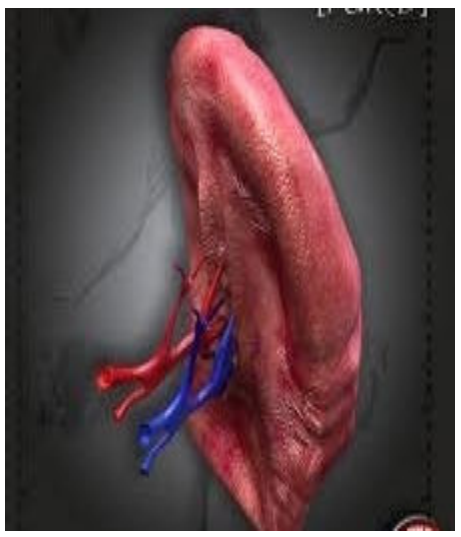
Spleen

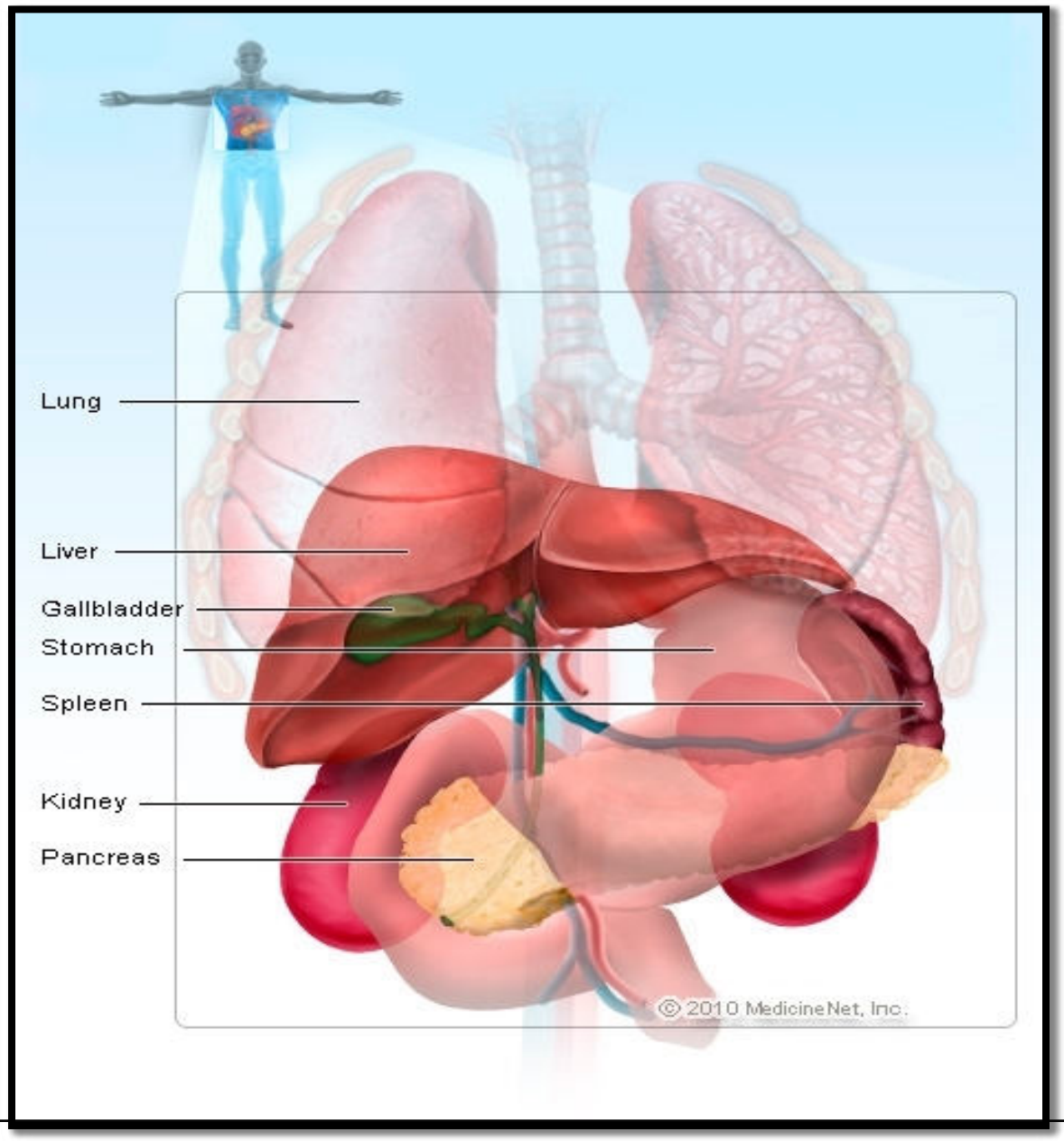


Dept of Surgery

Word "spleen" in English is "ill temper

Anatomy

- Largest reticuloendothelial organ in the body
- Intra-abdominal wedge shaped organ.
- Left hypochondrium & epigastrium.
- Soft , highly vascular.
- Variable size & weight
  - Average 12.5 X 7.5 X 2.5 in size
  - 150 -230 gm in weight.



- It derives most of its blood from the splenic artery
- Small amount from short gastric vessels
- Venous drainage: splenic vein

Total splenic inflow of blood is approximately 250 to 300 mL/min

Physiology

- Filtration
- Host defence
- Storage
- Hematopoiesis

Congenital Anomalies

Complete absence is rare

associated with other congenital abnormalities such as situs inversus and cardiac malformations.

Hypoplasia: more common finding

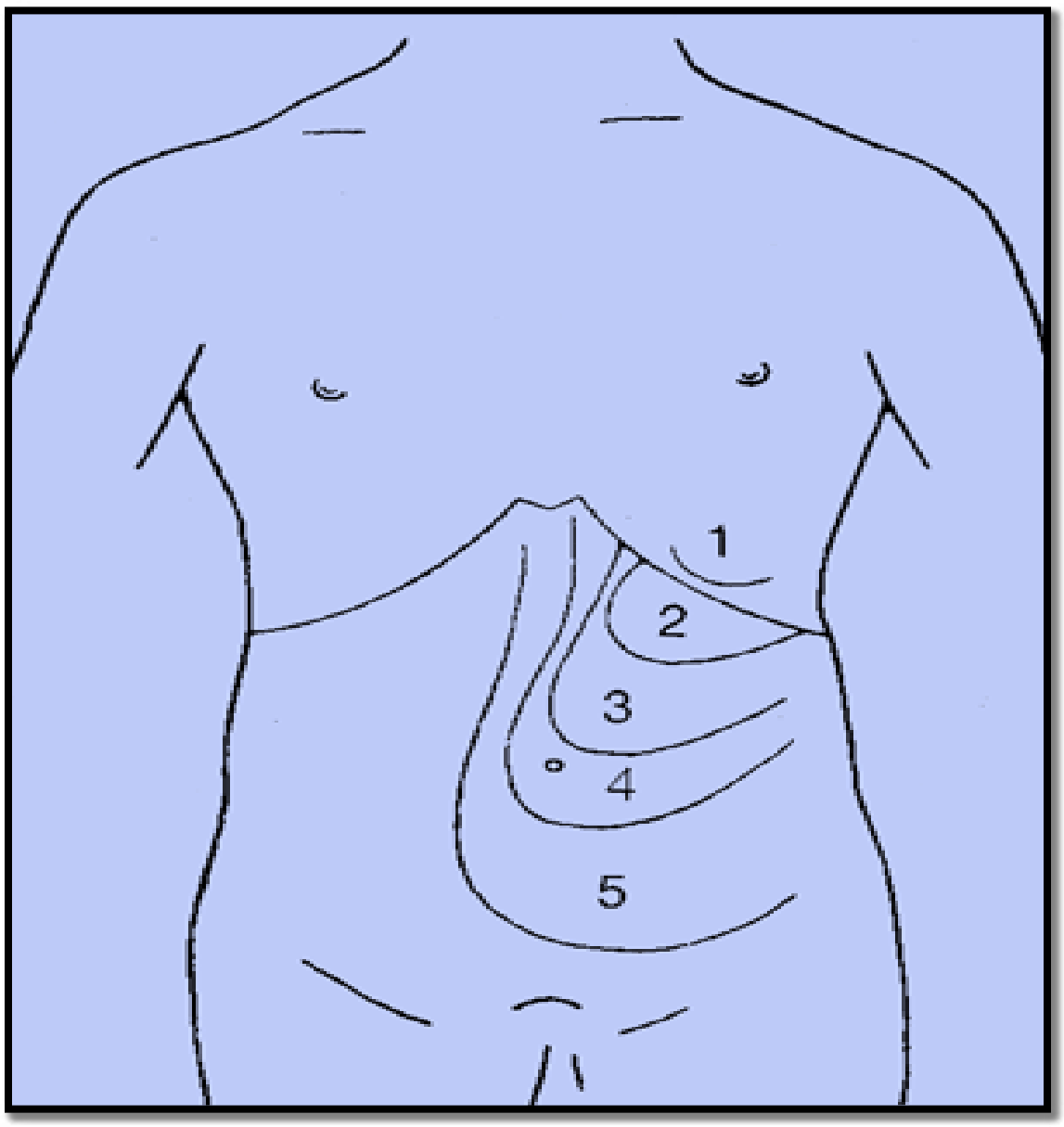
Accessory spleens (spleniculi) are common

Generally situated in the gastrosplenic ligament or the tail of the pancreas,omentum or mesenteries of the small or large intestine.

In splenectomy if an accessory spleen is overlooked, the benefit of removal of the definitive spleen can be lost

Splenomegaly

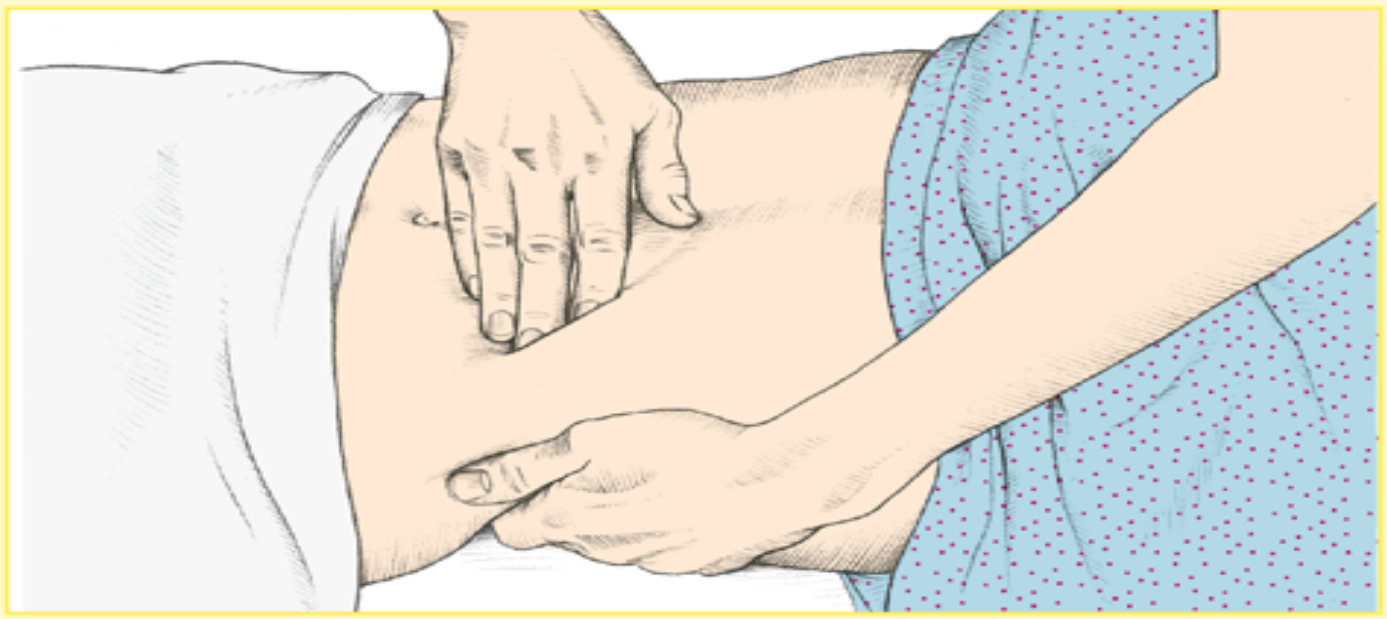
- Means enlargement of spleen.
- Normal spleen not palpable.
  - has to enlarge 2 time to be detectable.
- Enlarges from left hypochondrium to right illiac fossa.



How to palpate for splenomegaly

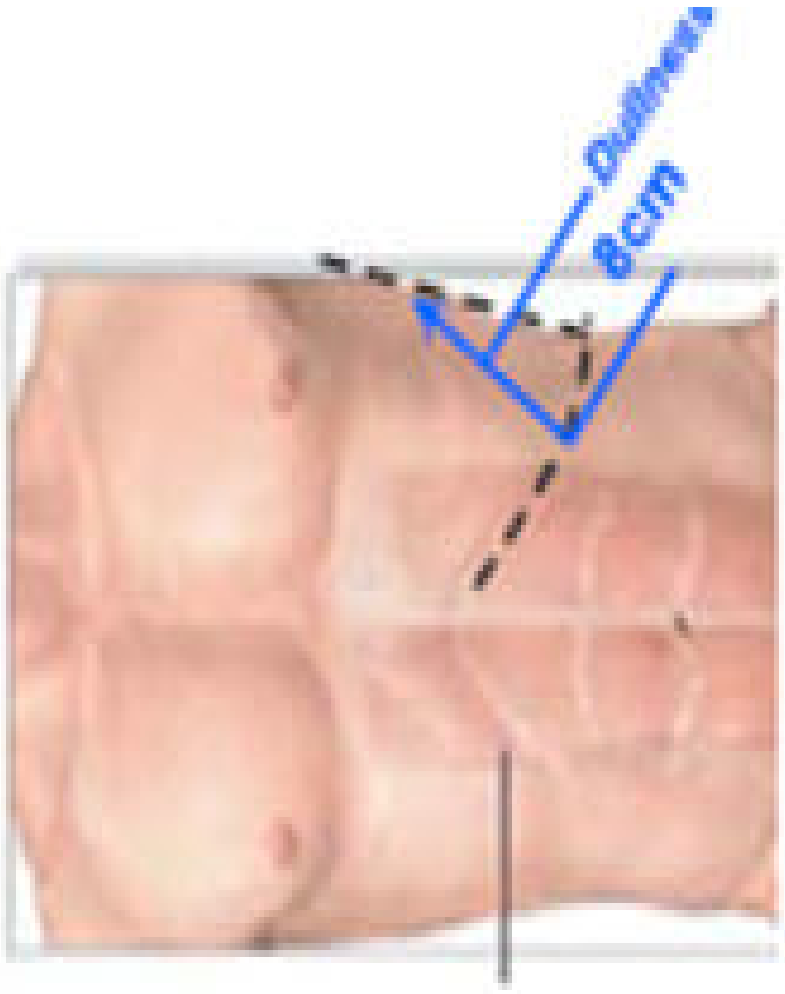
Detecting splenomegaly requires skillful and gentle palpation to avoid rupturing the enlarged spleen. Follow these steps carefully:

- Place the patient in the supine position, and stand at her right side. Place your left hand under the left costovertebral angle, and push lightly to move the spleen forward. Then press your right hand gently under the left front costal margin.
- Have the patient take a deep breath and then exhale. As she exhales, move your right hand along the tissue contours under the border of the ribs, feeling for the spleen's edge. The enlarged spleen should feel like a firm mass that bumps against your fingers. Remember to begin palpation low enough in the abdomen to catch the edge of a massive spleen.
- Grade the splenomegaly as slight (½" to 1½" [1 to 4 cm] below the costal margin), moderate (1½" to 3" [4 to 8 cm] below the costal margin), or great (greater than or equal to 3" [8 cm] below the costal margin).
- Reposition the patient on her right side with her hips and knees flexed slightly to move the spleen forward. Then repeat the palpation procedure.



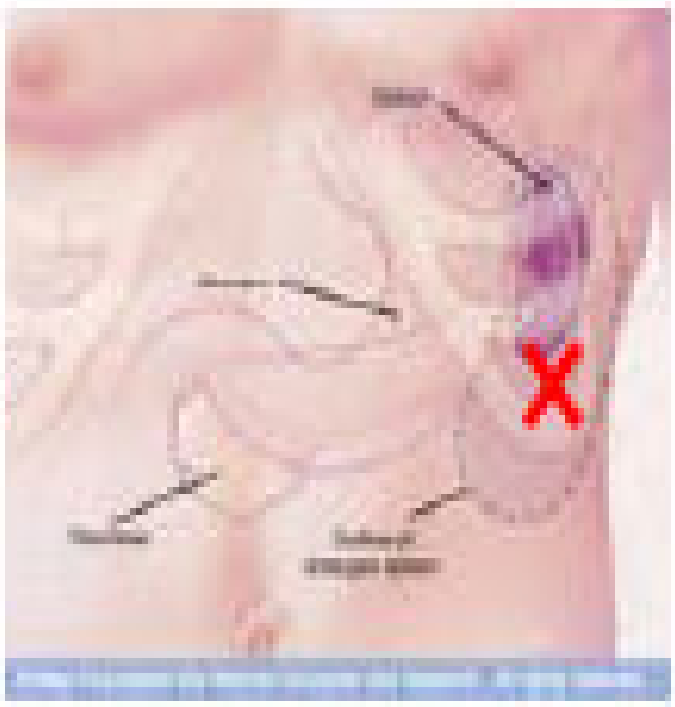
Examination

- Percussion
  - Nixon's Method
    - Right Lateral Decubitus
    - ≤8cm



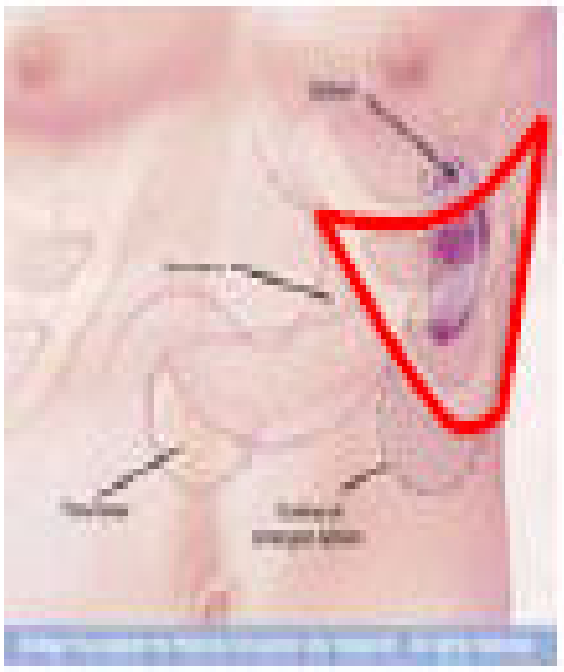
Examination

- Percussion cont
  - Castell's Method
    - Supine
    - Lowest intercostal space
    - Left anterior axillary line
    - Full inspiration and expiration
    - Splenomegaly = dullness



Examination

- Percussion cont
  - Traube's Space
    - Supine
    - 6th rib
    - Costal margin
    - Midaxillary line
    - Normal breathing
    - Splenomegaly = dullness



Classification Of Splenomegaly

- **Alotaibi G et al. classification** splenomegaly as:
  - Moderate : 11–20 cm
  - Severe : >20 cm

- Another classification acc. to extent below coastal margin:
  - Mild : <5 cm
  - Moderate : 5-8 cm
  - Severe : >8 cm

Splenomegaly Grading (Hacket's Grading)

0 Not Palpable

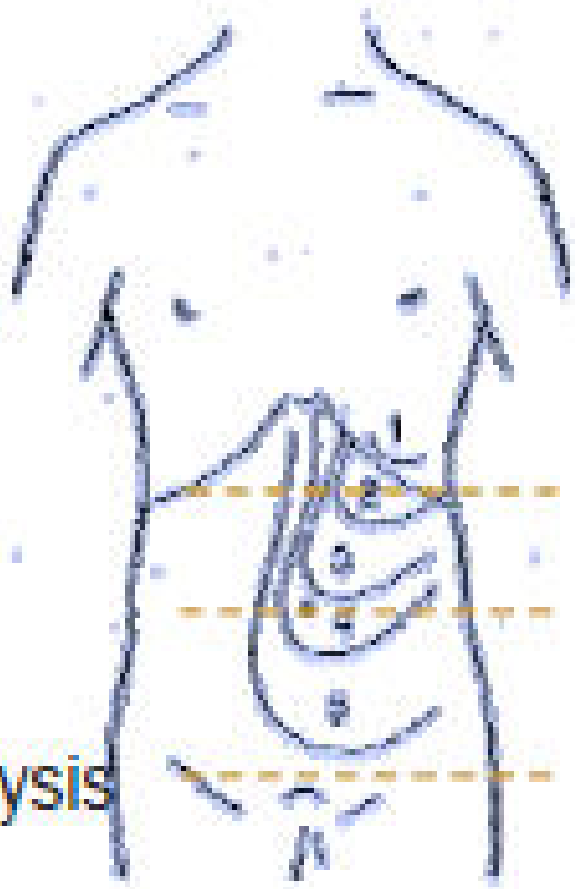
1 Palpable on deep inspiration

2 Palpable but <½ the way to the umbilicus

3 Not below the umbilicus

4 Below the umbilicus

5 >½ the way to the pubic symphysis



Pathology

Basically splenomegaly is due to:

- Increased function
- Abnormal blood flow
- Infiltration

Increased Function

Removal of defective RBCs

- Spherocytosis
- Thalassemia
- Hemoglobinopathies
- Nutritional anemias
- Early sickle cell anemia

Increased Function

Immune hyperplasia

- Response to infection (viral, bacterial, fungal,parasitic)
- mononucleosis, AIDS, viral hepatitis
- subacute bacterial endocarditis, bacterial septicemia
- splenic abscess, typhoid fever
- brucellosis, leptospirosis, tuberculosis
- histoplasmosis
- ~~malaria, leishmaniasis, trypanosomiasis~~

Increased Function

Immune hyperplasia

- *Disordered immunoregulation*
- Rheumatoid arthritis
- Systemic lupus erythematosus
- Serum sickness
- Autoimmune hemolytic anemia
- Sarcoidosis

Increased Function

Extramedullary hematopoiesis

- Myelofibrosis
- marrow infiltration by tumors, leukemias
- marrow damage by radiation, toxins

Abnormal Blood Flow

Organ Failure

- cirrhosis

Vascular

- hepatic vein obstruction
- portal vein obstruction
- Budd–Chiari syndrome
- splenic vein obstruction

Infiltration

Metabolic diseases

- Gauchers disease
- Niemann–pick disease
- Hurler syndrome
- Mucopolysaccharidoses
- Amyloidosis

Infiltration

Benign and malignant "infiltrations"

- leukemias (acute, chronic, lymphoid, and myeloid)
- lymphomas (Hodgkins and non-Hodgkins)
- myeloproliferative disease
- metastatic tumors (commonly melanoma)
- histiocytosis X
- hemangioma, lymphangioma
- splenic cysts
- hamartomas

Mild Splenomegaly

- Malaria
- Typhoid
- Disseminated TB
- Viral hepatitis
- Septicemia
- Thalessemia minor
- HIV

Moderate Splenomegaly

- Cirrhosis
- Lymphomas
- Leukaemia
- Infectious mononeucleosis
- Hemolytic anemia
- Splenic abcess
- Amylodosis
- hemochromatosis

Severe Splenomegaly

- Chronic malaria
- Kala azar
- CML
- Portal hypertension
- Thalessemia major
- Infiltrative & metabolic disorders

Management

Depends on cause

Various investigations as per clinical features & epidemiology are employed

Basic investigations done are:

- CBC
- USG
- CECT scan

Treatment

- Can be medical or surgical
- Medical management involves treatment of cause if possible
- Surgical treatment is splenectomy

Indications Of Splenectomy

- Trauma : splenic rupture (MC)
- ITP
- Hemolytic anemias
- CLL, Lymphomas
- Primary Myelofibrosis
- Tropical splenomegaly

Preoperative Considerations

- Splenic Artery Embolization
- Vaccination
- Deep Venous Thrombosis Prophylaxis

Splenectomy Techniques

- Open Splenectomy Technique
- Laparoscopic Splenectomy
- Partial Splenectomy

Complications

- Pulmonary

  Left lower lobe atelectasis, pleural effusion, pneumonia

- Hemorrhagic
- Infectious

  Subphrenic abscess. Wound infection

- Pancreatic

  Pancreatitis, pseudocyst, pancreatic fistula

- Thromboembolic

Overwhelming Post splenectomy Infection (OPSI)

- loss of the ability to filter and phagocytose bacteria
- loss of a significant source of antibody production
- MC source of infection:*Streptococcus pneumoniae*
- *Others: H.influenzae* type B, meningococcus, group A streptococci , Babesia microti

Recommendations for vaccination of patients with hyposplenism.

Vaccine	Time of vaccination	Revaccination schedule	Comments
1 Pneumoccal polyvalent vaccine	If possible, at least 2 weeks prior to splenectomy	5 yearly	Assessment of antibody response may be useful
2 Combined *Haemophilus influenzae* type b conjugate and meningococcal C conjugate	Alternatively, 2 weeks post-splenectomy for all three vaccines	Not required Not required	Not required if previously vaccinated
3 Influenza	As soon as available for seasonal protection	Annual	Inactivated subunit vaccine