adenosis.

The term "fibrocystic condition" is an imprecise term that describes a clinically diagnosed entity that is a manifestation of physiologic responses of breast tissue to normal hormonal cycles. The patient often has breasts that are painful, particularly prior to her menses. She has lumps that come and go. Her mammogram often shows a pattern of dense breast tissue. It probably is more useful to describe benign breast disease in terms of a three-tiered pathologic classification that can be used to assess a patient's risk of future breast cancer development, particularly when family history is factored in . Lesions are classified as non-proliferative, proliferative without atypia, and atypical

hyperplasia (including Lobular Carcinoma-In-Situ or LCIS) (Table 4). Several retrospective and case-control studies show no increased risk of developing breast cancer with non-proliferative lesions and a small relative risk (RR < 2.0) with proliferative lesions without atypia. Family history does modify the risk factors for the proliferative lesions slightly (RR 2.0 – 3.0). Patients with the non-proliferative lesions and low risk proliferative lesions require routine breast screening. Patients with the higher risk atypical hyperplasia require special surveillance and possibly preventative therapy. This will be discussed in more detail in a later section.

Case 3 (early stage breast cancer)

This patient with a palpable mass and a suspicious mammogram almost certainly has breast cancer. Clinically it appears to be localized to her breast. Fine needle aspiration was performed with a result revealing adenocarcinoma. Core needle biopsy could also be performed. Excisional biopsy is not the first choice since it mandates a second operation if malignancy is found. The surgeon next must perform some basic studies to determine the stage of her cancer. A chest radiograph and basic blood work (CBC, liver function tests) are all that are usually required. If these are normal, there is no role for CT scan or bone scan for patients with clinical early stage breast cancer. The patient, in consultation with her surgeon, must now choose among the treatment options.

In the early 20th century Halsted model of breast cancer, an orderly, predictable, lymphatic spread of breast cancer subsequently would give rise to systemic disease. Therapy was designed to encompass the tumor and "get it all out." The radical mastectomy was designed to remove the breast, all axillary nodes, and the pectoral muscles. A fair number of patients with early stage breast cancer were cured with this

procedure. However, well-designed, prospective clinical studies in the latter part of the 20th century demonstrated that breast cancer dissemination was often capricious and hematogenous. In the modern model of breast cancer, patients with clinically and pathologically negative nodes in fact already could have metastatic disease at the time of presentation. There are three major implications of the acceptance of this hypothesis:

1) Breast cancer spreads capriciously and may do so at any time. Early detection is life saving. Early detection can increase the number of breast cancers identified and treated at a truly early stage, before potentially lethal micrometastases has occurred.

2) Women die from breast cancer because of metastatic disease, not from the effects of local or regional tumor. Thus, the method of local control does not impact upon survival. Lumpectomy with radiation is equivalent to mastectomy with regards to patient survival. This has been demonstrated in over half a dozen prospective clinical trials. The objectives of local control are to eliminate a tumor from the breast and chest wall that ultimately may become symptomatic by eroding, fungating, or bleeding and to remove a tumor that potentially may metastasize. Similarly, the method chosen to achieve regional control (axillary lymph node dissection, radiation therapy) does not impact upon survival. The method of regional control should be chosen to maximize the amount of staging information obtained while minimizing patient risk and inconvenience.

3) Systemic metastases are the cause of breast cancer deaths. Systemic therapy (tamoxifen, chemotherapy) is potentially life saving. Systemic therapy should be considered in all women whose breast cancers are at significant risk of disseminating. The roles of clinical staging and analysis of prognostic factors are to identify which tumors are and which tumors are not at significant risk for having associated micrometastases.

This patient may achieve local control of her tumor with either lumpectomy (aka partial mastectomy) and radiation or with mastectomy. There are several factors relevant to the choice of breast conservation vs. mastectomy for the initial treatment of early breast cancer (Table 5). Patient preference for breast conservation, tumor size, and tumor location favorable for a good aesthetic result are important factors. The patient should have a single tumor and should not have a contra-indication to radiation (pregnancy, previous radiation to the area, certain collagen vascular diseases). The patient should be willing to come for follow-up. Anticipated difficulty with future mammography due to suspicious areas is a relative contraindication to conservation. Patient preference should be a major factor in choosing local treatment or mastectomy because, in most instances, the options are therapeutically equivalent. Radiation therapy usually is given after lumpectomy because it reduces the in-breast recurrence rate (and therefore improves the ultimate success rate with breast conservation) approximately four-fold. Newer studies suggest that accelerated partial breast radiation therapy may be an option for selected patients. This may be delivered with external beam techniques or balloon catheter brachytherapy techniques.

Breast reconstruction is an appropriate option for most women undergoing mastectomy and should be discussed with all women in whom mastectomy is considered. Immediate reconstruction almost always is feasible. Delayed reconstruction may be best for those women who are not certain of their preference for reconstruction and for those in whom the need for post-mastectomy radiation therapy is likely. Prosthetic reconstruction with an implant generally is less physiologically stressful and less technically demanding. Autogenous reconstruction is generally more complex but usually has better final aesthetic results. Options include TRAM flap, latissimus dorsi flap or newer free tissue transfer techniques (DIEP flap). Combinations of tissue flaps and expanders or implants are also used. Skin sparing mastectomy techniques can improve post operative appearance without compromising patient outcome for early stage breast cancer. Nipple and areolar sparing mastectomy is being offered with increasing frequency to selected patients.

In the past, axillary nodes were removed from the lower levels of the axilla. When performed at the time of lumpectomy, a separate incision was made in the axilla. When combined with mastectomy the procedure was termed a modified radical mastectomy; the pectoral muscle is not removed as in the Halsted radical mastectomy. A typical axillary dissection will remove about a dozen nodes. The axillary dissection itself does not directly change survival, but it is instead a staging technique that allows for the rational selection of adjuvant systemic therapy.

Sentinel lymph node mapping and biopsy has eliminated the need for axillary dissection in the modern management of patients with clinically negative nodes. In this technique, a tracer (blue dye and/or Tc-99 labeled sulfur colloid) is injected into the

breast. The tracer travels to the first draining axillary lymph node and is detected visually or with a hand-held gamma probe. That node is removed and tested. If it is free of cancer, the remainder of the axilla is presumed to be negative, and axillary dissection with its occasional side effects of lymphedema and frozen shoulder can be avoided. Patients with positive sentinel nodes previously would have an immediate axillary dissection. Recent data from the prospective trial ACOSOG Z011 have now demonstrated that with appropriate adjuvant systemic and radiation therapy, axillary node dissection does not improve survival or local control in many women with a small number of positive sentinel nodes. Axillary dissection is now applied selectively and usually after final pathology reports are available.

The presence or absence of node metastases allows the patient to be stratified by cancer stage (Tables 6, 7, 8, 9). Based on the cancer stage, appropriate adjuvant therapy can be selected for patients. The 7th edition of the AJCC staging system is effective as of 2009. The 7th edition differs from the previous system (which had first introduced the role of sentinel node biopsy) mainly in the consideration of microscopic sentinel lymph node biopsy results. Prognostic factors help differentiate those patients who are at high risk of developing metastatic disease subsequent to their initial local-regional breast cancer treatment from those who are at low risk. Patients who fall into the high-risk groups benefit from systemic adjuvant therapy, whereas the risks of systemic therapy usually outweigh the benefits in low risk patients. The three prognostic factors that have been proven most useful in prospective, randomized trials of women with breast cancer are tumor size, axillary lymph node status, and estrogen receptor status. Her-2-neu status now is routinely measured at most centers due to the availability of Her-2 targeted

therapies. The recent introduction of multi-gene assays (Oncotype DX, Mammaprint and others) has further allowed adjuvant treatment recommendations to be tailored to the individual tumor genetic characteristics.

Multiple clinical trials are available to help guide adjuvant treatment decision-making. The current standard is constantly changing. Current guidelines available from several sources represent general consensus from national experts based on the best available levels of evidence. There are honest differences of opinion concerning the appropriateness of current guidelines for individual patients. In the past, almost all node-positive patients and most node-negative patients with larger tumors required adjuvant therapy. Patients with smaller tumors but with adverse characteristics would also be considered for systemic therapy. Newer genetic tumor profile tests such as the 21 gene panel (Oncotype®) and the 70 gene panel (Mammaprint®) are being increasingly used to make individualized patient treatment decisions, allowing patients who would not benefit from systemic chemotherapy to avoid the toxicity. The type of systemic therapy varies, but it includes several different chemotherapy regimens, the hormonal agents tamoxifen, anastrozole and letrozole as well as biologic agents such as trastuzamab. The NCCN website contains current treatment recommendations (www.nccn.org).

Case 4 (a woman with a red, swollen breast)

This patient most likely has a breast abscess that almost always is associated with lactation and infection by skin organisms. If given early in the development of breast infection, antibiotics can prevent abscess formation. In this patient, the antibiotics decreased some of the inflammation from the surrounding cellulitis but they could not penetrate into the abscess cavity that had already formed. An ultrasound is an excellent

first test for evaluating this patient. If it reveals an irregular cavity, percutaneous drainage can be performed and antibiotics would be continued. Often, this needs to be repeated every several days, but most cases will usually resolve. Occasionally, open surgical drainage is required.

The physician needs to be concerned about the possibility of locally advanced breast cancer in any patient with a red or swollen breast. Locally advanced breast cancer is considered operable or inoperable based on clinical characteristics. Pre-surgical systemic treatment is required for patients with Stage IIIB inoperable disease and should be strongly considered for patients with Stage IIIA operable disease. The concept of operable vs. inoperable breast cancer was originally described decades ago. Patients with extensive breast edema, inflammatory cancer, skin satellites, arm edema, parasternal and/or supraclavicular nodes always suffered recurrence when treated with surgery alone. Other grave signs include fixation to the chest wall, fixed nodes, large nodes, skin ulceration, or limited breast edema. Patients with these findings today are considered to have inoperable Stage IIIB or IIIC breast cancer. Patients with Stage IIIA disease are operable (albeit usually with mastectomy) but are still considered to have locally advanced breast cancer.

Neoadjuvant (pre-operative or induction) therapy in Stage III disease can produce response rates of 75% or greater. This has become the standard approach for patients with Stage IIIB breast cancer. Following successful induction therapy, mastectomy and radiation are used. Survival rates are improved compared to a "surgery-first" approach and local control rates are between 70 and 80%. For patients with operable Stage IIIA breast cancer, a modified radical mastectomy followed by post-operative adjuvant

therapy and post-mastectomy radiation is a reasonable approach. An alternative is pre-operative chemotherapy with possible "down-staging" of the tumor and subsequent lumpectomy with radiation. In Stage IIIA breast cancer, the use of adjuvant therapy increases breast conservation rates. Survival is the same as post-operative systemic therapy. Negative aspects of pre-operative therapy include the potential loss of accurate staging information from "down-staging" of axillary nodes.

In addition, numerous reports have appeared concerning breast conserving surgery following induction chemotherapy in patients with early stage (I and II) breast cancer. Response rates up to 80% are seen and many patients who would require mastectomy can be treated adequately with breast conservation.

Case 5 (ductal carcinoma-in-situ, DCIS)

This patient with suspicious microcalcifications will require a biopsy. The most likely malignant finding is DCIS although she may have benign microcalcifications. Screening mammography has been shown to decrease death from breast cancer in screened populations. The American Cancer Society along with many other organizations recommend mammography beginning at age 40 for all women. Other organizations including the US Preventive Services Taskforce, recommend that screening begin at age 50. This should be combined with annual physician exam and breast self awareness (formerly BSE). A screening mammogram is obtained on asymptomatic women. They are batch read by a radiologist. The radiologist must decide if they are normal or abnormal. Less then 10% of screening mammograms would be expected to be abnormal. The patients with abnormal mammograms then are recalled for diagnostic mammography. Diagnostic mammography is performed with the radiologist on site in

order to direct the work-up. Additional views and special techniques such as spot-compression or magnification will be used. Ultrasound will be obtained to evaluate mammographic masses to distinguish solid masses from fluid filled cysts. Increasingly, breast MRI is used to evaluate masses and densities seen on mammography. At the completion of the diagnostic imaging session, the radiologist will classify the mammogram according to the American College of Radiology's Breast Imaging Reporting and Database System (BIRADS©). The report classifies the mammogram and provides clear recommendations to treating physicians (Table 10). Spiculated masses, solid masses, and indeterminate microcalcifications on mammography should be considered suspicious and almost always require biopsy.

Microcalcifications can appear benign or may represent malignancy. Microcalcifications that are clustered with numerous pleomorphic or linear forms often can represent ductal carcinoma-in-situ (DCIS). This is the earliest form of breast cancer and is about 98 – 99% curable with appropriate treatment. This patient needs to have a biopsy. Because the abnormality cannot be felt, an image must be used to guide the biopsy. Traditionally, wire localized excisional biopsy has been performed. Approximately 75% of such patients will have a benign biopsy. This has led to interest in less invasive biopsy techniques. Stereotactic percutaneous biopsy with a large bore core needles or a vacuum-assisted devices has demonstrated accuracy equivalent to open biopsy in most patients. This patient underwent a vacuum-assisted core biopsy with a result revealing intermediate grade DCIS.

The current standard for treatment of DCIS in patients desiring breast conservation is lumpectomy with clean margins followed by radiation. If a patient desires

mastectomy or there are contraindications to breast conservation, simple mastectomy (without axillary node dissection) may be performed. Several prospective trials clearly show a benefit to the addition of radiation therapy and systemic tamoxifen to lumpectomy. Survival is the same with either technique, but in-breast tumor recurrence (both recurrent DCIS and invasive breast cancer) is decreased with the addition of radiation and tamoxifen.

The patient in this scenario underwent wire-localized lumpectomy. The final pathology revealed DCIS with a diameter of 7 mm. The patient had a clear margin greater then 10-mm in all directions. While radiation would be considered standard in most patients, there is retrospective (Level II) data as well as early prospective data available to support lumpectomy alone in selected patients with DCIS. Several classification systems are available to select patients who might safely skip radiation, most notably the Modified Van Nuys Prognostic Index. This patient has a small tumor with a wide margin around it, and lumpectomy alone would be a reasonable alternative to lumpectomy with radiation. She chose to have radiation, the treatment supported by Level I evidence. She can expect about a 10% chance of in-breast tumor recurrence at ten years. If this occurs, she will need a simple mastectomy at that time. Regular follow-up with mammography every 6 to 12 months is essential for this patient.

With the increasing use of screening mammography, many women with very small areas of low grade DCIS are being identified. There has been increasing concern in the public health community that a significant number of women are being overdiagnosed with DCIS and receiving treatment for a condition which will not progress during their natural lifespan. This problem may compounded by the increasing use of US and MRI in

routine screening. These tests are sensitive for the detection of breast cancer but are relatively non-specific, having high false positive rates.

Case 6 (papilloma vs. malignancy)

The patient with the bloody nipple discharge might have breast cancer although benign illnesses can also cause bloody discharge. The evaluation of women who present with nipple discharge is determined by the nature of the discharge. A milky discharge can be physiologic, secondary to numerous medications that affect prolactin, or due to pathologic conditions such as a pituitary tumor or ectopic prolactin production. Approximately one third of women who have lactated can express breast secretions. Management by duct excision is indicated if the discharge is bothersome. A "fibrocystic discharge" is often brown, green, or black and usually is associated with duct ectasia or fibrocystic breasts. Fibrocystic discharge can also be treated by duct excision if bothersome.

In bloody discharges, malignancy is a concern. Clinical evaluation should be directed toward identifying palpable or mammographic lesions. Cytological evaluation of nipple discharge has questionable usefulness, since decisions concerning surgery are made on clinical grounds. Likewise, galactography only occasionally is helpful although some feel it helps guide excision. A negative galactogram should not be used as an excuse to avoid surgery when bloody discharge persists. Often, the discharge can be localized to one quadrant of the breast or even one duct, which is useful for guiding terminal duct excision. This is the procedure recommended for this patient. The bloody nature of the discharge, combined with its spontaneous expression on several occasions, raises the level of suspicion of malignancy.

The most common reason for bloody discharge is the presence of a papilloma, accounting for most of cases. Duct ectasia accounts for additional cases of nipple discharge. Cancer is present in 5 to 20% of bloody nipple discharges. Terminal duct excision can be performed as an outpatient using local anesthesia with sedation. A circumareolar incision may be used, and there usually is no need to close the resultant breast cavity. Younger patients who still expect to have children should be warned that interference with successful lactation might result.

Case 7 (atypical hyperplasia and lobular carcinoma-in-situ)

This patient has atypical hyperplasia and a family history of breast cancer. She does not have breast cancer and does not need specific treatment for her atypical hyperplasia. However, she is not a routine patient. She has an increased risk of developing breast cancer based on her pathology findings. This risk is further increased by her family history. This risk can be quantified using a mathematical model developed by Gail. This model takes into account patient current age, age at menarche, age at first live birth, family history, number of previous breast biopsies and any finding of atypical hyperplasia. Her risk of developing breast cancer is approximately 5% over the next five years, with a lifetime risk of about 30%. Atypical ductal hyperplasia represents a condition along the spectrum of breast cancer development. In some cases, even expert breast pathologists find it difficult to distinguish atypical ductal hyperplasia from DCIS.

Lobular carcinoma-in-situ (LCIS) is a high risk condition that does not require treatment but like atypical ductal hyperplasia it is a marker of a greatly increased risk of developing breast cancer. LCIS is usually an incidental finding at the time of biopsy for a palpable or mammographic abnormality. Patients with LCIS need a plan to address this

increased risk. Current consensus recommendations for the patient above would suggest that she be examined at least twice a year, with at least one visit at a specialized breast center. She should continue with annual mammography and may wish to consider the use of screening MRI, recognizing it's relative lack of specificity.. She should consider the use of tamoxifen or raloxifine as a preventative agent. The Tyrer-Cuzick model can be used to estimate the level of risk in women with LCIS.

Other aspects in this patient's history might lead the clinician to consider the possibility that the patient carries a mutation in the BRCA 1 or BRCA 2 gene. If she was younger and there were several affected relatives with breast or ovarian cancer, the patient might wish to consider genetic testing. Carriers of the BRCA gene mutations appear to have a lifetime risk of developing breast cancer of 50 – 80%. Such women may wish to consider prophylactic mastectomy as a treatment option in lieu of increased surveillence. Recommendations for BRCA gene mutation carriers constantly are evolving since new data are released regularly. Currently, the American Cancer Society and the NCCN recommends the addition of annual screening MRI for women who carry a BRCA mutation or untested women who have a family history consistent with hereditary breast and ovarian cancer. The role of MRI screening in women with LCIS or atypical hyperplasia without a family history is evolving. The patient must also make decisions about screening or preventive surgery for her ovarian cancer risk.

Summary

Women who present with a breast complaint usually have a palpable mass, an abnormal mammogram or both. Low suspicion masses in pre-menopausal women may be observed through a menstrual cycle to see if they resolve. Persistent low suspicion masses

require tissue diagnosis. Suspicious masses in a pre-menopausal woman and virtually all palpable masses in post-menopausal women require tissue diagnosis.

Patients with probably benign mammographic abnormalities require short interval imaging follow-up. Suspicious mammographic abnormalities require biopsy. Patients with bloody nipple discharge or a red, swollen breast may have cancer and appropriate evaluation including biopsy is required.

Patients with early stage breast cancer can usually be treated with breast conserving surgery and radiation therapy. Most patients with invasive breast cancer will benefit from systemic adjuvant therapy. Patients with locally advanced breast cancer require multi-modality treatment and are bested served by a multi-disciplinary approach.

Finally, patients with atypical ductal hyperplasia and/or LCIS are at increased risk of future breast cancer and require increased surveillance and/or preventative interventions. Patients with a strong family history (particularly pre-menopausal breast cancer in a mother or sister) should consider genetic testing and increased surveillance.

Table 1

Common Breast Complaints

Palpable mass
Abnormal mammogram
Nipple discharge
Swollen, tender breast

Table 2

Biopsy Techniques

Core needle biopsy, with or without vacuum assist
Image guided core biopsy (stereotactic, US or MRI guided)
Excisional biopsy
Wire localized excisional biopsy
Incisional biopsy (rarely used)

Table 3

The Triple Test

Benign physical exam
Benign image
Diagnostic and benign cytology

Table 4

The Pathologic Classification of Benign Breast Disease

Nonproliferative	Proliferative w/o atypia	Atypical hyperplasias
Cysts	Moderate or florid hyperplasia	Atypical ductal hyperplasia
Mild hyperplasia	Intraductal papilloma	Atypical lobular hyperplasia
Papillary apocrine changes	Sclerosing adenosis	LCIS

Table 5

Factors Favoring Breast Conservation vs. Mastectomy

Factors favoring breast conservation	Factors favoring mastectomy
Small tumor	Large tumor in small breast
Unifocal tumor	Multicentric disease
Negative margins	Positive margin
Able to have radiation	Unable to have radiation
Patient preference	Patient preference.
Committed to followup	Difficulty with follow-up anticipated

Table 6

AJCC T Category

T	Description
Tis	Carcinoma in situ
T1	2 cm or less
T2	> 2 but ≤ 5 cm
T3	Greater then 5 cm
T4	Skin, chest wall involvement, or inflammatory

Table 7

AJCC N and M Categories

N & M	Description
pN0	No node involvement
pN1mic	Tumor in nodes measuring between 0.2 and 2.0 mm
pN1	1 to 3 axillary nodes and/or microscopic IM nodes detected by SLN
pN2	1) 4 to 9 axillary nodes 2) clinically positive IM nodes without any positive axillary nodes
pN3	1) 10 or more axillary nodes 2) any infraclavicular or supraclavicular nodes 3) clinically positive IM nodes with positive axillary nodes 4) microscopic IM nodes with 4 or more axillary nodes
M0	No distant metastases
M1	Distant metastases

Table 8

Early Stage Breast Cancer

Stage	Tumor	Nodes	Metastases
Stage 0	Tis	N0	M0
Stage IA	T1	N0	M0
Stage IB*	T1	N1mic	M0
Stage IIA	T0-1	N1	M0
	T2	N0	M0
Stage IIB	T2	N1mic or N1	M0
	T3	N0	M0

* = new category for 7th edition

Table 9

Locally Advanced Breast Cancer

Stage	Tumor	Nodes	Metastases
Stage IIIA	T0-3	N2	M0
	T3	N1 mic or N1	M0
Stage IIIB	T4	N 0-2	M0
Stage IIIC	Any T	N3	M0
Stage IV	Any T	Any N	M1

Table 10

BIRADS©

Class	Description	Recommendation
Category 1	Normal	Annual follow-up
Category 2	Benign	Annual follow-up
Category 3	Probably benign	Short interval (6 month) follow-up
Category 4	Suspicious	Biopsy recommended
Category 5	Highly suggestive of malignancy	Biopsy mandatory
Category 6	Known cancer (biopsy completed)	Treatment required