Spleen

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Spleen

Anatomy:

-Wt 75-250 gm, LUQ, along 10th rib, between gastric fundus &L hemidiaphragm.

-Hilum:In the angle between stomach & L kidney,I n contact with tail of pancreas.

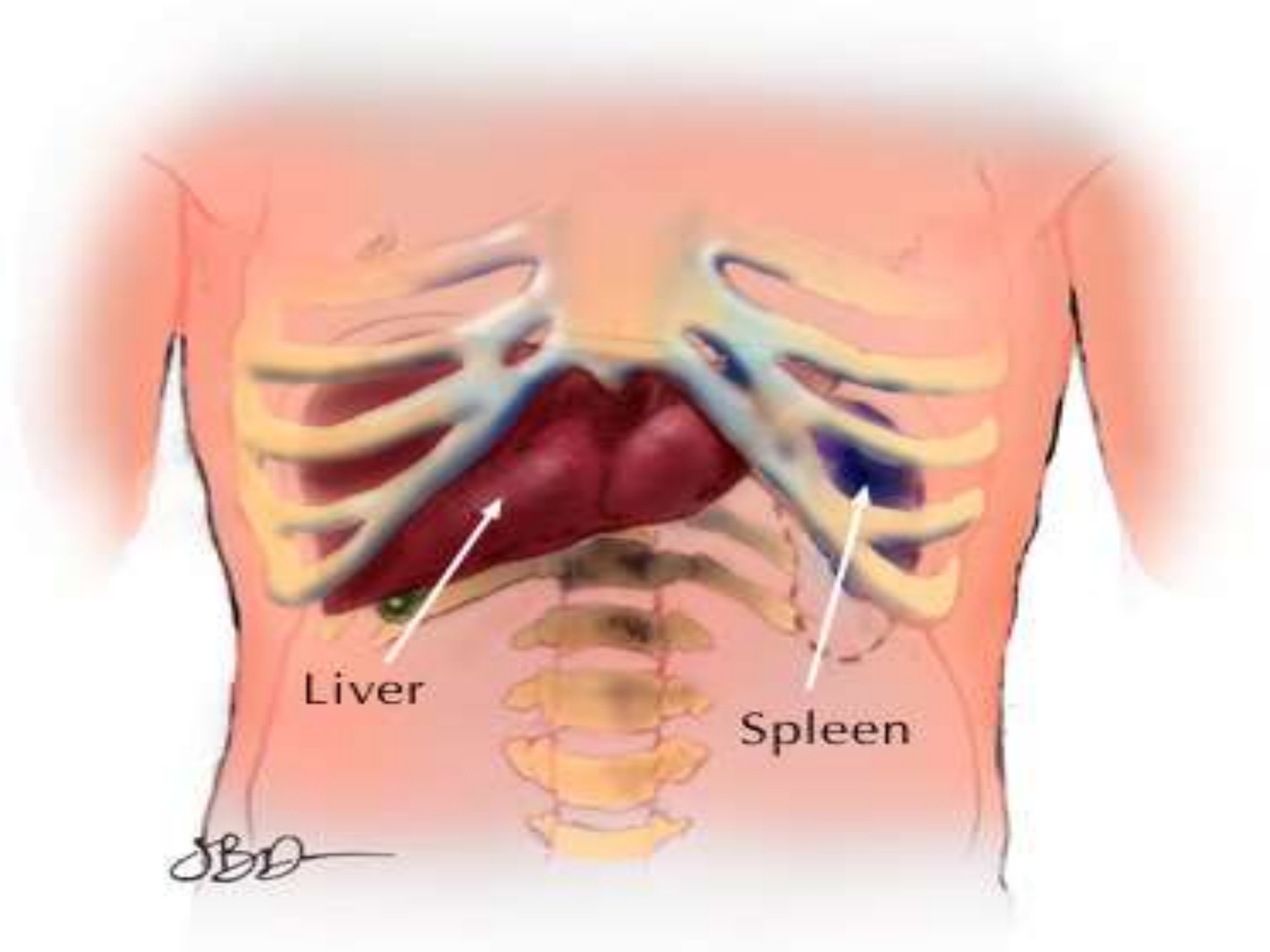
-Concave Visceral surface: impressions.

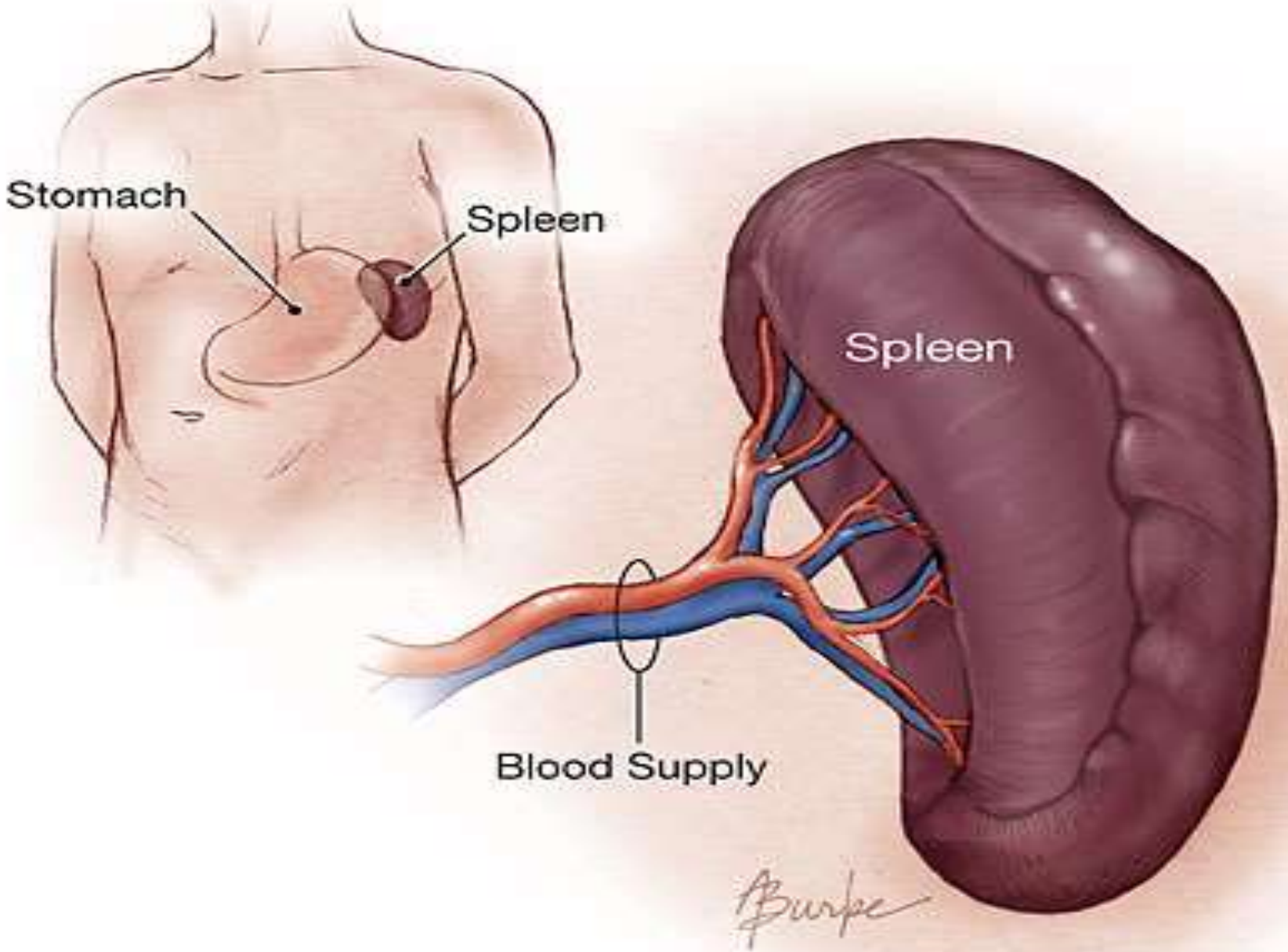
-Notch: infero lateral border,palpate in splenomegaly.

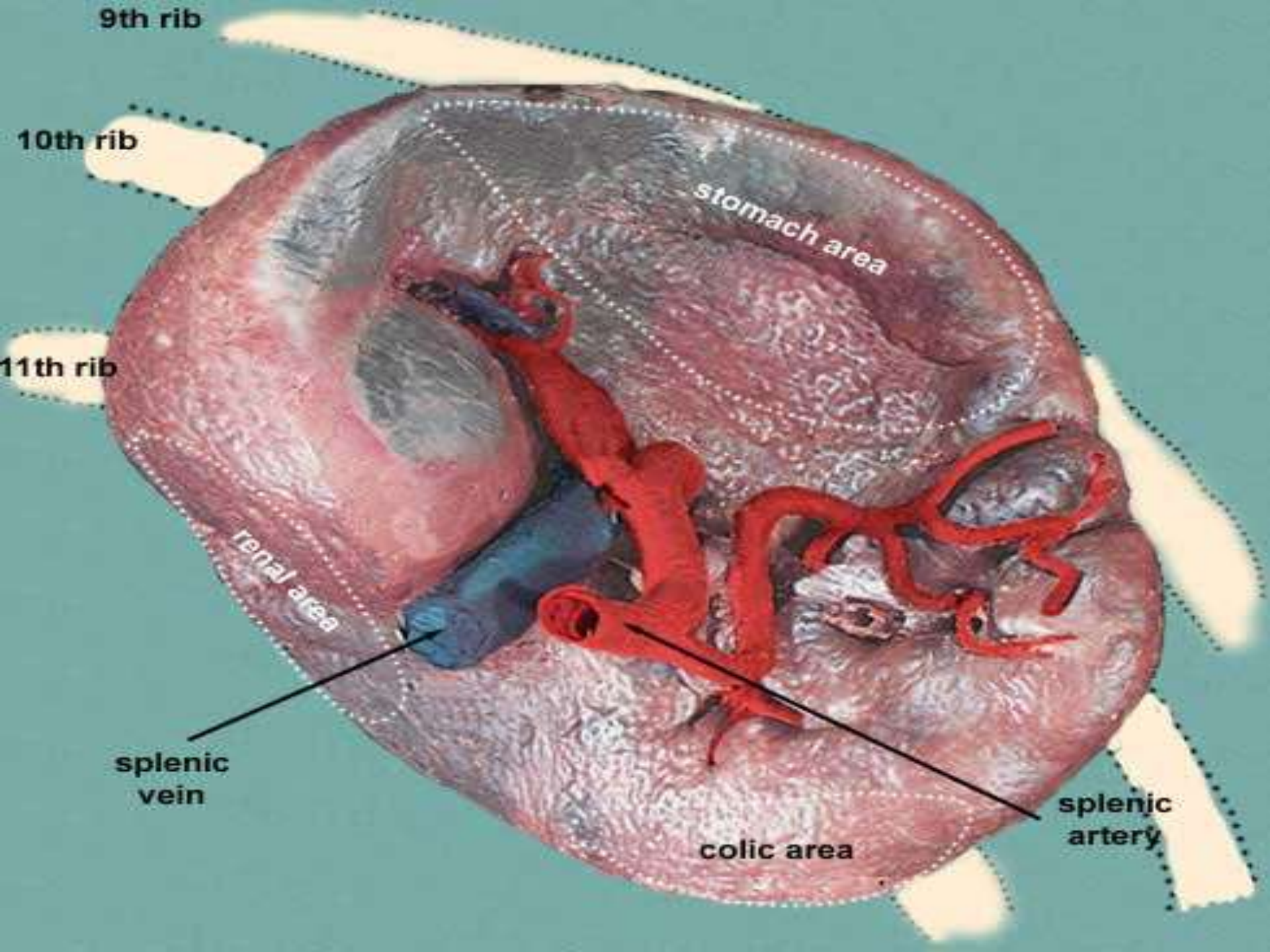
- **Arterial:** Splenic A. along upper border of tail of pancrease.

- **Vein**: Splenic V.at hilum behind pancrease.join SMV to form portal V.

- **Lymphatics**: efferent vessels from white pulp to L N in hilum to retropancrearic to coeliac nodes.

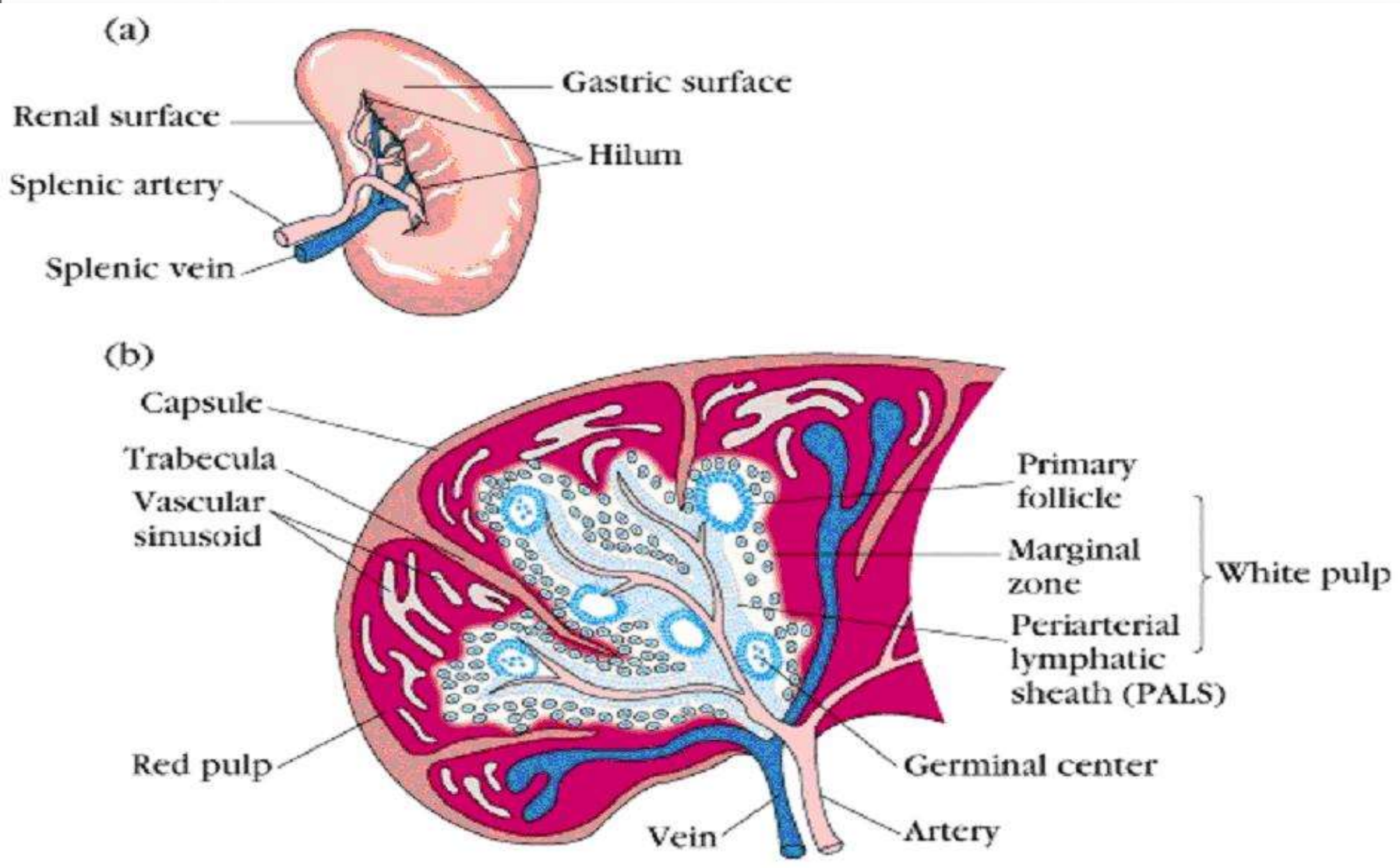

Liver
Spleen


Stomach
Spleen
Spleen
Blood Supply


9th rib
10th rib
11th rib
stomach area
renal area
splenic vein
colic area
splenic artery

Spleen

- **Physiology:**



Spleen

Functions:

1. Response to antigenic challenge
2. Destruction of abnormally shaped or rigid red cells
3. Phagocytosis of foreign substance
4. Platelet reservoir
5. Erythrocyte production

Investigation of the Spleen.

- FBC,Reticulocytes,tests for haemolysis.
- LFT & OGD in splenomegaly+portal hypertension in liver cirrhosis.
- Investigations for causes of splenomegaly including LN biopsy.
- Radiology:

1-Calcification: splenic infarct,splenic a. aneurysm,hydatid cyst,TB.

2-US,CT with contrast,MRI.

3-Tc99:is spleen site of RBC destruction?.

Congenital Abn of Spleen

1-Agenesis:rare.

2-Spleniculi:10-30% of population.

Hilum (50%), splenic vessels & tail of pancrease (30%), mesocolon & splenic ligaments (20%) .

**Failure to remove spleniculi during splenectomy…..persistant disease.

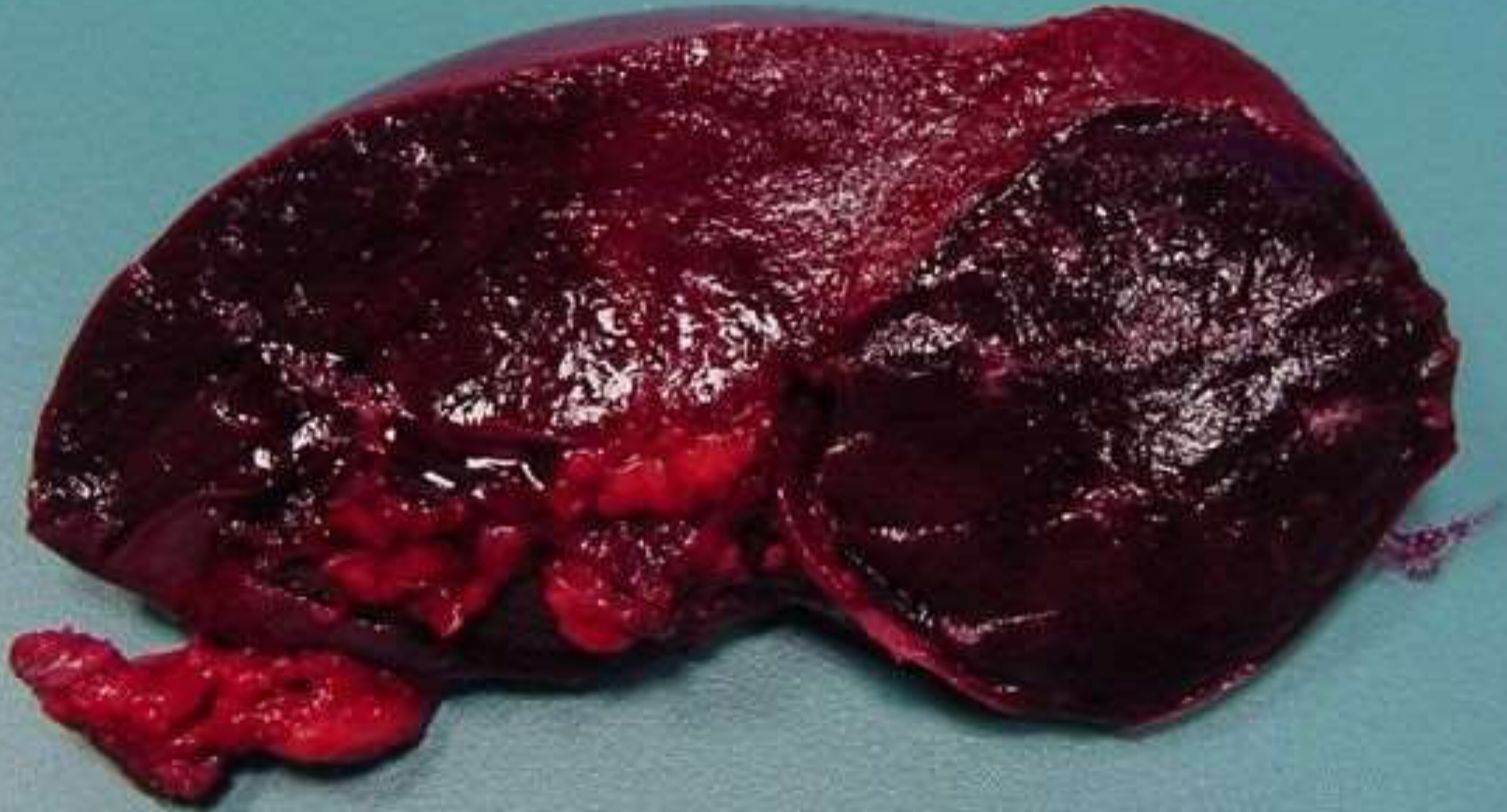
3-Hamartomas:rare

4-Non parasitic splenic cyst:

1-True,dermoid,mesenchymal.

2-False,trauma

3- Pseudocyst after pancreatitis.




A.D.A.M.

Splenic Rupture

Consider it :

1-Bunt abdominal trauma LUQ (RTA, Fall,…).

2-High Risk: diseased or enlarged spleen(rupture of a malarial spleen in trivial injury).

3-Fractures of 9^{th},10^{th}, 11^{th} left ribs.

4-Iatrogenic.

Presentation:

1-Succumbs rapidly from massive haemorrhage

2-Initial shock,recovery,signs of late bleeding:

Blood loss+tamponade+further bleeding.Reminder are,general signs of internal haemorrhage,local LUQ peritonitis signs,Kehrs sign+FAST US & CT.

3-Delayed rupture:uncommon with these days scan use In ER.

Splenic rupture

Management:

1-Conservative:

1-minimal or no abdominal findings+stable haemodynamically .

2-CT,isolated injury,no hliar injury,no massive distruption of spleen.

2-Immediate Laparotmy:

1-continuingblood loss despite adequate resuscitation.

2-associated abdominal organ injuries with blunt splenic trauma is up to 25-50%.

******Consider splenic preservation******

Splenic Trauma

- **Spleen**
  - Is one of most vascular organs , pass through it 350 liter of blood / day , contain 1 unit of blood at any moment !
  - **Types of trauma :**

    1- Blunt

    2- penetrating : Easily diagnosed , because patient almost always referred to Surgery .

Blunt Trauma of Spleen

- 25% of all blunt trauma of abdominal viscera
- More in male 3:2
- Most common cause is RTA
- Presentation :
  - Asymptomatic
  - abdominal pain (50%) , abdominal Distention , Hypotension (25%)

Diagnosis

- **For stable patient :**

1. ***UltraSound***
2. ***CT***
3. ***Angiography***

4. Plain radiography / chest and abdomen

- **The radiography signs of rupture are:-**

1. Obliteration of the splenic outline
2. Obliteration of the psoas shadow
3. Indentation of the left side of the gastric air bubble
4. Fracture of one or more lower ribs on the left side (present 27 % of cases
5. Elevation of the left side of the diaphram
6. Free fluid between gas filled intestinal coils .

5. CT

- Modality of choice
- Used with contrast .
- Findings :
  1. Lacerations : irregular hypodense area with no enhancement .
  2. Sub-capsular hematoma : regular shape , cresentric .
  3. Intraparenchymal hematoma .
  4. Fragmentation with autosplenictomy .

Diagnosis

- Unstable patient :
  - Open and See !
  - Peritoneal lavage
  - FAST

Spleen injury grading scale :

- **Stage 1 :**
  - Subcapsular Hematoma < 10 % of surface area .
  - Capsular tear depth < 1 cm .

Spleen injury grading scale :

- **Stage 2 :**
  - Subcapsular hematoma of 10 – 50 % of surface area .
  - Laceration depth :
    - 1-3 cm
    - Not involving trabecular vessels
  - Intraparenchymal Hematoma < 5 cm in Diameter .

Spleen injury grading scale :

- **Stage 3 :**
  - Sub-capsular Hematoma > 50 % , or Ruptured spleen .
  - Laceration depth :
    - > 3 cm
    - Involving the trabecular Vessels .
  - Intraparenchymal hematoma > 5 cm in diameter .

Spleen injury grading scale :

- **Stage 4 :**
  - Laceration involving hilar or segmental vessels with devascularization of > 25 % of speen

Spleen injury grading scale :

- **Stage 5 :**
  - Shattered spleen

Treatment

1. **Conservative:**
   - Admit patient to ICU
   - Repeated ultrasound
   - For those with stage 1 or 2 .

2- splenectomy

3- coservative splenoraphy .

suturing of spleen to prevent further bleeding .

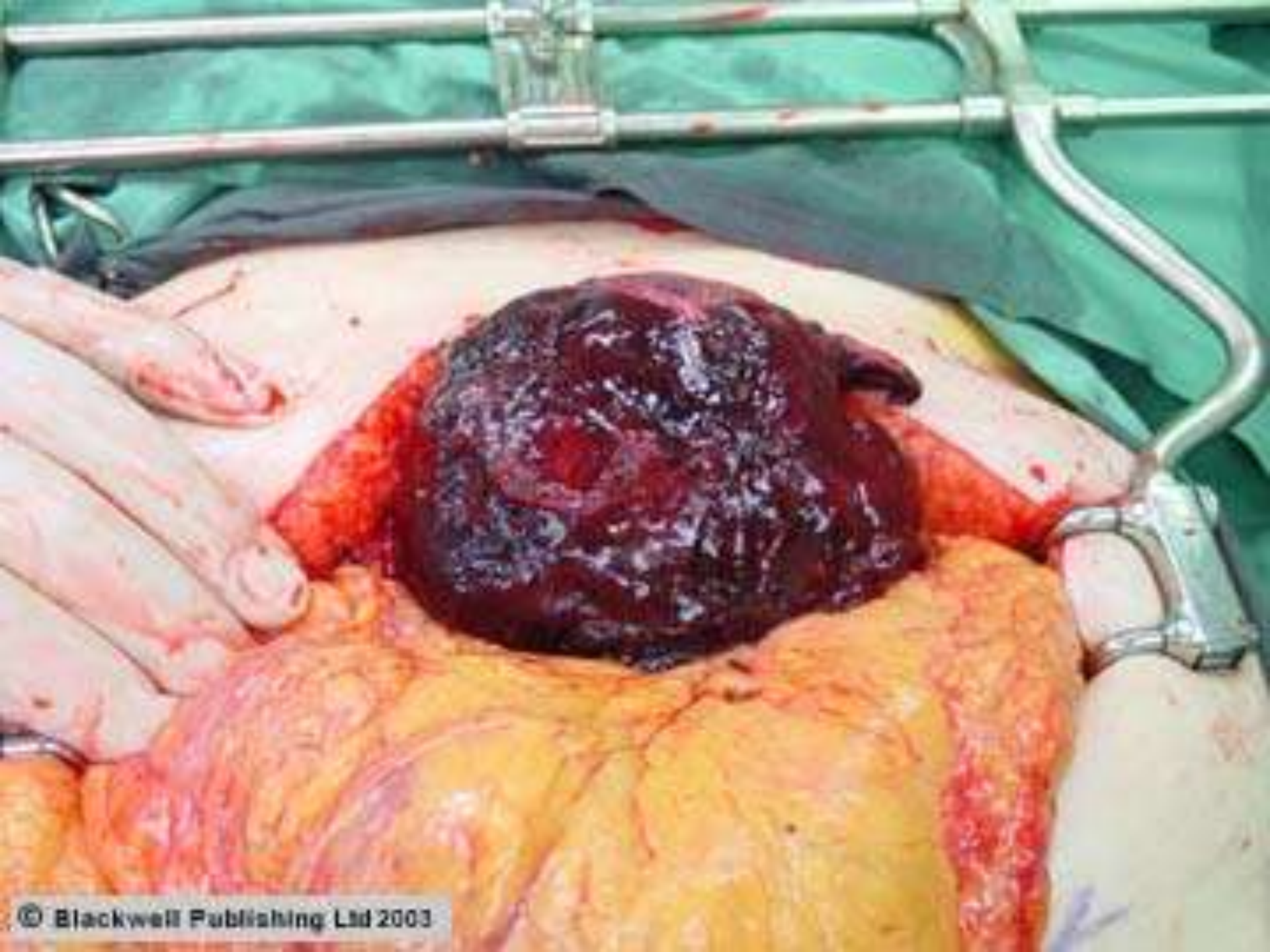
4- splenic artery Embolization .

- less mortality and morbidity than splenictomy

- mortality is related to % of splenic tissue Embolized .

- Complications :

1. Pancreatitis
2. Splenic Abscess
3. Pleural Effusion (most common)



Causes of splenomegaly

Infection
- Acute (viral)
- Subacute
- Chronic (malaria)

Immunological inflammatory disorders
- Felty syndrome (with rheumatoid arthritis and granulocytopenia)
- Systemic lupus erythematosus
- Sarcoidosis
- Amyloidosis
- Thyroiditis

Haemolytic anaemia

Immune thrombocytopenia

Portal hypertension
- Thrombosis of the portal vein
- Liver cirrhosis

Primary metastatic neoplasms
- Leukaemia (in particular, chronic lymphocytic leukaemia)
- Lymphoma/Hodgkin's disease
- Myeloproliferative syndromes
- Sarcoma

Storage diseases
- Gaucher's disease
- Niemann–Pick disease

Splenomegaly & Hypersplenism

Hypersplenism: *Clinical syndrome*

1-Splenic enlargement.

2-Any combination of anaemie,leucopenia or thrombocytopenia.

3-Compensatory bone marrow hyperplasia.

4-Improvement after splenectomy.

Splenectomy for Blood ds

1-ITP:

-15-50 y female.

-CP: Ecchymoses purpuric patches of skin & MM.

Post traumatic skin petechial haemorrhage.

Epistaxis,Menorrhgia.

10% palpable spleen.

- Investigations: B.T increased. C.T & P.T normal.

Thrombocytopenia.

Treatment

1-75% regress after 1st attack in paediatrics.

2-Steroid for short course in adult & children…recovery

3- Surgery: Refractory (more than 9 months+low platelet+ 2 relapses).Two thirds cure.

Splenectomy for Blood ds

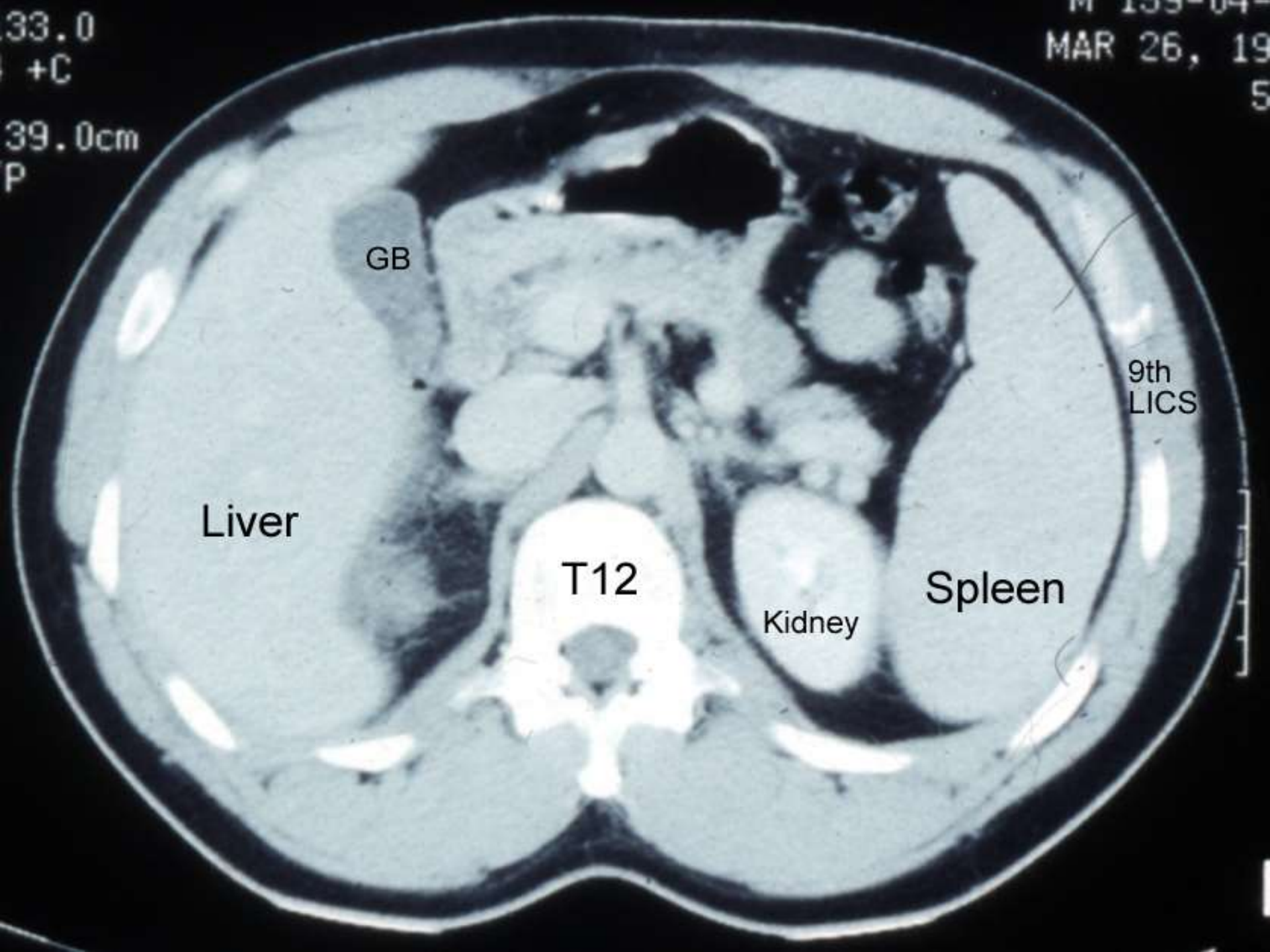
2-Haemolytic Anaemias:

1-Hereditary Spherocytosis.

2-Sickel cell anaemia.

3-Thalassaemia.

4-Acquired autoimmune haemolytic anaemia


33.0
+C
39.0cm
P
MAR 26, 19
5
GB
9th
LICS
Liver
T12
Kidney
Spleen

Heridatary spherocytosis

-Autosomal dominant.spherocytic RBC.

-Present in childhood.haemolytic jaundice+splenomegaly+pigment gall stones.

-Fragility test RBC haemolyse in stronger saline solution 0.6%(normally in 0.47% saline solution).

-Reticulocytes increase.

-Radioactive Cr 51 labelling RBC..RBC destruction.

Splenectomy for neoplasms

1-Haemangioma :Most common benign tumour of spleen Haemangiosarcoma (rare).

2-Lymphoma:most common cause of neoplastic enlargement.
---Splenectomy is for..

1-management.

2-diagnosis& staging.(CT is alternative for staging).

3-Myelofibrosis: Abnormal proliferation of mesenchymal elements in BM,spleen,liver & LN.

-Over 50,gross splenomegaly with LUQ pain.

-Splenectomy reduces the need transfusion & may relieve the pain.

Indications for splenectomy

Traumatic

- Rupture after blunt injury to the abdomen
- Iatrogenic injury during another procedure (particularly mobilization of the splenic flexure of the colon)

Haematological

- Immune thrombocytopenia
- Hereditary spherocytosis
- Autoimmune haemolytic anaemias
- Malaria
- Schistosomiasis
- Leishmaniasis
- Staging of haematological malignancies (e.g. Hodgkin's disease)

With other viscera

- Radical gastrectomy
- Pancreatectomy

Miscellaneous

- Treatment for gastric varices
- Treatment of splenic artery aneurysms
- Treatment of splenic cysts/tumours

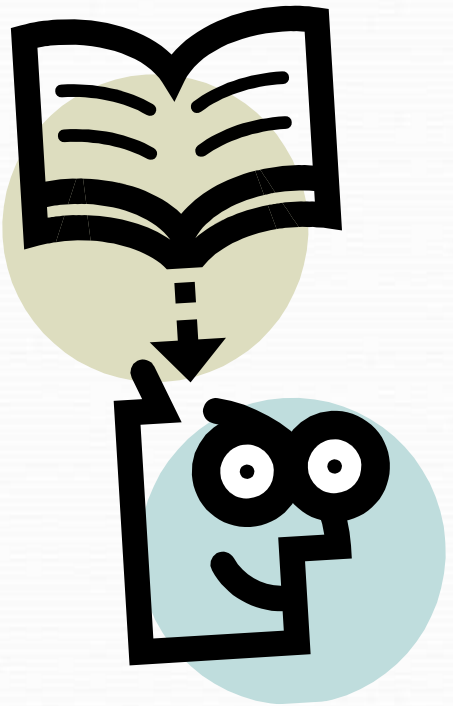
Splenectomy

Preop. Investigations:

1-Blood, FFP, Cryoprecipitate, platelets.

2-Coagulation profile.

3-Antibiotic prophylaxis



Splenectomy

Post operative complications:

1-Slipped ligature from splenic a…Haemorrhage.

2-Haematemesis(gastric mucosal damage)

3-Gastric dilatation.

4-Left basal atelectasis & Pleural effusion.

5-Injury to tail of pancrease.pancreatitis,abscess,fistula.

6-injury to greater curvature of stomach during ligation short gastric vessels…fistula.

Splenectomy

7-Venous Thrombosis.

Prophylactic aspirin if platelets more than 1 million

8-Post splenectomy septicaemia:

1-Strep pneumonia.

2-N meningitides.

3-H influenzae

4-E.coli.

Higher Risk Groups:

1-Young.

2-Chemoradiotherapy.

3-Splenectomy for blood dss.

9- OPSI (*overwhelming post splenectomy infection*) is a real clinical danger.

Splenectomy

OPSI:

1-Prophylactic daily penicillin if under 5 y until they are 10.

2-prophylaxis for 2-3 years if older tha 5y.
Oral Penicillin,Erythromycin,Aomxicillin,Co-Amoxiclav.

I.V same A.B above or Cefotaxime,Ceftriaxone or chloramphenicol if allergic to Penicillin or Cephalosporine

Splenectomy

Immunization and antibiotic prophylaxis

Vaccinations

- Pneumococcal vaccination before surgery and repeated at intervals of five years
- *Haemophilus influenzae* and meningococcal vaccination before surgery if not previously received
- Influenza vaccinations given every year
- Giving vaccines minimum of two weeks before surgery or as soon as possible after emergency surgery

Antibiotics

- Lifelong penicillin should be offered (250–500 mg b.d.)
- Urgent admission to hospital and antibiotic administration on development of infective symptoms
- Written patient information and a health alert card

*** Post operative vaccination give less than 50% antibody levels of those with preoprative vaccination.**

Thank You ☺

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