

SPLEEN

1) Hypersplenism.

Hypersplenism is a clinical syndrome characterized by:

- Splenomegaly, although this may be only moderate
- Pancytopenia or a reduction in the number of one or more types of blood cells, neutropenia is less common than anemia and thrombocytopenia
- Normal production or hyperplasia of the precursor cells in the marrow or a so called maturation arrest
- Decreased red blood cells survival and
- Decreased platelet survival.

2) Causes of Splenomegaly & hypersplenism:

Infectious causes:

- Viral infection: infectious mononucleosis, viral hepatitis, and HIV infection.
- Bacterial infection: enteric fever, bacterial endocarditis, brucellosis, and Tuberculosis.
- Parasitic infections: malaria, visceral leishmaniasis, and schistosomiasis
- Fungal infections: histoplasmosis

Hyperplastic splenomegaly: Hereditary spherocytosis, symptomatic elliptocytosis, thalassaemia, polycythaemia Rubra vera, myelofibrosis, and Chronic myeloid leukaemia, Chronic Lymphocytic leukaemia and Lymphoma.

Congestive splenomegaly: Liver cirrhosis, hepatic schistosomiasis "portal hypertension", hepatic vein obstruction, portal vein obstruction, splenic vein obstruction, congestive heart failure with increased venous pressure, and splenic artery aneurysm.

Infiltrative splenomegaly: Gaucher's disease, amyloidosis, Niemann-pick disease, histiocytosis, splenic tumours and metastatic malignancy, Marfan's disease and Waldenstrom macroglobulinaemia.

Miscellaneous causes: Connective tissue disorders. Idiopathic non tropical splenomegaly, iron deficiency anaemia, B12 deficiency, thyrotoxicosis, Berylliosis.
Diagnosis of hypersplenism:

Clinical findings:

The symptoms are of 3 types:

1. Symptoms related to the enlarged spleen such as abdominal fullness associated with feeling of heaviness and discomfort and pain in the left upper quadrant of the abdomen.

2. Haematological symptoms: Symptoms related to thrombocytopenia are common, such as, bruising and epistaxis. Symptoms related to anaemia are fatigue, weakness and pallor. Leucopenia leads to recurrent infections and oral ulcerations.
3. Symptoms and signs of the underlying diseases.

Investigations:

- i. Laboratory findings: Anaemia, thrombocytopenia and leucopenia.
- ii. Evaluation of splenic size: with physical examination, abdominal Ultrasonography, CT and MRI.
- iii. Evaluation of splenic function: reduced red cell or platelet survival can be measured by labelling the patient's cells with Cr51, or the platelets with indium and measuring the rate of disappearance of radioactivity from the blood.

The diagnosis of hypersplenism is ultimately confirmed by response to splenectomy, although an immediate remission may be followed in the longer term by relapse with return of cytopenia.

Points to remember

- Hypersplenism is a triad of splenomegaly, pancytopenia and normocellular bone marrow.
- Splenomegaly due to any cause can lead to hypersplenism, but Portal hypertension and hematological disorders are the commonest causes of hypersplenism.
- No direct relation between splenic size and hypersplenism, however hypersplenism is more common among those who have gross splenomegaly.
- Differential diagnosis of gross splenomegaly includes Portal hypertension, visceral leishmaniasis, Tropical splenomegaly syndrome, Gaucher disease in addition to myeloproliferative and lymphoproliferative disorders.
- Treatment of the underlying disease is best option for control of hypersplenism, however splenectomy and splenic embolization can be indicated in some patients.

3) Indications for splenectomy

- Trauma
 - Accidental
 - Operative
- Oncological
 - Part of en bloc resection

- Diagnostic
- Therapeutic
- Haematological
 - Spherocytosis
 - Purpura (ITP)
 - Hypersplenism
- Portal hypertension
 - Variceal surgery

4) Complications of splenectomy.

Answer.

General complications:

- Bleeding.
- Wound infection.

Immediate complications specific to splenectomy:

- Haemorrhage resulting from a slipped ligature.
- Haematemesis from gastric mucosal damage and gastric dilatation is uncommon.
- Left basal atelectasis is common, and a pleural effusion may be present.
- Adjacent structures at risk during the procedure include the stomach and pancreas.
 - A fistula may result from damage to the greater curvature of the stomach during ligation of the short gastric vessels.
 - Damage to the tail of the pancreas may result in pancreatitis, a localised abscess or a pancreatic fistula.
- Postoperative thrombocytosis may arise and, if the blood platelet count exceeds $1 \times 10^6/\text{mL}$, prophylactic aspirin is recommended to prevent axillary or other venous thrombosis.
- Post-splenectomy septicaemia may result from *Streptococcus pneumoniae*, *Neisseria meningitidis*, *Haemophilus influenzae* and *Escherichia coli*.
The risk is greater in the young patient, in splenectomised patients treated with chemoradiotherapy and in patients who have undergone splenectomy for thalassaemia, sickle cell disease and autoimmune anaemia or thrombocytopenia.
- Opportunist post-splenectomy infection (OPSI) is a major concern. Published guidelines emphasise that most infections after splenectomy could be avoided through measures that include offering patients appropriate and timely immunisation, antibiotic prophylaxis, education and prompt treatment of infection.
 - All patients with compromised immune function should receive prophylaxis. Satisfactory oral prophylaxis can be obtained with penicillin, erythromycin or amoxicillin, or co-amoxiclav.

- Suspected infection can be treated intravenously with these same antibiotics and cefotaxime, ceftriaxone or chloramphenicol in patients allergic to penicillin and cephalosporins.
- If elective splenectomy is planned, consideration should be given to vaccinating against pneumococcus, meningococcus C (both repeated every five years) and *H.influenza* type B (Hib) (repeated every ten years).
- *Haemophilus influenzae* type b vaccination is recommended irrespective of age.
- Patients who have undergone splenectomy and are travelling to countries where malaria is present are strongly advised to use all physical anti-mosquito barriers, as well as anti-malarial therapy, since they are at increased risk of severe malaria.
- Overwhelming post-splenectomy sepsis due to *Capnocytophaga canimorsus* may result from dog, cat or other animal bites.
- In the trauma victim, vaccination can be given in the postoperative period, and the resulting antibody levels will be protective in the majority of cases.

5) OPSI.

Answer. Opportunist/Overwhelming post-splenectomy infection (OPSI) is a major concern. Published guidelines emphasise that most infections after splenectomy could be avoided through measures that include offering patients appropriate and timely immunisation, antibiotic prophylaxis, education and prompt treatment of infection.

- All patients with compromised immune function should receive prophylaxis.
- Satisfactory oral prophylaxis can be obtained with penicillin, erythromycin or amoxicillin, or co-amoxiclav.
- Suspected infection can be treated intravenously with these same antibiotics and cefotaxime, ceftriaxone or chloramphenicol in patients allergic to penicillin and cephalosporins.
- If elective splenectomy is planned, consideration should be given to vaccinating against pneumococcus, meningococcus C (both repeated every five years) and *H.influenza* type B (Hib) (repeated every ten years).
- *Haemophilus influenzae* type b vaccination is recommended irrespective of age.
- Patients who have undergone splenectomy and are travelling to countries where malaria is present are strongly advised to use all physical anti-mosquito barriers, as well as antimalarial therapy, since they are at increased risk of severe malaria.
- Overwhelming post-splenectomy sepsis due to *Capnocytophaga canimorsus* may result from dog, cat or other animal bites.
- Babesia micortii infection though rare can happen.
- In the trauma victim, vaccination can be given in the postoperative period, and the resulting antibody levels will be protective in the majority of cases.