



King Saud University
College of Medicine
Department of Medical Education

**“What options do
I have?”
Tutorial One**

Year Two, Reproduction System Block

Curriculum Development Unit

Student's Case

Case 2; 2014

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The Template of the PBL Cases is designed by Professor Samy A. Azer.

The Student Case and Tutor Guide are written by

- Dr. Maha Iqbal
- Dr Hala Kfoury
- Professor Samy Azer
- Dr Huda AlKareem

Amal Ahmad, a 36 year old housewife come to see Dr. Rania Al Khalid in her Surgery Clinic . Amal is very concerned because while she was having a shower two days ago, she felt a small lump in her right breast. She is worried because her older sister who lives in Jedda was diagnosed with a breast cancer four months ago. Amal is anxious lest she might have cancer.

Discussion Questions:

- Are there any difficult words you do not understand?
- List the key information about Amal.
- Identify Amal's presenting problems.
- For each problem, generate a list of possible causes (hypotheses).
- What further information would you like to know from history to refine your hypotheses?

History

Amal has been well and healthy. She has felt a mass in her right breast during self examination. She has no tenderness while examining her breast and noticed no nipple discharge or changes in the shape or the color of the areola and nipple. This has triggered her fears particularly after the death of her sister. She read in a weekly magazine that breast cancer can be familial. She is not sure whether there is a real mass in her breast. She never had any mammogram or any other investigations.

Amal has two sons who are 5 years and 3 years old respectively. She got married at the age of 29 years and she had her first baby when she was 30 years old. Both her children were born through spontaneous vaginal delivery with no complications. She has breast-fed both her children till the age of 2 years. Currently, she is taking oral contraceptive pills.

Past medical history

No history of chronic illnesses, hospital admission or surgery.

Allergy and Medication

Nil

Smoking and Alcohol

She occasionally smokes with her friends in parties. She does not drink.

Family history

Amal has three sisters; the eldest is 38 years old (who has been recently diagnosed with breast cancer). Her two younger sisters are aged 35 years and 33 years old. Amal and her sisters all had their first periods (menarche) when they were approximately 13 years old. Amal's maternal aunt was diagnosed with breast cancer when she was 39 years old and she died because of metastasis a year later. Both Amal's parents are alive and healthy.

Social history

Amal is happily married with two sons. She completed a bachelor degree in Arts but preferred to look after her family rather than work.

Discussion Questions:

- Are there words that you do not understand?
- Summarize key information that you have obtained from this progress.
- Identify patient's new problems. Provide hypotheses for each problem.
- What further information would you like to know through clinical examination and investigations?

Amal looks anxious. Her bodyweight is 95 kg and her height is 171 cm. Her BMI is 32.5. Her vital signs are summarized in the table below:

Vital signs

Vital signs	Amal	Normal range
Pulse rate	80 regular	60-100/min
Blood pressure	110/70	100/60-120/80
Temperature	37.1	36.6-37.2 °C
Respiratory rate	18	12-16/min

Breast examination:

The skin overlying both breasts is normal. Nipples and areola look normal with no spontaneous or induced discharge. On palpation there is no tenderness and no palpable mass. There are no palpable axillary or supraclavicular lymphnodes

Chest and Abdominal examination:

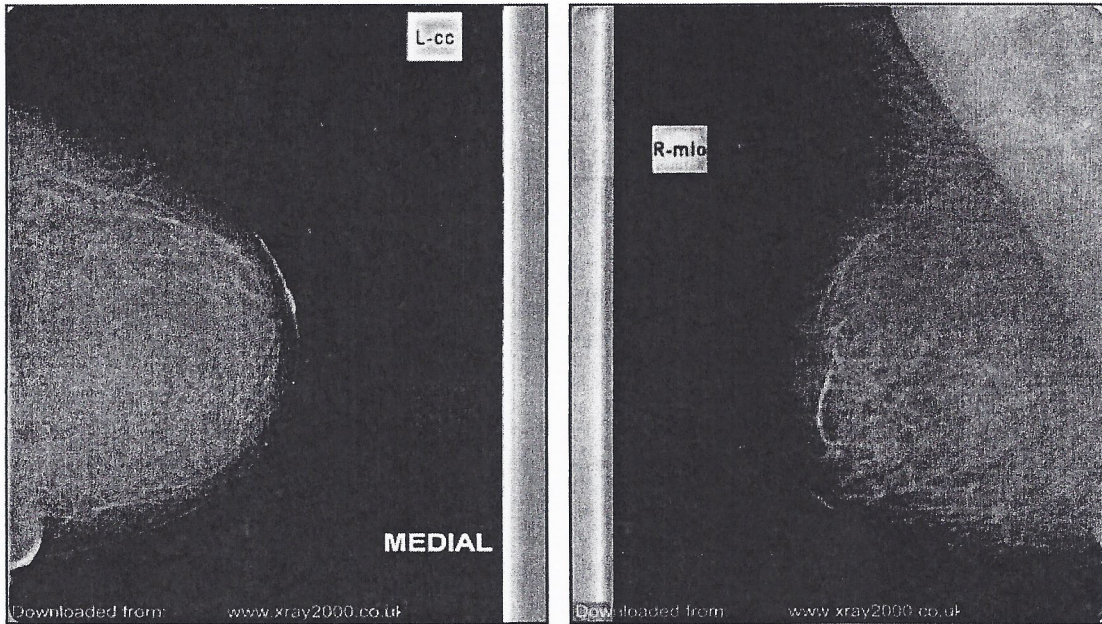
No tenderness on examination of the ribs. Auscultation of lungs is normal.
No palpable abdominal masses

Investigations

Dr. Rania explains to Amal that the clinical examination is normal. However because of her family history of breast cancer she needs to do a mammogram of her breasts and an ultrasound examination for the both breasts and ovaries. Dr Rania also recommends Amal to have a genetic screening test called BRCA 1 and BRCA 2 to detect gene mutation. She explains to Amal that the genetic test together with the mammography, ultrasound examination and the family history will help in assessing the risk of developing breast cancer.

Two weeks later the results of the investigations become available.

**Radiological images:
Mammogram of left and right breast**



Adapted from: Radiographic reporting. [Online] Available at: <http://www.xray2000.co.uk/> [Accessed: February 2011].

Report:

Both breasts are heterogeneously dense which is normal for her body weight. There are no obvious masses, calcifications, or other abnormalities present. Follow-up in 12 months is recommended.

Ultrasound examination of the breasts and ovaries

No abnormality detected

Genetic test: The exact genetic focus was first studied in Amal's sister and then Amal was studied for the identified defect.

BRCA 1	positive
BRCA 2	negative

Discussion Questions:

- Are there any terms that you do not understand?
- Summarize the key information that you have obtained from this progress.
- Use the new information for this progress obtained to refine and rank your hypotheses.
- Do you know a Nobel Prize laureate whose work has contributed to the advancement of our knowledge in physiology and/or pharmacology related to this case? What was exactly his/her work about? Give a summary.
- Work out with your group your "learning issues"

Resources

A note to students: You are not required to read all these textbooks and resources to prepare for your learning issues. You could use one textbook or one resource for each discipline. For example, for this case you will need to use a resource covering issues related to the case from the following disciplines: Physiology, Anatomy, Histology and Pathology. Once you have identified your learning resources, research them for your learning issues and the questions raised in the group discussion. You might choose to use alternative resources other than those listed below:

Textbooks:

- Drake RL, Vogl W, Mitchell AWM. Gray's anatomy for students. Philadelphia: Elsevier Churchill Livingstone, 2005.
- Gartner LP and Hiatt JL. Color Textbook of Histology. 2nd ed. Philadelphia: WB Saunders & Co, 2001.
- Kumar V and Cotran RS (2007). Robbins Basic Pathology. 8th ed. Philadelphia: Saunders WB.
- Rhoades R, and Pflanzer R. Human Physiology, 4th ed. London: Brooks/Cole, 2003.
- Guyton AC and Hall JE. Textbook of Medical Physiology. 10th ed. Philadelphia: WB Saunders & Co, 2000.
- Fox SI. Human Physiology, 9th Ed. McGraw Hill, 2005.
- History taking and examination skills: Munro JF, Campbell IW (2006). Macleod's Clinical Examination. Tenth Edition. Churchill Livingstone, UK.
- Communication skills (How to break a bad news?) :
Lloyd M, Bor R (2006). Communication Skills for Medicine. Churchill Livingstone. UK.

Educational websites:

1. Emedicine: Breast Cancer

<http://emedicine.medscape.com/article/283561-overview>

This educational website provides you with more detail about breast cancer. Be selective about what you need to know in relation to the basic sciences (i.e. pathology, risk factors, pathogenesis and genetics) covering breast cancer.

2. BRCA 1 and 2: Genetic testing and Cancer risk

<http://www.cancer.gov/cancertopics/factsheet/Risk/BRCA>

This website from the United States National Cancer Institute provides you with the information on BRCA 1 and 2 tests performed to assess breast cancer risk.

3. Breast Cancer Module I: Breast Anatomy, Physiology, and Pathology
<http://www.medscape.org/viewarticle/548921>

This link helps in Understanding breast anatomy, physiology and pathology and is designed specifically for medical students and clinicians.

4. Lactation: Medline Plus
<http://www.nlm.nih.gov/medlineplus/breastfeeding.html>

This link provides further links about different aspects of lactation such as an overview, research and related issues.

Interesting Articles:

Metcalf K. et al (2010) **Family History of Cancer and Cancer Risks in Women with *BRCA1* or *BRCA2* Mutations** . *JNCI J Natl Cancer Inst* first published online November 23, 2010 doi:10.1093/jnci/djq443.
Available online: <http://jnci.oxfordjournals.org/content/early/2010/11/23/jnci.djq443.long>



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Tutorial 2: Discussion of Learning Issues

(60 minutes)

Students: You should start by discussing your “learning issues” that you have identified at the end of tutorial one. You might spend about **60 minutes** on this task. A scribe on the whiteboard is needed to help in this process.

Once you have completed the discussion of your “learning issues”, you might progress to these questions. Spend about **10 minutes** on discussing them in your group. A scribe on the whiteboard will help in this process.

Discussion Questions:

- On the basis of the information provided, what is your final hypothesis? Justify your views.
- Discuss the role of genetics and other risk factors responsible for the development of breast cancer.
- What would you do at this stage?



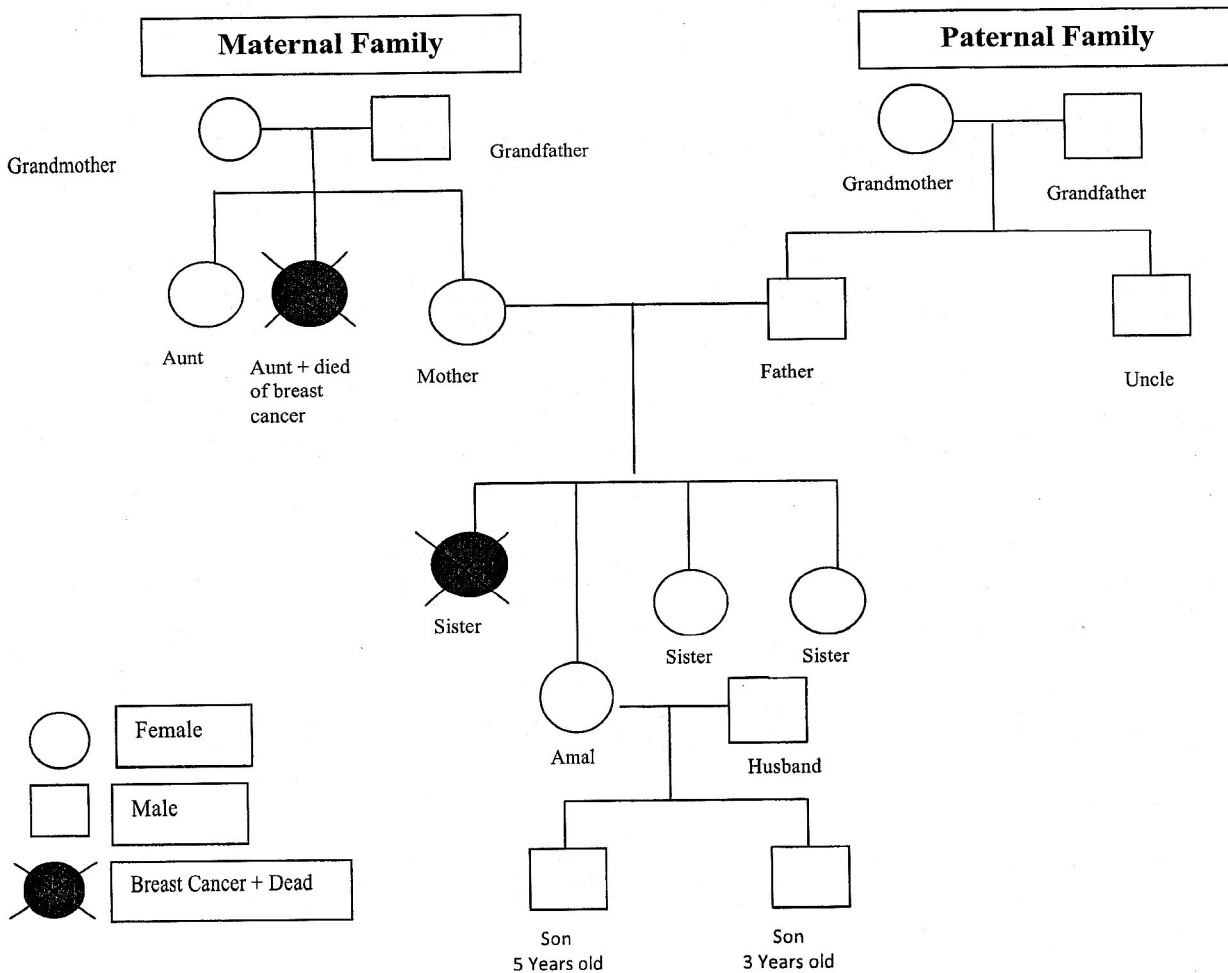
- Do you know a Nobel Prize laureate whose work has contributed to the advancement of our knowledge in physiology and/or pharmacology related to this case? What was exactly his/her work about? Give a summary.

Student: You could also after the completion of this case submit your work about the Nobel Prize laureate for this case to Professor Samy Azer at (sazer@ksu.edu.sa) or hand it to him.

Two weeks later, Amal and her husband come to see Dr Rania in her clinic. Dr. Rania prepares Amal for breaking bad news. She holds the meeting in a quiet meeting room and asks the nurse not to disturb them during the meeting.

She explains to Amal that the radiological tests and the clinical examination reveal no abnormality. However her genetic tests for BRCA 1 and BRCA 2 gene mutation reveal that that BRCA 1 gene mutation is positive. Dr Rania explains to Amal that BRCA 1 positive means an increased risk of developing breast and /or ovarian cancer at a younger age. This risk is significant with the presence of strong family history of breast cancer. Using the information provided by Amal about her family Dr. Rania draws a diagram to explain how the genetic make-up plays a role in breast cancer development in the family. The diagram is shown below:

Amal's Family Tree



Dr Rania responds to Amal's questions and discusses three options:

Dr Rania responds to Amal's questions and discusses three options:

Option 1:

Amal could have an annual MRI examination along with mammography and ovarian studies to early detect any changes in her breast and ovaries. She also needs to perform regular self-breast examination.

Option 2:

Amal could undergo a bilateral removal of the breast tissue (bilateral mastectomy) and her ovaries (bilateral oophorectomy) with the aim to reduce the risk for developing breast and ovarian cancer.

Option 3:

Amal could have chemical therapy for cancer prevention and meticulous surveillance for early detection of breast and ovarian cancer.

Dr Rania advises Amal to think about the different options and discuss them with her husband and family. Dr Rania arranges to see her in 4 days with her choice. Over the next a few weeks Amal is seen by a psychologist for counseling. Her husband and her family are very supportive to Amal in this process.

Discussion Questions:

- Discuss the diagram Dr. Rania draws to explain to Amal the risk factors for her disease.
- Discuss the advantages and disadvantages of each option provided to Amal
- What are the sources of stress that Amal might face at this stage?

Amal discusses the options with her husband and her family and she finally chose to undergo bilateral mastectomy and bilateral oophorectomy. The operation went well and Dr Rania arranged samples for histopathology examination.

No pathological abnormality was detected in her left breast and ovaries. Her right breast shows the presence of intraductal carcinoma. A normal section is shown for comparison

Amal's right breast section:

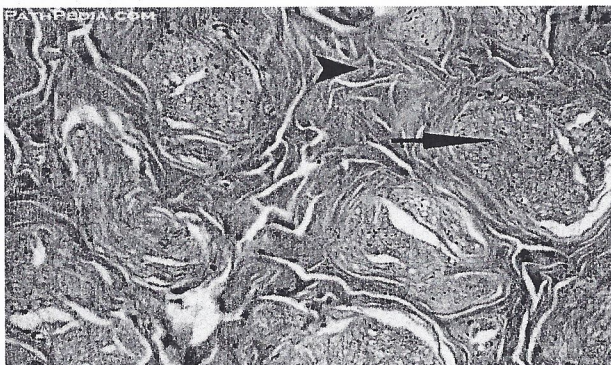


Adapted from: Ductal Carcinoma in Situ eAtlas of pathology [Online] Available at: <http://radiology.uchc.edu/eAtlas/Breast/188.htm> : [Accessed: February 2011].

Report:

A section from a mass in the right breast shows the presence of intraductal carcinoma.

Normal Breast Tissue:



Adapted from: Pathpedia breast [Online] Available at: [http://www.pathpedia.com/Education/eAtlas/Histology/Breast/Images.aspx?imageName=Normal-breast-histology-\(4-BT04H%20-2\)](http://www.pathpedia.com/Education/eAtlas/Histology/Breast/Images.aspx?imageName=Normal-breast-histology-(4-BT04H%20-2)): [Accessed: February 2011].

Discussion Questions

- Discuss the psychological impact of these results on Amal?
- On long-term basis what is your plan for Amal?

Case Closure

(10 minutes)

After her discharge from hospital, Amal receives a number of counseling sessions and has been supported by her husband, friends and family. Gradually she becomes able to overcome her fears and move on with life. She regularly reviews her treating doctor every six months for follow-up. There is no evidence from clinical examination and investigations of recurrence of the disease.

Tutor's note:

In the last 10 minutes of the tutorial, you might encourage your group to discuss how they could work better as a group. What are the things they need to change and what things they need to improve? This discussion is very useful and will help the group to function better as they work on the next PBL case.

Challenging and Revision Questions

Tutors: Students could think about these questions on their own as they review the case. They might discuss their answers with their friends.

- Discuss the anatomy and physiology of the female breast
- Discuss the hormones responsible for breast development and lactation in females
- Discuss the risk factors in development of breast cancer
- Explain the role of genetics including BRCA 1 and BRCA 2 gene mutation in breast cancer development.
- Discuss the pathology and pathogenesis of breast cancer.
- Discuss the pharmacology of drugs used in management of breast cancer

Learning Objectives:

On completion of this PBL package the students should be able to

- Understand the anatomy and physiology of the female breast
- Discuss the pathology and pathogenesis of the breast cancer
- Understand the risk factors in the development of breast cancer.
- Explain the genetic basis in the role of mutation of BRCA1 and BRCA 2 genes in the development of breast cancer at an earlier age.
- Understand the screening guidelines in breast cancer awareness and prevention.
- Discuss management options and design a management plan for a patient with high-risk of developing breast cancer