

# *“Looking for A Solution”*

GIT Block, PBL; Case 1



**Done by:**

Bayan Al-Mugheerah

Nada Alouda

**Reviewed by:** Shaikha Aldossari.

# GIT Block, PBL; Case 1

## "Looking for A Solution"

**Thank you** for your critical comments and helpful suggestions on PBL teamwork. We have taken your suggestions seriously and we hope that it will come up to your expectations.

Please be informed that the reading material for this case was **unreachable**. Our apologies! :c

### Color Guide:

- **Red:** Relatively important & mentioned in case tutorials.
- **Black:** Questions.
- **Blue:** Answers (mentioned in case tutorials).
- **Green:** Additional answers/notes.
- **Orange:** Explanation.

### Learning Objectives:

On completion of this PBL package, students should be able to:

1. Link the anatomy and histology of the duodenum, jejunum and ileum to discuss their functions.
2. Discuss the mechanisms by which loose bowel motions occur.
3. Apply knowledge from physiology, histology, and pathology to discuss the pathogenesis of coeliac disease.
4. Understand the physiological mechanisms underlying the absorption of fats and the different mechanisms responsible for abnormal loss of fat in the stool (steatorrhoea).
5. Construct a mechanism showing how changes in the structure of the small intestine resulted in the patient's symptoms, signs and laboratory results.
6. Construct a brief management plan showing management goals, and management options for a patient with coeliac disease.

# GIT Block, PBL; Case 1

## "Looking for A Solution"

### Case Scenario

#### Key information:

- 1) Female.
- 2) 22 years old.
- 3) University student.

#### Presenting problems:

- 1) Loose bowel motions (5-6 times), (duration: 4-5 months).
- 2) Abdominal discomfort.
- 3) Weight loss (lost 3 kg).

#### History:

- 1- Loose stool \ but no mucus or blood.
  - Sometimes stool shows undigested food \ bulky and offensive.
- 2- Abdominal discomfort → dull ache all over the abdomen (degree of pain = 2 to 3).
  - This pain doesn't prevent her from doing daily routine work.
  - This pain is not related to her menstrual period.
- 3- She is unable to gain her weight back again.
- 4- Her menstrual periods are regular and comparable with her sisters (not excessive menstrual blood or pain).

**Past Medical History:** iron-deficiency anemia, she took tablets for few months but stopped it due to abdominal upset.

**Family History:** one of her two sisters is on insulin for type 1 diabetes (it's usually associated with celiac disease).

**Medication and Allergy:** Nil.

**Alcohol and Smoking:** Nil.

#### Clinical Examination:

She looks pale and not in pain. She has no skin bruises or palpable lymph nodes.

##### **1- Vital signs.**

##### **2- Abdominal examination:**

Her abdomen is soft and not rigid or tender.

Her liver, spleen and kidneys are not palpable and no palpable masses.

##### **3- CVS & Respiratory examination:** Normal.

# GIT Block, PBL; Case 1

## "Looking for A Solution"

### Questions

Before answering the questions below, please read tutorials 1 and 2.

**Q1: What is the diagnosis of this case & under which category of diseases is it?**

Celiac disease which is a malabsorption condition.

**Q2: Which part of the digestive tract is the most likely affected according to Fatma's symptoms & mention the main function of this organ?**

- The small intestine.
- Absorption of nutrients.

**Q3: Name 3 foods that aggravate her symptoms?**

- 1- Wheat.
- 2- Rye.
- 3- Barley.

**Q4: What is the name of protein found in previous foods that triggers the immune reaction in celiac patients & produce antibodies?**

Gluten protein.

**Q5: From history, the patient has abdominal discomfort and she cannot localize the pain, in other words, how can we describe this type of pain (non-localized pain)?**

Dull aching pain (sensation).

**Q6: What's the difference between pain and tenderness?**

Pain: the area hurts even though no pressing or palpation. Tenderness: pain is felt once you palpate or press the area.

**Q7: Which type of diabetes is insulin-dependent diabetes?**

Type 1 diabetes mellitus.

**Q8: The doctor arranged some investigations to know the problem of Fatma's condition, what are these 2 investigations (**the first investigations not the confirmatory investigations**)?**

- 1- Blood tests (full blood count).
- 2- Stool analysis (microscopy).

**Q9: What are the important results from full blood count?**

- 1) Low hemoglobin → iron-deficiency anemia.
- 2) Low MCV → iron-deficiency anemia.
- 3) Low MCHC → iron-deficiency anemia.

(MCV and MCHC are used to diagnose anemia and can help determine what type of anemia).

# GIT Block, PBL; Case 1

## "Looking for A Solution"

**Q10: Enumerate the tests that we look for in stool analysis?**

- 1- Red blood cells.
- 2- Pus cells.
- 3- Mucous.
- 4- Ova and parasites.
- 5- Fat globules.
- 6- Undigested food fibers.

**Q11: From previous question, are they found in normal stool? If so, mention the normally found ones.**

No, all of them are not found normally (they should be Nil in stool analysis).

**Q12: What is the important result from stool analysis?**

- 1) Fat globules → Fat malabsorption.
- 2) Undigested Food Fibers.
- 3) Her stools are semi solid and not watery.

**Q13: What is the medical terminology of taking a very small sample (tissues or cells) from the lining of an organ to check for illness?**

Biopsy.

**Q14: What further investigations the doctor requested to confirm the diagnosis?**

- 1- Small intestinal biopsy (most important).
- 2- Blood tests.

**Q15: What is the gold standard diagnosis of celiac disease?**

Small bowel biopsy from the duodenum or upper jejunum.

**Q16: What are the 5 major factors involved in the pathogenesis of Celiac disease?**

1. Genetic- HLA DQ2 or DQ8
2. Environment- gluten
3. Immune- IgA
4. Organ injury- chronic inflammation
5. Nutritional deficiency (Iron, vitamin, minerals, later water and fat)

**Q17: What are the histopathological findings of celiac disease?**

Villi atrophy, crypt hyperplasia, increased intraepithelial lymphocytes, and mucosal inflammation.

**Q18: What is the name of the method that the doctor requested to detect the lining of the small intestine (duodenal \ jejunal regions) as well as taking the biopsy from these regions?**

Gastroscopy.

# GIT Block, PBL; Case 1

## "Looking for A Solution"

**Q19: Why has the doctor arranged further blood test to the patient?**  
In order to assess the type of Fatma's anemia.

**Q20: What type of anemia does Fatma have?**  
Iron deficiency anemia.

**Q21: From blood test, which content of blood we obtain the lack of iron, hence anemia?**  
Low level of **hemoglobin**.

**Q22: Why was the blood indices workout done twice?**  
Because there are other causes of microcytic hypochromic anemia. (In other words, you can't give iron supplement if the problem is with the transport)

**Q23: Which category of blood test will assess the following?**

- 1- Type of anemia → Iron studies.
- 2- Absorption of nutrients → Biochemical tests.
- 3- Sensitivity against certain proteins or foods → Antibody tests.

**Q24: What is the other name of?**

- 1) Cobalamin → Vitamin B12.
- 2) 25-hydroxycholecalciferol → Vitamin D.

**Q25: Enumerate the antibodies that we investigate in patients with celiac disease?**

- 1- Anti-tissue transglutaminase antibodies (tTG).
- 2- Deamidated gliadin peptide (DGP) **IgA**.
- 3- Deamidated gliadin peptide (DGP) **IgG**.

**Q26: What were Fatma's blood test results of the following? (Important in order to manage)**

**A) Iron studies:**

- 1- Serum **iron** → low.
- 2- **Folic acid** → low.
- 3- Vitamin B12 → normal.

**B) Biochemical tests:**

- 1- Serum albumin → low.
- 2- **Vitamin D** → low.
- 3- Total **calcium** → low.

**C) Antibodies:**

- 1- **tTG** → high titre.
- 2- **DGP IgA** → high titre.
- 4- **DGP IgG** → high titre.

# GIT Block, PBL; Case 1

## "Looking for A Solution"

**Q27: Name the nutrients that Fatma's small intestine can't absorb them? "See the previous question".**

Iron, folic acid, vitamin D, calcium, and fats (obtained from stool analysis).

**Q28: What are the abnormalities seen in Fatma's intestinal biopsy?**

- 1- Diffuse severe atrophy and blunting of the villi.
- 2- Chronic inflammatory cells infiltrating the lamina propria.
- 3- Crypt elongation.

**Q29: From previous question, which abnormality feature explains the low serum albumin?**

Damaged and atrophied villi.

**Q30: Mention the symptoms that the damaged villi (villi are important for absorption of nutrients) can explain?**

- 1- Low body weight.
- 2- Anemia.
- 3- Presence of fat globules in her stools.

**Q31: Can we control Fatma's condition? Yes.**

**Q32: How can we control Fatma's problem? (The management).**

- 1- Avoiding foods rich in wheat, rye & barley (dietary regime).
- 2- Iron tablets.
- 3- Folic acid tablets.
- 4- Vitamin D supplements.

**Q33: What are the consequences of such dietary regime free from wheat, rye & barley?**

- 1- Lowering the level of antibodies that attack the intestinal mucosa.
- 2- Allowing the lining of small intestine to grow back and hence improving the absorption of nutrients.

**Q34: What is the preferable time that the doctor prescribed Fatma to take iron tablets?**  
After meals.

**Q35: Have the symptoms improved after the management? If so, mention them.**  
Yes.

- 1- Loose bowel motions have gradually stopped & she passes stools once or twice daily.
- 2- She has no abdominal discomfort.
- 3- Her bodyweight has increased.

**Q36: Generally, what are Fatma's further investigations results after the management?**  
All investigations are back to normal range.

# GIT Block, PBL; Case 1

## "Looking for A Solution"

**Q37: What is the main blood result of further investigations that have been done after the management?**

Her hemoglobin has been raised back to normal limit.

**Q38: Most patients with celiac disease exhibit what type of antigen?**

Human leukocyte antigen (HLA-DQ2).

Sometimes (HLA-DQ8).

**Q39: What is the major complication of patients with celiac disease?**

Intestinal T-cell lymphoma.

**Q40: Enumerate other possible complications of celiac disease?**

- 1- Osteoporosis.
- 2- Short stature.
- 3- Chronic anemia.
- 5- Infertility in women.
- 6- Lactose intolerance.
- 7- Microscopic colitis.
- 8- Pancreatic insufficiency.

**Q41: What investigations to do in order to make a diagnosis of Celiac Disease?**

- Serology - Immunoglobulin A (IgA) antibodies.
- Stool examination - fat malabsorption.
- Full blood count - anemia, low serum iron level.
- Biopsy.

## General Information

### Celiac disease (or celiac sprue):

- Chronic disorder of the digestive tract that results in an inability to tolerate **gliadin**.
- Immunologically mediated inflammatory response occurs that damages the mucosa of intestine, resulting in maldigestion and malabsorption of food nutrients.
- Autoimmune disorder of the **small intestine**.