

Breast Inflammation: Could It Be Cancer? A Case Presentation

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Case Study: Breast Inflammation: Could It Be Cancer?

**Preliminary Information**

**Selection of Case**

While working in a private practice setting I diagnosed a case of Inflammatory Breast Cancer. I chose to present this case because it is a rare abnormality and I am interested in learning more about inflammatory breast cancer.

**Site**

The site of this case study was a private practice setting located in North Texas.

**Type and Number of Encounters**

Patient J.B. came for a total of four visits over a 6 month period of time.

**Insurance**

J.B. is a private pay patient who has private insurance coverage with affordable copays and coverage for needed care.

**Chief Complaint**

During her second visit, J.B. presented with erythematous area, which was tender to palpation. No underlying mass was detected with palpation. After unsuccessful treatment of non-puerperal mastitis, the patient was sent for further evaluation and diagnosed with inflammatory breast cancer within two weeks of presentation of breast inflammation.

**History of Present Illness**

J.B. is 32-year-old Caucasian G2P1Ab1 who initially reported a tender area on her left breast at 11 o'clock, which was evaluated by diagnostic mammogram and sonogram and results indicated the presence of a benign-appearing, cystic mass measuring 4 mm in left breast. She was reassured and instructed to follow-up in six months for repeat imaging or follow-up if additional problems arise.

Five months later, she returns for redness and right breast pain that has been present for 3-4 days. After thorough examination the health care provider visualized an erythematous area measuring 5cm by 7cm in left breast. She was diagnosed with mastitis that was not associated with pregnancy or breastfeeding and prescribed antibiotics for 10 days and instructed to follow-up in 4-5 days if the signs and symptoms do not resolve with antibiotic treatment.

Five days later S.B. returned to the clinic with worsening signs and symptoms despite antibiotic treatment. Examination revealed an irregular area of tenderness measuring approximately 7cm-10cm. No underlying masses or cervical/axillary lymphadenopathy were palpable on examination. Antibiotic regimen was then changed and she was sent for further evaluation with diagnostic mammogram and sonogram.

She presented three days later for discussion of results of sonogram and mammogram. Examination for this visit shows no improvement in breast despite antibiotic treatment. The patient was then referred to a breast specialist who she saw 48 hours later. A diagnosis of inflammatory breast cancer was made after breast evaluation and biopsy as well as subsequent treatment.

### Past Medical History

- J.B. is a 35 year-old Caucasian G2P1Ab1 who presents for breast evaluation (see History of Present Illness. She reports a negative past medical history. She has had one current partner for three years. She has a tubal ligation and does not take oral contraceptives or daily medications.
- Allergies: No known drug allergies (NKDA).
- Menarche: 12 years old.
- Last Menstrual Period: Menses regular, predictable, and normal 3 weeks ago.

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- Surgical History: Missed abortion at nine weeks gestation requiring D & C in 1999. Vaginal delivery at 38 weeks gestation with no complications.
- Smoking/Drugs: Denies smoking and drug use. She drinks 2-3 drinks about once per month in social gatherings.
- Social History: J.B. is 32 years old and lives with her 3½ year old son in a single family dwelling in large urban city. She has a boyfriend who she has been dating for 3 years. She works full-time as a business professional for a local telecom company. She has a few friends from church and near her home. Her adoptive parents live locally and are supportive. She has two adopted siblings who reside a long distance away, but she remains close to them. Prior to this relationship of 3 years, she was exclusive but reports her partner was not. After an 8 year marriage and infidelity she ended the relationship. She later found out that she was pregnant and has raised the child alone. She reports no contact with the father of her child and he provides no support.
- Family History: J.B. was adopted at birth and does not know her family history.
- Sexual history: J.B. has had one mutually exclusive partner for three years. She has had a tubal ligation since her delivery 3 ½ years ago. She and her partner do not use condoms, but they are mutually exclusive. She reports that she and her partner have not used condoms since becoming mutually exclusive 3 years ago. J.B. reports a history of two previous partners and reports the occasional use of condoms with previous partners. She has had routine screening for sexually transmitted infections and has remained negative. All partners have been male. She denies experiencing pain with intercourse, vaginal discharge, abnormal bleeding, or problems with intercourse.

**Encounter One:****Review of Systems**

- Review of Systems negative except for tender mass palpable in the left breast for a few days. Denies fever or chills or other problems.

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**Physical Examination**

- Vital signs: B/P 120/78, P-80, R-18, T=98.3 (oral).
- General: Healthy female, appears concerned but not in acute pain.
- Weight: 225, Height: 5'4", BMI: 38.7 (obese).
- HEENT: Wears contact lenses or glasses, normal female, no thyromegaly or nodule noted.
- Respiratory: Her bilateral breath sounds clear. No wheezing or shortness of breath noted.
- Cardiovascular: Regular rate and rhythm without murmur.
- Breast Exam: Tanner Stage V, no palpable masses in right breast, left breast approximately 1 cm tender mass located at 11 o'clock 5 cm from areola, no nipple discharge, no palpable lymph nodes.
- Abdomen: Soft and non-tender without masses.
- Extremities: Full range of movement.
- Neurologic/Musculoskeletal: No abnormalities noted. No problems with joint pain or movement.
- Psychiatric Reports: She reports she is concerned about her breast because she does not know her family history due to being adopted at birth. Reports she just wants to be sure everything is okay.

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- Gynecologic: LMP 3 weeks ago, normal flow and duration. Denies dysmenorrhea, abnormal bleeding, post coital bleeding, breakthrough bleeding, vaginal discharge, or painful intercourse.

**Impression**

Left breast mass.

**Plan**

1. Patient advised to decrease caffeine intake, wear supportive bra, and follow-up for further evaluation with diagnostic mammogram and sonogram.
2. Patient advised to call 24 hours after diagnostic evaluation for discussion of results.
3. She was advised to call if area does not resolve with above recommendations.

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**Diagnostic Testing Results**

J.B. was seen one week later for bilateral diagnostic mammogram and sonogram. After diagnostic evaluation a 4 mm benign-appearing mass was noted in left breast on ultrasound.

Mammogram was without abnormalities.

**Discussion of Results and Follow-Up**

J.B. was notified of above results and encouraged to follow-up in 6 months for repeat mammogram and sonogram of left breast. She was also encouraged to follow-up sooner if problems arise.

**ICD-9 Codes**

- Breast mass 611.2
- Mastalgia 611.71

**Encounter Two:**

**Review of Systems**

- Review of Systems negative except for complaints of right breast tenderness and redness that has been present for 4-5 days. Denies fever or chills or other problems. Reports she is not breastfeeding.

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### Physical Examination

- Vital signs: B/P 132/78, P-88, R-18, T=98.6 (oral).
- General: Healthy female, appears anxious but not in acute pain.
- Weight: 225, Height: 5'4", BMI: 38.7 (obese).
- Breast examination: Upon physical inspection of breasts 5cm-7cm irregular erythematous (redness) area noted on right breast. As patient is examined breasts do not exhibit signs of puckering or dimpling or skin changes except redness noted above. Both cervical and axillary lymph nodes are non-palpable upon examination. No palpable masses or tenderness noted on left breast (previous mass is not palpable on today's examination). Slight induration (swelling) noted as well as warmth of area upon palpation of 5cm-7cm area noted at 10 o'clock about 8 cm from areola. Area is tender to palpation without underlying mass.

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*Mastitis is a common inflammatory condition of the breast, which can arise both in lactating and non-lactating women. Symptoms of mastitis include a tender wedge-shaped quadrant of the breast that becomes erythematous and extremely tender over a period of a few days (Molckovsky et al., 2009). Symptoms of breast abscess also include erythema, swelling, and painful infiltration of the breast (Moore, 2005).*

- The remainder of the physical examination is deferred.

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### Differential Diagnosis

- Lactational mastitis
- Breast abscess

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- Inflammatory breast cancer

*The American Joint Committee on Cancer (AJCC) states that inflammatory breast cancer is characterized by diffuse erythema (redness) and edema (swelling) of the breast, often without underlying mass (Greene . . . Fritz, 2002).*

### Diagnosis

Non-lactational (non-puerperal) mastitis

### Diagnostic Testing

1. A culture of the infection could not be obtained, area not draining and no evidence of abscess was seen for further evaluation.
2. A complete blood count was completed to evaluate the sample for leukocytosis (elevated white blood count). Values on the CBC are as follows: (all values normal) Hemoglobin (12.8) Hematocrit (37.2); WBC (5.5); Platelets (329);

*Individuals who present with mastitis will usually have constitutional symptoms of infection such as fever, lethargy, and leukocytosis (Johnson, 2003; Kidwell, 2007; Rosa, 2010).*

### Follow-Up

J.B. was advised to complete antibiotics and follow-up if symptoms do not improve within the next 4-5 days or if symptoms worsen.

## Third Encounter

### Review of Systems

- Review of Systems negative except for complaints of right breast pain and soreness seems to be spreading instead of improving with antibiotics. J.B. also reports that her breast is becoming increasingly red in color. Denies fever, chills, or other problems.

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### Physical Examination

- Vital signs: B/P 122/80, P-80, R-18, T=97.4 (oral).

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*Individuals with inflammatory breast cancer do not typically experience fever* (Johnson, 2003; Kidwell, 2007; Rosa, 2010).

- General: Healthy female except for increased breast pain.
- Weight: 221, Height: 5'4", BMI: 38.5 (obese).

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*Elevated body mass index (BMI) and younger age at first delivery are factors that have been associated with inflammatory breast cancer diagnosis.* (Cariati, Bennett-Britton, Pinder, & Purushotham, 2005; Molckovsky, Fitzgerald, Freedman, Heisey, & Clemons, 2009; Woodward & Cristofanilli, 2009).

- Breast examination: Upon physical inspection of breasts 7cm-10cm irregular erythematous (redness) area noted on right breast. As patient is examined breasts do not exhibit signs of puckering or dimpling or skin changes except redness noted above. Both cervical and axillary lymph nodes are non-palpable upon examination. No palpable masses or tenderness noted on left breast (previous mass is not palpable on today's examination). Slight induration (swelling) noted as well as warmth of area upon palpation of 7cm-10cm area noted at 10 o'clock about 8 cm from areola. Area is tender to palpation without underlying mass.

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*According to the AJCC, inflammatory carcinoma of the breast is characterized by diffuse erythema (redness) and edema (swelling) of the breast, often without underlying mass* (Cariati, Bennett-Britton, Pinder, Purushotham, 2005; Green & Fritz, 2002).

*It is also possible have a breast abscess or case of mastitis that does not respond to antibiotics due to antibiotic resistance, but it is imperative to carefully evaluate these patients to rule out inflammatory breast cancer (even in those who are breastfeeding* (Rosa, 2010).

- The remainder of the physical examination is deferred.

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**Differential Diagnosis**

- Lactational mastitis
- Breast abscess
- Inflammatory breast cancer

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**Diagnostic Testing**

1. A culture of the infection could not be obtained, area not draining and no evidence of abscess was seen for further evaluation.
2. Diagnostic mammogram and sonogram of both breasts was ordered and patient returned for testing within 48 hours.

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**Impression**

Non-lactational (non-puerperal) mastitis, not responding to antibiotics as expected

**Plan**

1. J.B. was prescribed amoxicillin/clavulante potassium 875mg (#40) and instructed to take one PO Q 6hr x 10 days.
2. A diagnostic mammogram and sonogram of both breasts was ordered.

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**Follow-Up**

1. J.B. was advised to follow-up for a visit after completion of the mammogram and sonogram to discuss results of testing and further follow-up that would be needed.
2. Emergency instructions were also given.
3. Discussed the importance of patient follow-up, patient encouraged to come back to the clinic if antibiotic change does not improve symptoms for further evaluation.

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**Encounter Four****Review of Systems**

Review of systems essentially unchanged from last encounter except S.B reports antibiotics are not helping to resolve the redness and pain, and areas of redness and pain are becoming progressively worse.

**Physical Examination**

Examination was completed and is essentially unchanged from 72 hours ago.

**Diagnostic Findings**

Findings on the mammogram were positive for non-specific skin thickening with no other pathology indicated. The sonogram indicated superficial, inflammatory skin changes.

*According to Ferrera (2008), findings on mammogram and sonogram of the breast are not typically conclusive, breast mammogram and sonogram can assist providers in making the diagnosis of inflammatory breast cancer.*

**Diagnosis**

Inflammatory breast cancer

**ICD-9 Codes**

Inflammatory breast cancer

174

**Plan**

She was referred to a local breast surgeon for breast biopsy and further evaluation.

**Outcome**

She was seen by a local breast surgeon within 72 hours and failed to have any response to antibiotic treatment while awaiting evaluation. A diagnosis of inflammatory breast cancer was made, with subsequent treatment initiated. Then inflammatory breast cancer was staged at IIIB (T3, N1, N). The tumor was larger than 5 cm in greatest dimension; metastasis of regional lymph nodes was detected; and no distant metastasis was noted. The patient began immediate chemotherapy of the area but failed to respond to both the first and second regimens. She was then transferred to a regional cancer clinic. She has now been lost to follow-up.

**Case Study Questions**

1. What is the pathophysiology behind the presenting symptoms of inflammatory breast cancer?
2. What common clinical symptoms are seen with IBC?
3. What clinical aspects of the diagnosis of IBC would give clinicians a greater suspicion for inflammatory breast cancer?

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**Inflammatory Breast Cancer**

Inflammatory breast cancer is a rare and aggressive form of breast cancer which has a rapid onset and is also rapidly progressive (Woodward, & Cristofanilli, 2009). The characteristic findings of IBC upon examination include skin erythema (redness) and peau de'orange (edematous thickening and pitting of the skin the develops from edema surrounding the hair follicle) changes upon the skin of the breast (Cariati, Bennett-Britton, Pinder, & Purushotham, 2005; Gonzalez-Angulo, Hennessy, Broglio, et al., 2007). Findings on pathologic specimens include a diffused invasion of the dermal lymphatics by carcinoma cells (Cariati, et al., 2005).

This diffused invasion of the dermal lymphatics and tumor emboli causes the obstruction of the surrounding lymphatics and leads to the clinical symptoms of IBC (Molckosky, Fitzgerald, Freedman, Heisey, & Clemmons, 2009; Woodward, Cristofanilli, 2009).

Inflammatory breast cancer is more common in black women as well as younger women, elevated body mass index (BMI) and a younger age at first birth (Cariati, Bennett-Britton, Pinder, & Purushotham, 2005; Molckovsky, Fitzgerald, Freedman, Heisey, & Clemons, 2009; Woodward & Cristofanilli, 2009). IBC also can occur in women who have a history of a previous breast cancer (Cariati, et al., 2005; Molckovsky, et al. 2009). Because inflammatory breast cancer is rare, it is difficult to accurately identify population risk factors. Health care providers should consider the diagnosis of IBC in all women who report inflammatory breast symptoms who do not resolve as expected (Molckovsky, et al., 2009).

#### **Common Clinical Presentation**

Within the literature, several common presentations are listed with inflammatory breast cancer. Molckovsky, Fitzgerald, Freedman, Heisey, and Clemmons (2009) reports that patients with IBC usually present with a color change of one breast that begins as a pink color and rapidly progresses to dark red that continues spreading throughout the entire breast. The patient may also experience a feeling of heaviness, enlargement of the breast, and a sensation of heat over the breast which usually progress over a period of two to three weeks and the patients usually do not develop a fever. (Molckovsky et al., 2009). Finally, Molckovsky et al.(2009) further states that it is common for a patient to present with significant lymphadenopathy due to the rapid progression of dermal invasion.

According to Rosa (2010), inflammatory breast cancer is characterized by a rapid enlargement of breast where the affected breast looks larger. This change in the breast it is also characterized by erythema with edema, induration (ridging) of the breast tissue, and

lymphadenopathy (swollen lymph nodes) (Rosa, 2010). Patients with IBC do not typically experience fever or exhibit elevated white blood cells (WBC) counts on evaluation and they will not show significant improvement with antibiotics when the “infection” is treated (Rosa, 2010).

### **Differential Diagnosis**

Many women who have inflammatory breast cancer are originally diagnosed with more common inflammatory disorders of the breast such as lactational mastitis, non-lactational mastitis, and duct ectasia (Molckovsky, Fitzgerald, Freedman, Heisey, & Clemons, 2009). Ferrera (2008) explains that, because the presentation of IBC resembles infection, many clinicians are likely to prescribe antibiotics to treat the “infection.” Often, Rosa (2010) states, treatment with various types of antibiotics will continue for a period of weeks while the cancer spreads rapidly. Approximately 35% of patients will also have distant metastasis when IBC is eventually diagnosed, leading to a far poorer prognosis (Charafe-Jauffret, Tarpin, Viens, & Bertucci, 2008). Current recommendations are to biopsy the inflamed area(s) of the breast if a patient does not respond to antibiotics within the first seven days (Rosa, 2010).

Mastitis is a common inflammatory condition of the breast. Lactational mastitis will occur in about 10% of women and usually develops rapidly over two to three days with a wedge-shaped quadrant of the breast which has erythema and is extremely tender to palpation (Molckovsky, Fitzgerald, Freedman, Heisey, & Clemmons, 2009). Clinically, the majority of women will develop a fever and feel sick and oral antibiotics usually begin to improve the situation in 24-48 hours (Molckovsky et al., 2009). Constitutional signs such as fever and malaise are usually not found with IBC but evaluations for fever and complete blood count (CBC) status should be done at the same time that the antibiotics are initiated (Charafe-Jauffret, Tarpin, Viens, & Bertucci, 2008).

Cellulitis, breast abscess, and non-lactational mastitis also can present for women who are not breastfeeding. Johnson (2003) states that women can develop mastitis when not lactating due to nipple piercing. For women reporting any inflammation in the breast tissue, careful attendance must be paid to the resolution of symptoms and to the discussion of warning signs in order to guide follow-up (Miller, 2005). Non-puerperal mastitis is commonly called “duct ectasia” or breast abscess. It usually presents with erythema, swelling, and painful infiltration of the breast (Miller, 2005). The majority of patients who present with non-puerperal mastitis will also have a positive culture for a bacterial infection within the breast tissue (Peters, Kiesslich, & Pahnke, 2002). Rosa (2010) further suggests that careful counseling and education of patients as well as prompt provider intervention (radiological assessment and biopsy) when the initial treatment therapies appear unsuccessful are integral to the diagnosis of IBC.

#### **Diagnostic Evaluation**

The gold standard for the diagnosis of IBC is a skin and tissue biopsy from the affected areas of the breast. While it is the preferred method of diagnosis, imaging studies can also be helpful in diagnosing IBC (Ferrera, 2008). When the above symptoms are present in a patient, instructing the patient to get a diagnostic mammogram as well as a sonogram of the breast can be helpful in the diagnosis but the findings on them are typically not conclusive (Ferrera, 2008). Yang, Le-Petross, & Macapinlac (2008) report findings on diagnostic mammogram and ultrasound that may be more distinctive of IBC include thickened skin (89%), increased breast density (59%), trabecular and stromal thickening (79%), and a breast mass (38%). They also found that 100% of patients with axillary lymph node involvement were detected by ultrasound (Yang et al, 2008). Other types of radiologic procedures such as MRI and PET scans are integral for the treatment as well as the evaluation and ongoing follow-up of IBC patients but are not

typically utilized during the diagnosis of IBC (Charafe-Jauffret, Tarpin, Viens, & Bertucci, 2008).

### **Clinical Highlights for Diagnosis**

During a review of current information on the diagnosis of inflammatory breast cancer, several signs, symptoms, and areas of clinical concern are noted among authors. Moore (2005) states that the classic triad of the rapid onset of breast pain (swelling and redness in a woman with previously healthy breast tissue) is a hallmark sign for IBC.<sup>12</sup> Kidwell (2007) recommends a workup to rule out inflammatory breast cancer if the inflammatory conditions of the breast do not resolve with one week of antibiotic treatment. Miller (2010) suggests considering IBC when a patient presents with an inflamed breast and to retain that consideration until the diagnosis is proven otherwise. Miller also stresses patient education and reinforcement regarding contacting their provider if the inflammation of the breast does not show noticeable improvement within a few days of starting the antibiotic. Finally, Miller reports that a sudden change in the breast tissue not associated with malaise or fever is also a warning sign of IBC.

Although the awareness of IBC has improved, there is still confusion regarding the diagnosis (Ferrera, 2008). Several barriers contribute to the lack of uniform criteria for diagnosis (Ferrera, 2008). First, the fact that it is a rare diagnosis contributes to its difficult diagnosis among clinicians. Second, Ferrera (2008) further states that few studies on IBC have been conducted within the research because of the difficulty in forming a usable study population. Third, a universally accepted definition and diagnosis protocol for IBC does not exist. With all of these challenges, it remains imperative for the provider to consider prompt and timely referral. In addition, thorough evaluation is needed to detect or to rule out cases of IBC (Ferrera, 2008).



**Conclusion**

Even though inflammatory breast cancer is a rare diagnosis and many clinicians have not seen a case of inflammatory breast cancer, IBC represents a significant aspect of the differential diagnoses in women who present with breast inflammation. Symptoms such as rapid breast enlargement, erythema, and pain in the breast tissue, which is usually unilateral and does not respond to standard antibiotic treatment, should be considered suspicious for IBC diagnosis. As patients and providers anticipate symptoms that would give clinical cues to a diagnosis of IBC, clinicians can be prompt with the diagnosis and evaluation to provide optimal outcomes for this aggressive and rare type of breast cancer.

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