CASE3:
As dark as coffee ground

PBL
TEAMWORK

❖Learning issues:

- ✓ Anatomy and physiology of the liver
- ✓ Pathology and pathogenesis of liver cirrhosis
- ✓ Mechanisms responsible for portal hypertension and associated changes such as splenomegaly, ascites and esophageal varices
- ✓ Common causes of vomiting blood and underlying mechanisms
- ✓ How changes in the structure and functions of the liver resulted in the patient's symptoms, signs and laboratory results
- ✓ what are the investigations needed for saif? How these investigations can help you?
- ✓ A brief management plan showing management goals and management options

❖ Key information and Presenting problems:

- Saif (male), 58 years old, business man
- Vomited large amount of blood
- Sclera of Saif's eyes are yellow
- Increased abdominal girth

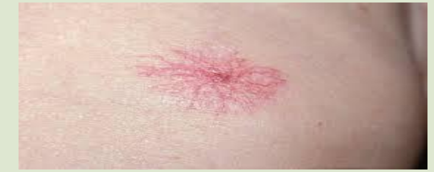
History:

- He always feels tired and not fit as he used to be
- He has to buy new bigger trousers due to progressive increased abdominal girth
- NO history of hyperacidity, heartburn or symptoms related to peptic ulcer
- NO changes in the color of urine
- He had road traffic accident 30 years ago and fractured both of his femurs and needed blood transfusion
- He smokes 20 cigarettes per day, and he drinks alcohol
- NO family history of blood diseases or blood disorders

NEW TERMS	
Spider naevi	Swollen blood vessels
Palmar erythema	Reddening of the palm
leuconychia	white discoloration appearing on nails
Gynaecomastia	Enlarged breast in men
Caput medusae	the appearance of distended and engorged paraumbilical veins. The name originates from the apparent similarity to Medusa's head, which had snakes in place of hair
Esophageal varices	Dilated veins in end of esophagus
Hernia	the protrusion of an organ or the fascia of an organ through the wall of the cavity that normally contains it

Gastrointestinal system examination

- Spider naevi (see pic) are found on his face, neck and both shoulders



- His hands show palmar erythema (see pic1) his nails show leuconychia (see pic2)

- He has gynaecomastia on both sides and his testicles are atrophied
- His abdominal girth is increased and there are dilated veins and the umbilicus (Caput medusae, see pic) NO umbilical or inguinal hernia

- Abdominal palpation: the liver span 8 cm (shrinked). The spleen is 3 cm below the left costal margin
- Percussion of his abdomen: there is positive shifting dullness (indicating the presence of free fluid in the peritoneal cavity)

Respiratory and CVS examinations

Nothing significant is found

Nervous system examination

Normal

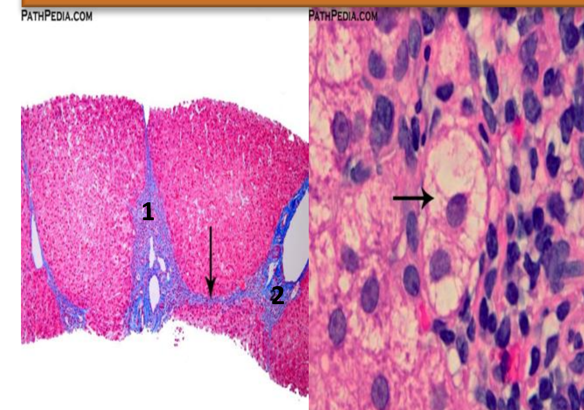
❖ Investigations:

Blood Investigations' results		
Test	Saif's results	Normal range
Haemoglobin (CBC)	8.3 ↓	11.5-15.5 g/100ml
MCV (CBC)	98 ↑	80-96 fl
PCV (CBC)	49 ↑	37-47
Platelet count (CBC)	89,000 ↓	160,000-500,000 mm3
Serum bilirubin (liver function test)	83 ↑	0-19 µmol/L
Aspartate aminotransferase (AST) (liver function test)	72 ↑	0-40IU/L
Alanine aminotransferase (ALT) (liver function test)	59 ↑	0-50 IU/L
Alkaline phosphate (ALP) (liver function test)	175 ↑	0-120 IU/L
Gamma - glutamyltranspeptidase (γ-GT) (liver function test)	109 ↑	0-50 IU/L
Serum albumin (liver function test)	28 ↓	35-50 g/L
Prothrombin time (liver function test)	20 seconds ↑	10-14 seconds
Hepatitis C virus (serology screening test)	positive	negative
Serum sodium (blood biochemistry)	132 ↓	135-146 mmol/L
Blood urea (blood biochemistry)	2.1 ↓	2.5-6.7 mmol/L
Serum creatinine (blood biochemistry)	120 ↑	79-118 µmol/L

Ultrasound

- ✓ **The liver surface is not smooth, It shows nodularity**
- ✓ **No thrombosis in the portal vein or intrahepatic veins**
- ✓ **No masses suggestive of liver malignancy**
- ✓ **There is a free fluid in the peritoneal cavity (Ascites)**

Liver pathology



Saif's biopsy sample shows:

- **Low power:**
1. there is a general liver architectural distortion caused by Hepatocellular necrosis
2. with repair in the form of bridging fibrosis (arrow) which may extend from one portal tract (#1) to another (#2).

- **High power:**
1. Inflammatory cellular injury
2. confirmed by ballooning enlargement of hepatocytes called (ballooning degeneration) (arrow). These changes although non-specific, they are commonly seen in viral hepatitis C infection

- **N.B:** A liver biopsy is contraindicated in his prolonged bleeding. So they did it after correcting his coagulopathy

Diagnosis: Liver cirrhosis

Most likely caused by hepatitis C virus infection. The changes in the liver resulted in blocking the normal blood circulation in the liver and forced the blood to shift into the systemic circulation via other veins outside the liver, this explains:

- ✓ Dilated abdominal veins (caput medusae)
- ✓ Bleeding and dilated veins at the end of esophagus (esophageal varices)
- ✓ Blood loss by vomiting (which is caused by ruptured esophageal varices)

Management

It is about treating complications:

1. Esophageal varices → esophageal banding
2. Ascites → Diuretics
3. Portal hypertension → Beta blocker
4. Prolonged prothrombin time (bleeding) → vitamin K injection

- N.B: before esophageal banding, the doctor gives him Octreotide to decrease the pressure of the portal vein and the bleeding tendency

Prognosis

The team at king Faisal hospital, liver center evaluated saif condition to make a liver transplantation. However, two weeks later he developed another attack and vomited two liters of blood, then died.

Questions

Q1	**What is the diagnosis?**	Q5	**Mention one characteristic of saif's liver biopsy (for high and low power) ?**
	Liver cirrhosis caused by hepatitis C virus infection		• **Low power:** bridging fibrosis from portal tract to another • **High power:** ballooning degeneration
Q2	**Describe the pathophysiology of portal hypertension?**	Q6	**What was the management in this case?**
	The changes in the liver resulted in blocking the normal blood circulation in the liver and forced the blood to shift into the systemic circulation via other veins outside the liver		1. **esophageal varices:** esophageal banding 2. **Ascites:** Diuretics 3. **Portal hypertension:** Beta blocker 4. **Prolonged prothrombin time (bleeding):** vitamin K injection
Q3	**What were the investigations in this case?**	Q7	**What is the indication of Octreotide?**
	Blood investigations, liver ultrasound and liver biopsy		**Esophageal varices (decrease the pressure of the portal vein and the bleeding tendency)**
Q4	**What is the management of liver cirrhosis that can cure it?**	Q8	**What are the abnormalities of ultrasound of Saif's liver?**
	Liver transplantation		1. **Liver surface nodularity** 2. **Presence of ascites**

Q9	**Portal hypertension can cause:** 1. Dilated abdominal veins (caput medusae) 2. Splenomegaly 3. Ascites 4. Esophageal varices	**Q13**	**Mention another treatment for esophageal varices?** Esophageal sclerotherapy
Q10	**What is the cause of saif's vomiting blood? And give a word for "vomiting blood"?** Due to ruptured esophageal varices. Hematemesis.	**Q14**	**What is the cause of liver cirrhosis in this case?** Hepatitis C virus
Q11	**Mention four signs which you can find in clinical examination of liver cirrhosis patient?** 1. Spider naevi 2. Leuconychia 3. Gynaecomastia 4. Palmar erythema	**Q15**	**How saif is died (from which complication he died)?** Due to ruptured esophageal varices Which leads to vomiting blood
Q12	**What is the cause of yellowish sclera of saif?** Due to high bilirubin serum	**Q16**	**what is the protein in that will decrease in case of liver cirrhosis ? why ?** Albumin Because it is synthesized in liver

DONE BY:

Omar Aldhasee

Ziyad Alajlan

Fatima AlQarni

REVISED BY:

Alaa Alharbi

PBLteamw433@gmail.com