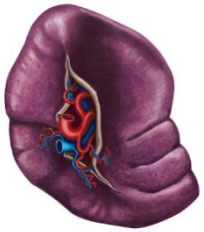
الجامعة السورية الخاصة

كلية الطب

قسم الجراحة



الطحال

The Spleen

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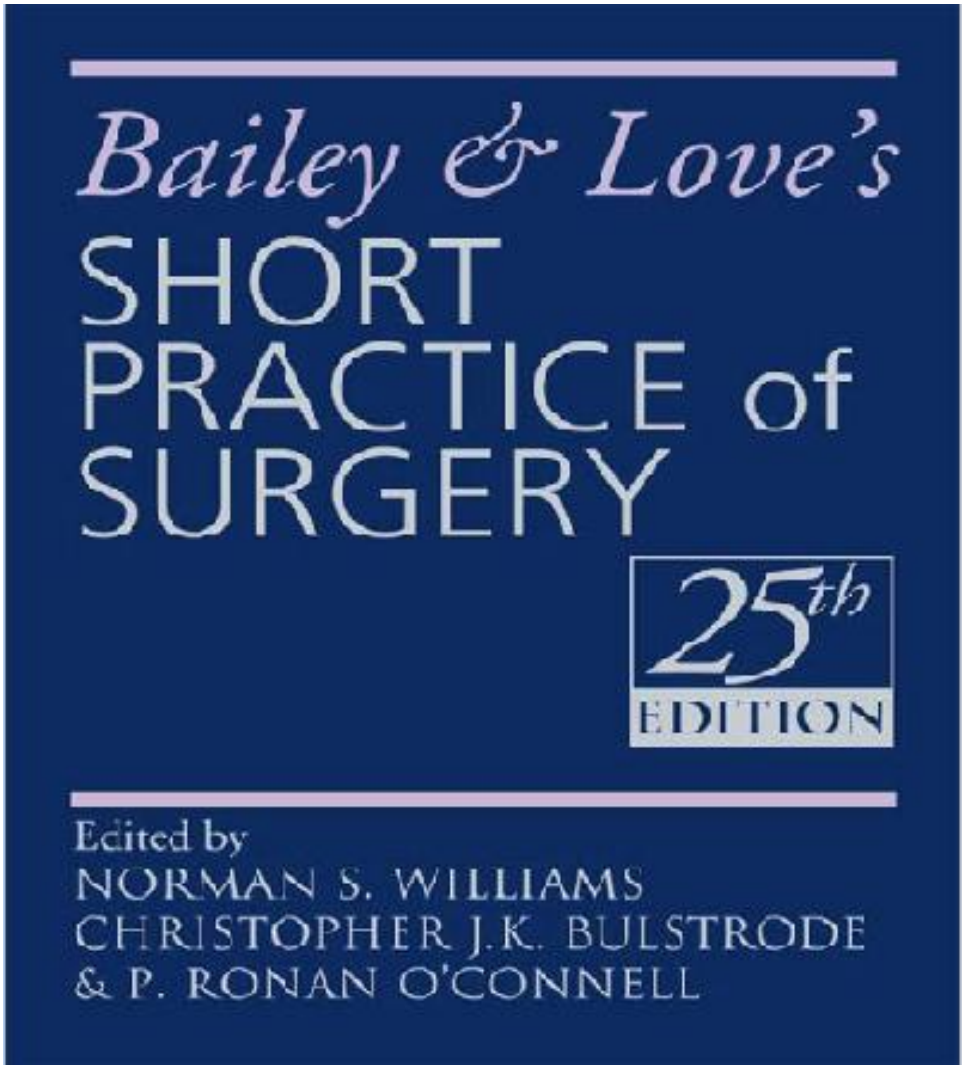
2017-2018

الكتاب المرجعي في الجراحة



LEARNING OBJECTIVES

To understand:

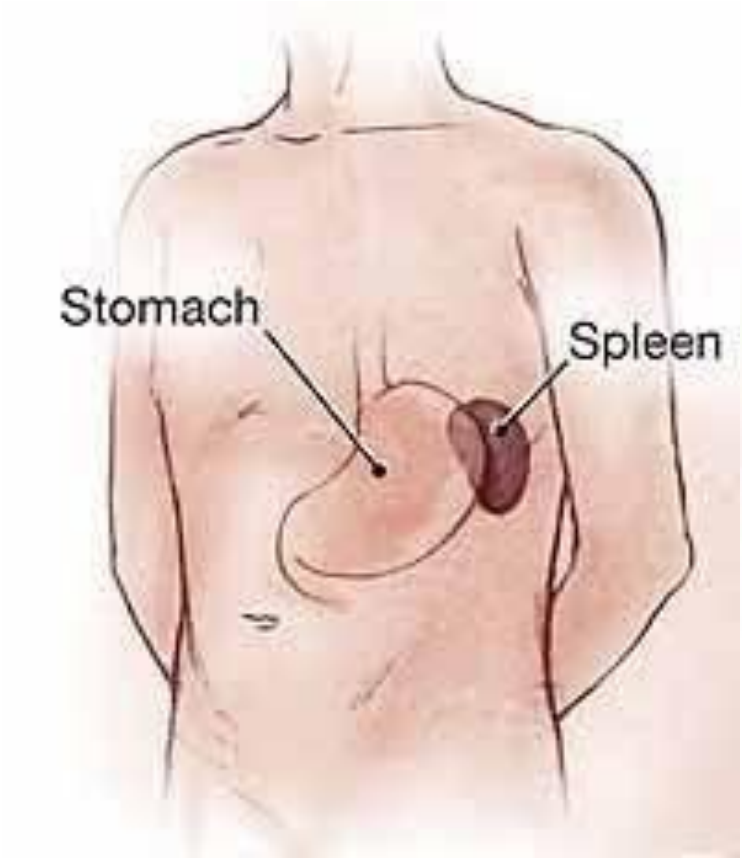
- The function of the spleen
- The common pathologies involving the spleen
- The principles and potential complications of splenectomy
- The potential advantages of laparoscopic splenectomy
- The importance of prophylaxis against infection following splenectomy

EMBRYOLOGY

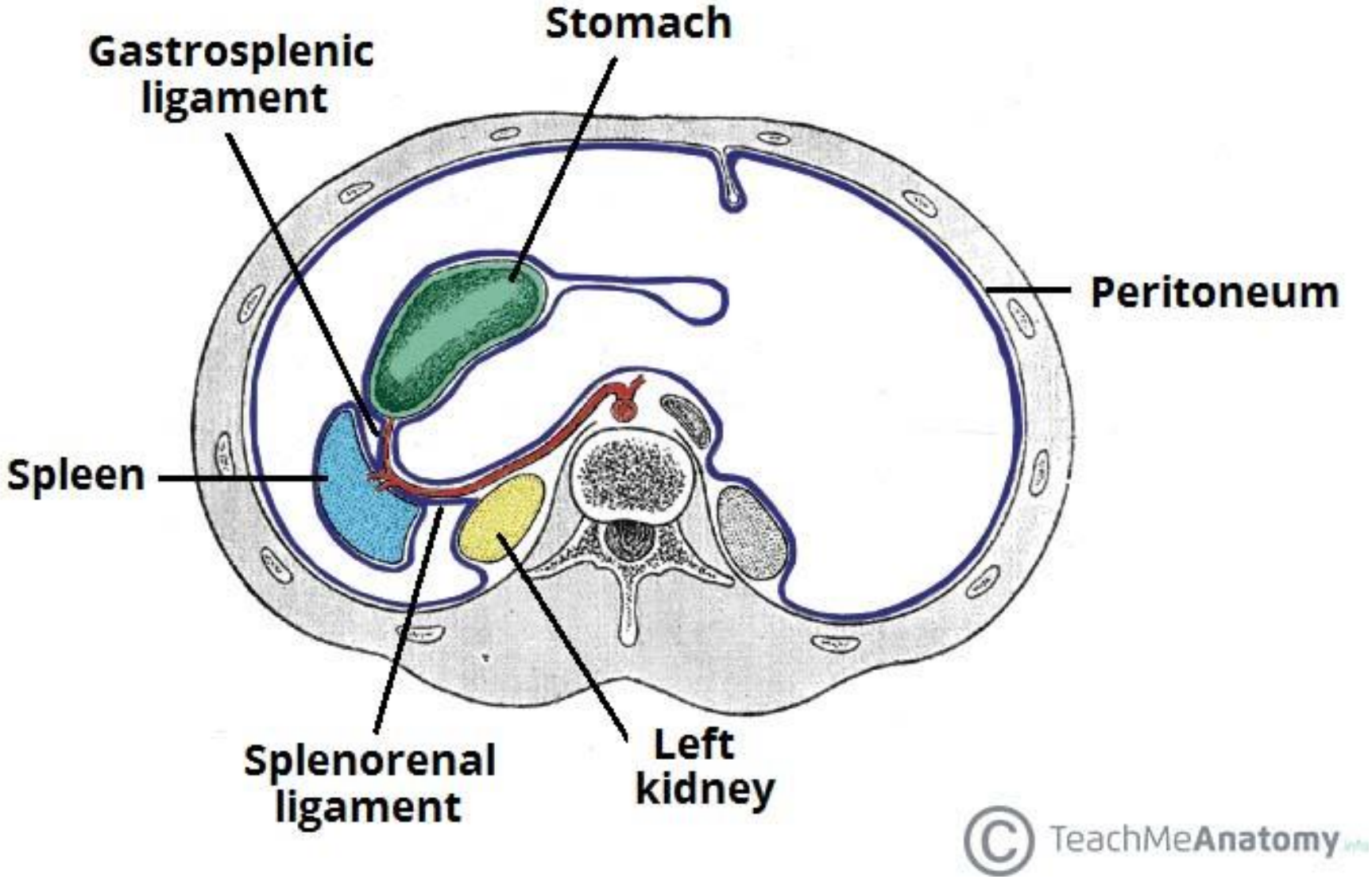
- Fetal splenic tissue develops from condensations of mesoderm in the dorsal mesogastrium.

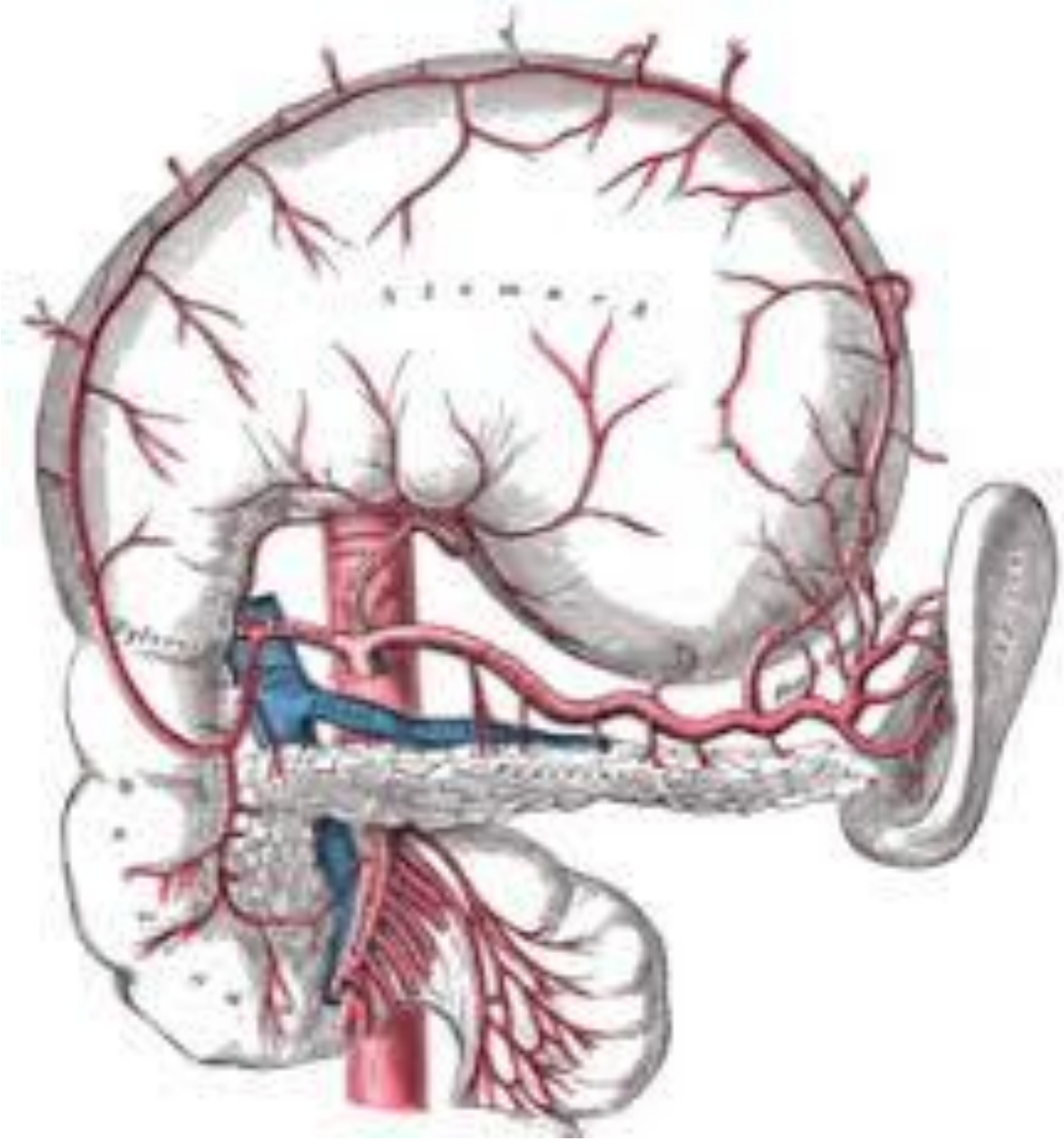
Anatomy

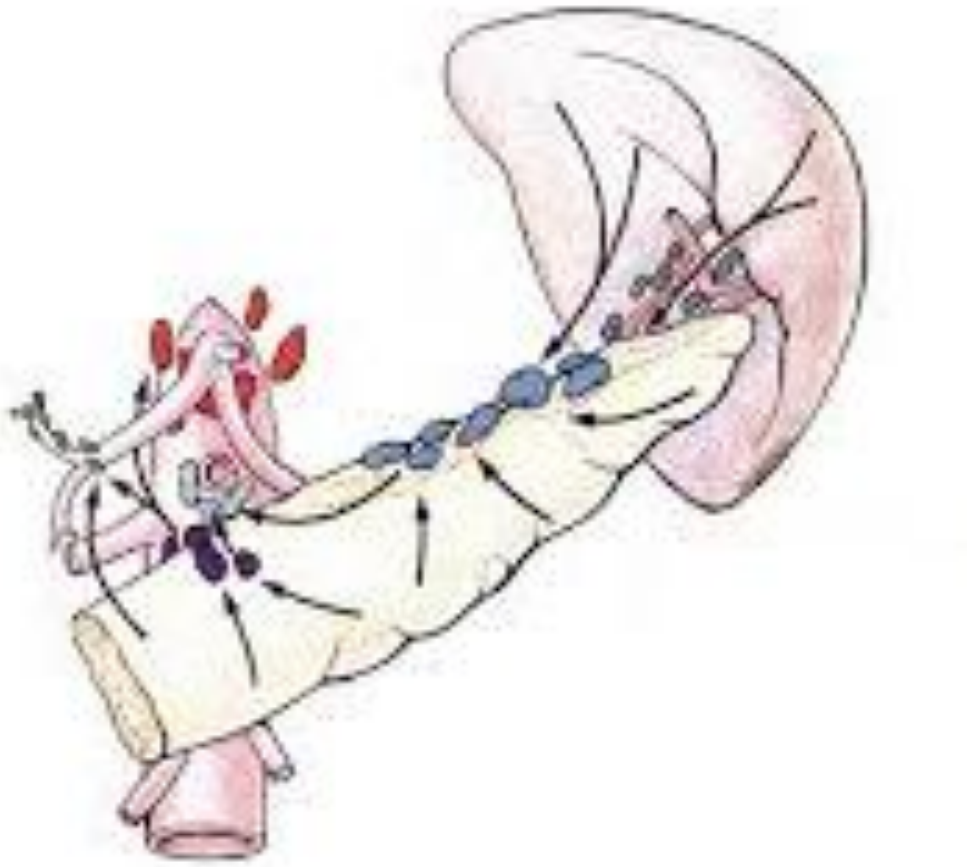
- The weight of the normal adult spleen is 75–250 g.
- It lies in the left hypochondrium between the gastric fundus and the left hemidiaphragm
- its long axis lying along the 10th rib
- The hilum sits in the angle between the stomach and the kidney
- The hilum is in contact with the tail of the pancreas
- The tortuous splenic artery arises from the coeliac axis ilum.
- The lymphatic drainage efferent vessels run with the arterioles and emerge from nodes at the hilum.


Stomach
Spleen

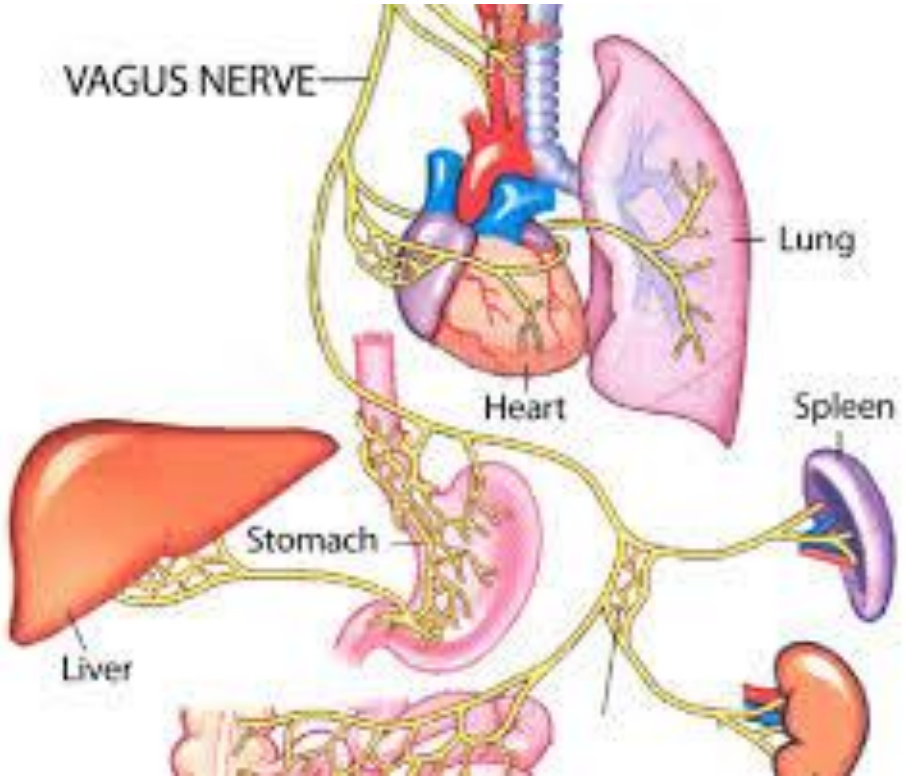

Liver
Spleen


Gastrosplenic ligament
Stomach
Peritoneum
Spleen
Splenorenal ligament
Left kidney
© TeachMeAnatomy





Spleen Lymphatic Drainage



Sympathetic nerve fibres run from the coeliac plexus and innervate splenic arterial branches.

Physiology (White pulp)

- The splenic parenchyma consists of white and red pulp that is surrounded by serosa and a collagenous capsule with smooth muscle fibres.
- The white pulp comprises a central artery surrounded by nodules with germinal centres and periarterial lymphatic sheaths filled with lymphocytes and macrophages.
- Plasma-rich blood that has passed through the central lymphatic nodules, and particles are phagocytosed.

Physiology (Red Pulp)

- Cellconcentrated blood passes in the trabecular artery through the centre of the white pulp to the red pulp cords.
- Red cells pass from the cords to the sinuses, a process that removes abnormally shaped cells from the circulation.
- The overall flow rate is about 300 ml/ min.

FUNCTIONS OF THE SPLEEN

The surgeon should normally endeavour to preserve the spleen to maintain the following functions:

- Immune function.
- Filter function.
- Pitting.
- Reservoir function.
- Cytopoiesis.

Immune function.

These antibodies are of B- and T-cell origin and bind to the specific receptors on the surface of macrophages and leucocytes, stimulating their phagocytic, bactericidal and tumoricidal activity.

Filter function.

- Macrophages in the reticulum capture cellular and non-cellular material from the blood and plasma.
- Removal of effete platelets and red blood cells.
- Iron is removed from the degraded haemoglobin during red cell breakdown and is returned to the plasma.
- Removed non-cellular material may include bacteria and, in particular, pneumococci.

Pitting

- Particulate inclusions from red cells are removed.
- nuclear remnants and precipitated haemoglobin or globin subunits.

Reservoir function

- This function is less marked than in other species.
- The spleen does contain approximately 8% of the red cell mass.
- An enlarged spleen may contain a much larger proportion of the blood volume.

Cytopoiesis

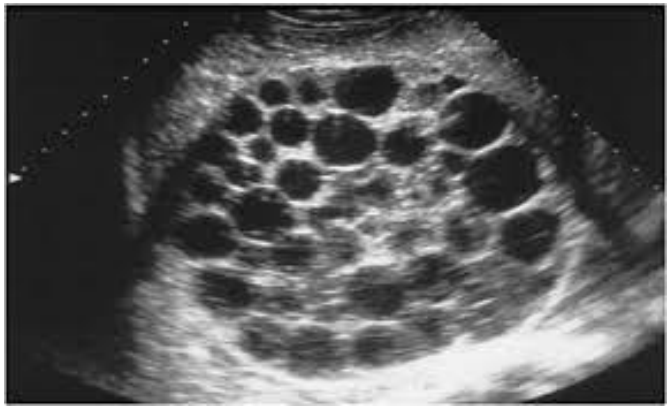
- From the fourth month of intrauterine life, some degree of haemopoiesis occurs in the fetal spleen.
- Stimulation of the white pulp may occur following antigenic challenge, resulting in the proliferation of T and B cells and macrophages.
- This may also occur in myeloproliferative disorders, thalassaemias and chronic haemolytic anaemias.

INVESTIGATION OF THE SPLEEN

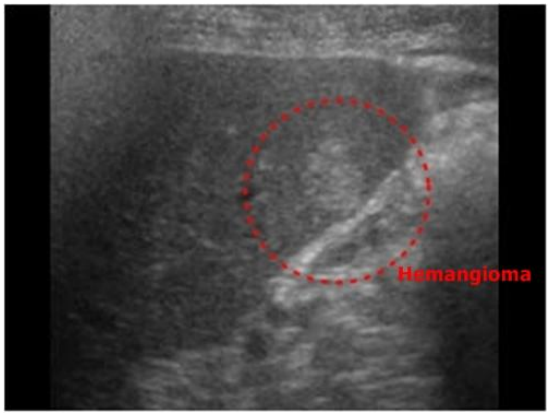
- Blood tests in general.
- Ultrasound.
- Radiological imaging.
- Computerised tomography (CT) scan.
- Magnetic resonance image (MRI) scanning.
- Radioisotope scanning is used occasionally to provide information about the spleen using Technetium-99m (99mTc)-labelled colloid.

Ultrasound of Spleen

Enlarged Spleen

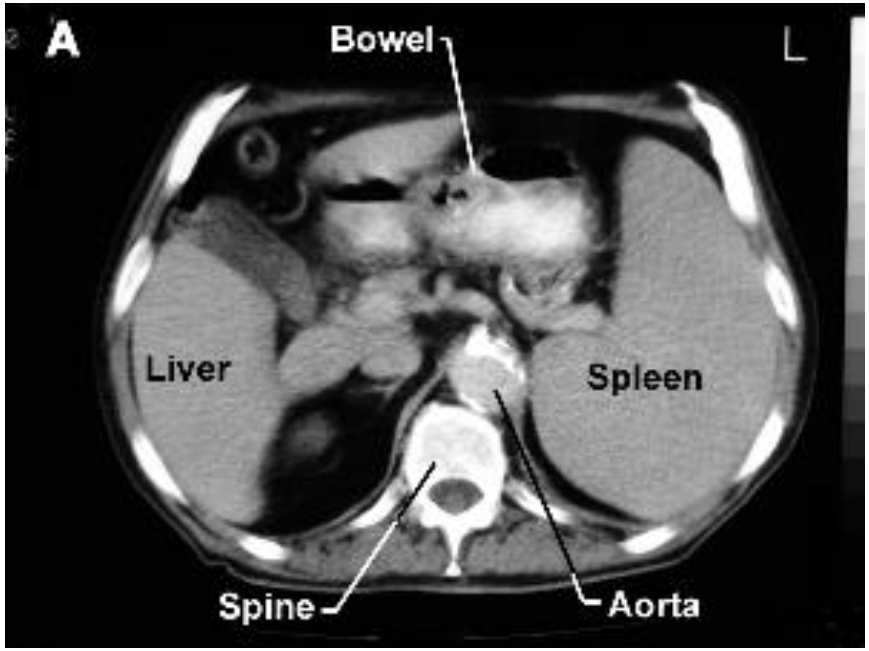


Hydatid Cyst of Spleen
Daughter Cysts

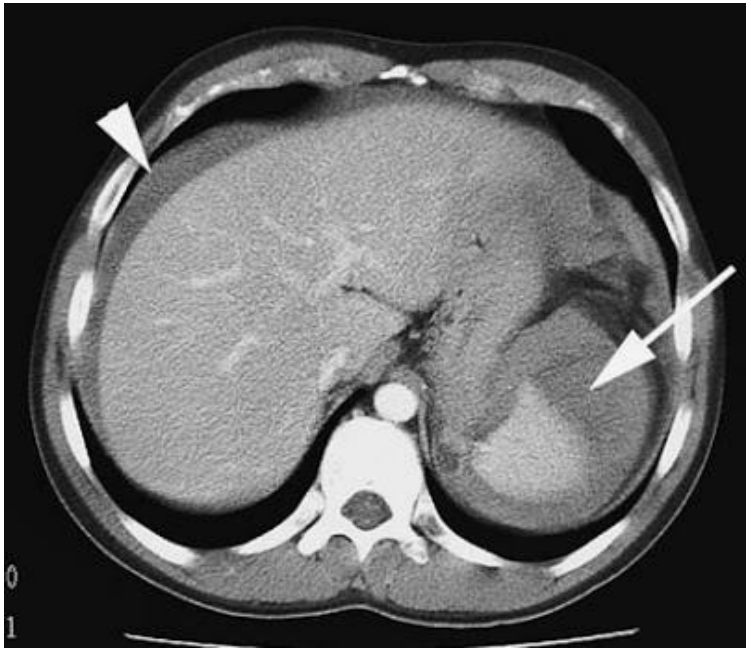


Hemangioma in Spleen

Computerized tomography (CT) scan



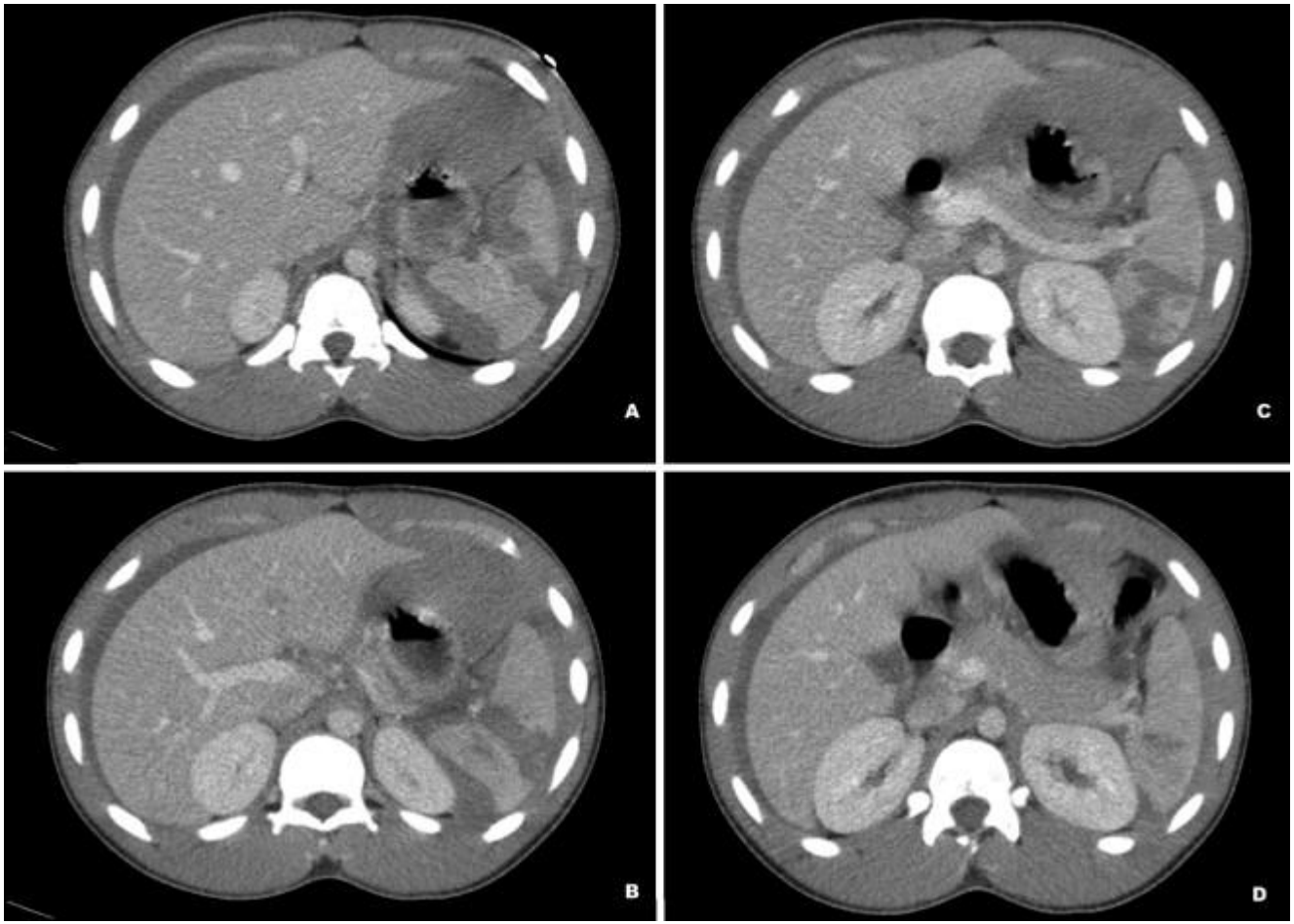
splenomegaly (enlarged spleen)



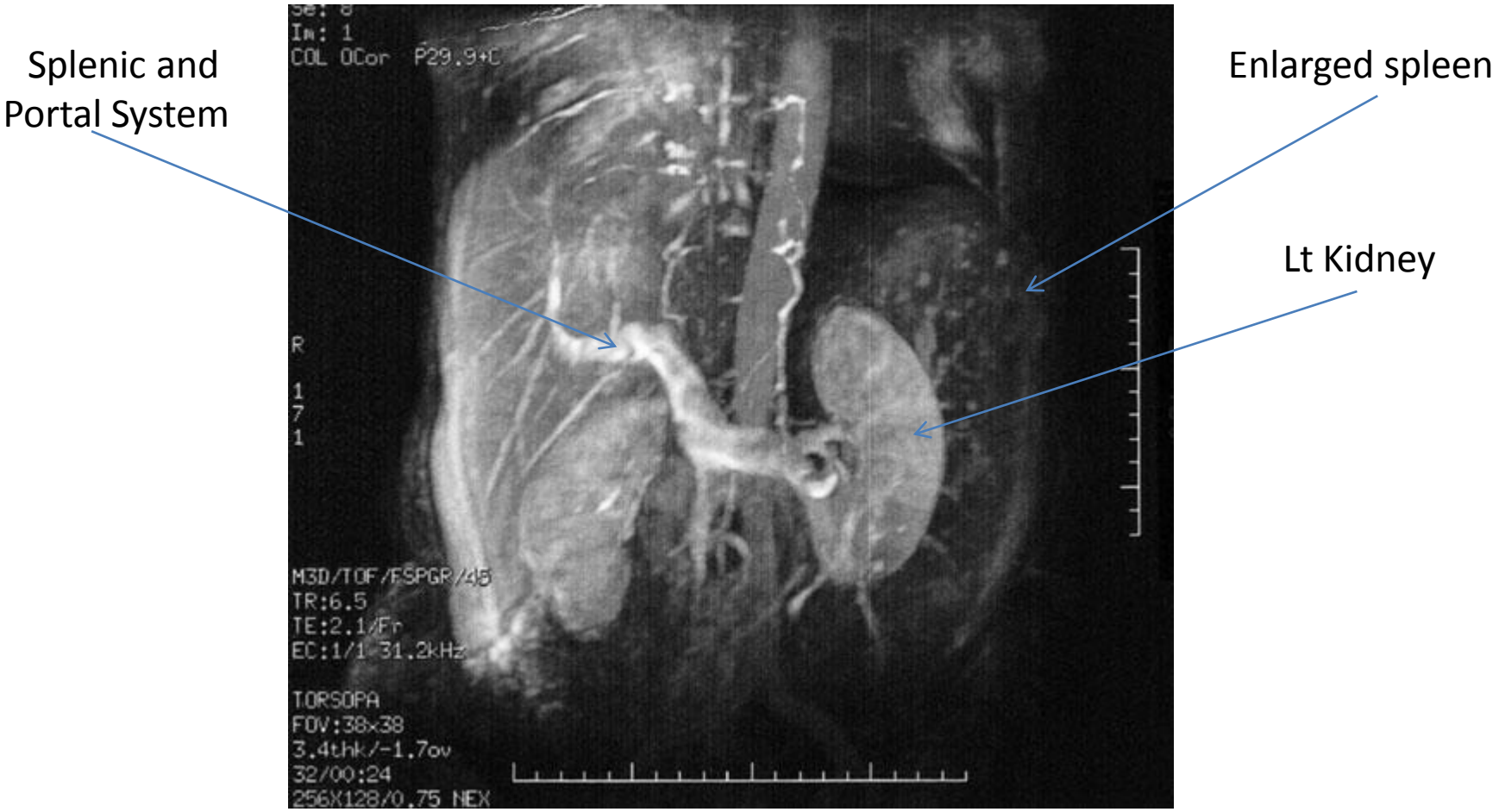
Rupture of the spleen.

by blunt trauma

Magnetic resonance image (MRI)scanning



Rare case of splenic pseudoaneurysim



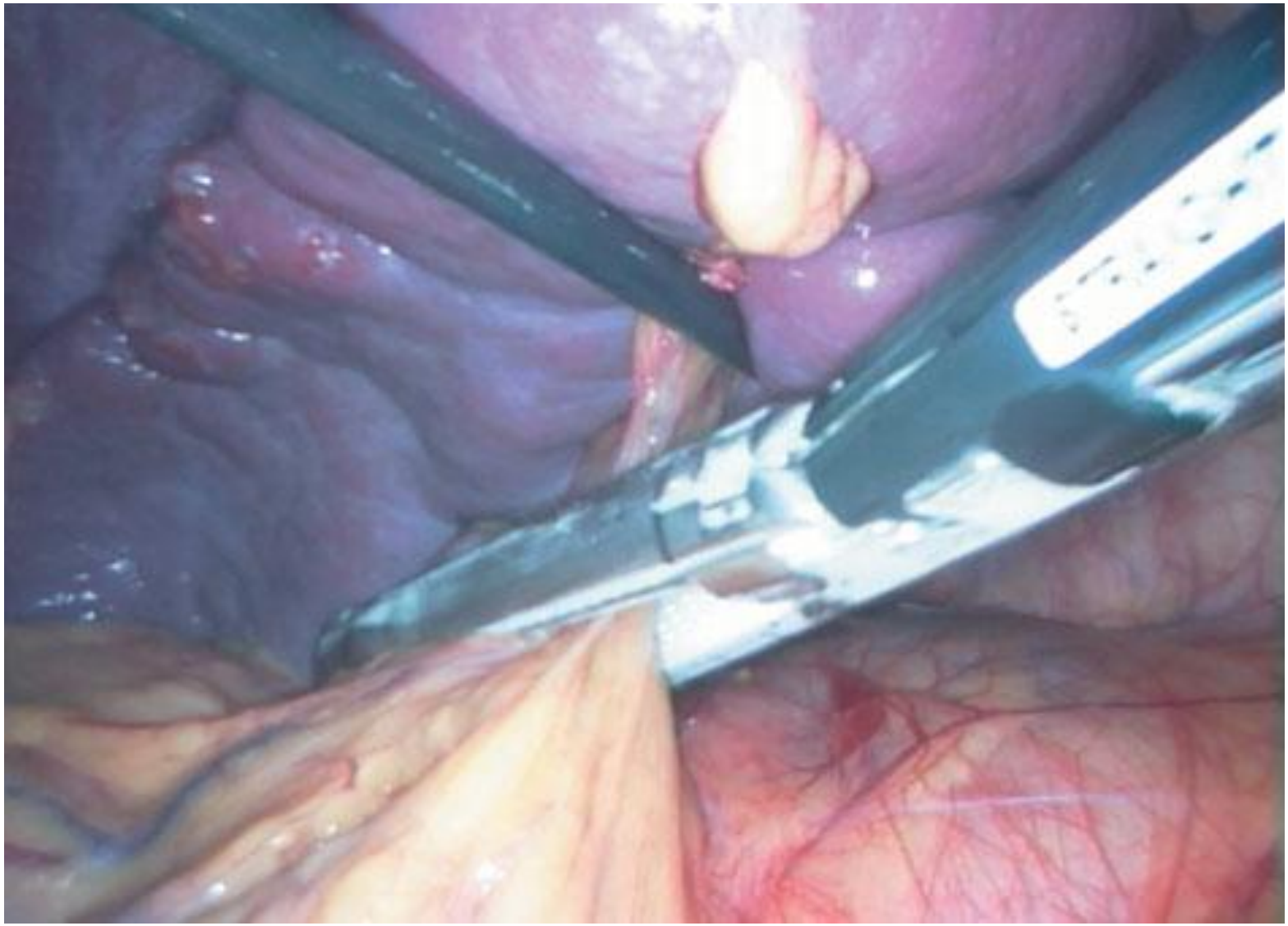
(MRI) scan showing massive hepatosplenomegaly secondary to myelofibrosis.

Indications for splenectomy

- Trauma Accidental
- Operative
- Oncological
- Part of en bloc resection
- Diagnostic : Staging Laparatomy .
- Therapeutic
- Haematological Spherocytosis
- Purpura (ITP)
- Hypersplenism
- Portal hypertension
- Variceal surgery

Preoperative preparation

- Coagulation profiles should be as near normal as possible at operation.
- In the presence of a bleeding tendency, transfusion of blood, fresh-frozen plasma, cryoprecipitate or platelets may be required.
- Platelets should be available for patients with thrombocytopenia at operation and in the early postoperative period.
- Antibiotic prophylaxis appropriate to the operative procedure should be given, and consideration should be given to the risk of post-splenectomy sepsis.



Laparoscopic Splenectomy

Postoperative complications 1

Immediate complications

1. Haemorrhage.
2. Haematemesis from gastric mucosal damage and.
3. Gastric dilatation is uncommon.
4. Left basal atelectasis is common, and a pleural effusion.
5. Adjacent structures at risk during the procedure include the stomach and pancreas.
6. A fistula may result from damage to the greater curvature of the stomach during ligation of the short gastric vessels.
7. Damage to the tail of the pancreas and pancreatitis.
8. The blood platelet count may rise and, if this exceeds $1 \times 10_6$ ml. prophylactic aspirin is recommended.

Postoperative complications 2

Post-splenectomy

1. Septicaemia.
2. Hazard of infection from : *Streptococcus pneumoniae, Neisseria meningitides, Haemophilus influenzae and Escherichia coli.*
3. *Opportunist post-splenectomy infection (OPSI).*

Guide Lines 1

- It is thought that children who have undergone splenectomy before the age of 5 years should be treated with a daily dose of penicillin until the age of 10 years.
- Prophylaxis in older children should be continued at least until the age of 16 years.

Guide Lines2 Vaccination

- If elective splenectomy is planned, consideration should be given to vaccinating against pneumococcus, meningococcus (both repeated every 5 years) and H. influenzae (repeated every 10 years).
- Yearly influenza vaccination has been recommended as there is some evidence that it may reduce the risk of secondary bacterial infection.
- Pneumococcal vaccination is recommended in those patients aged over 2 years.
- Haemophilus influenzae type b vaccination is recommended irrespective of age.

Remember

Splenectomy

- Remember preoperative immunisation.
- Prophylactic antibiotics in the long term.
- OPSI is a real clinical danger.

تصبحوا على خير