SPLEEN

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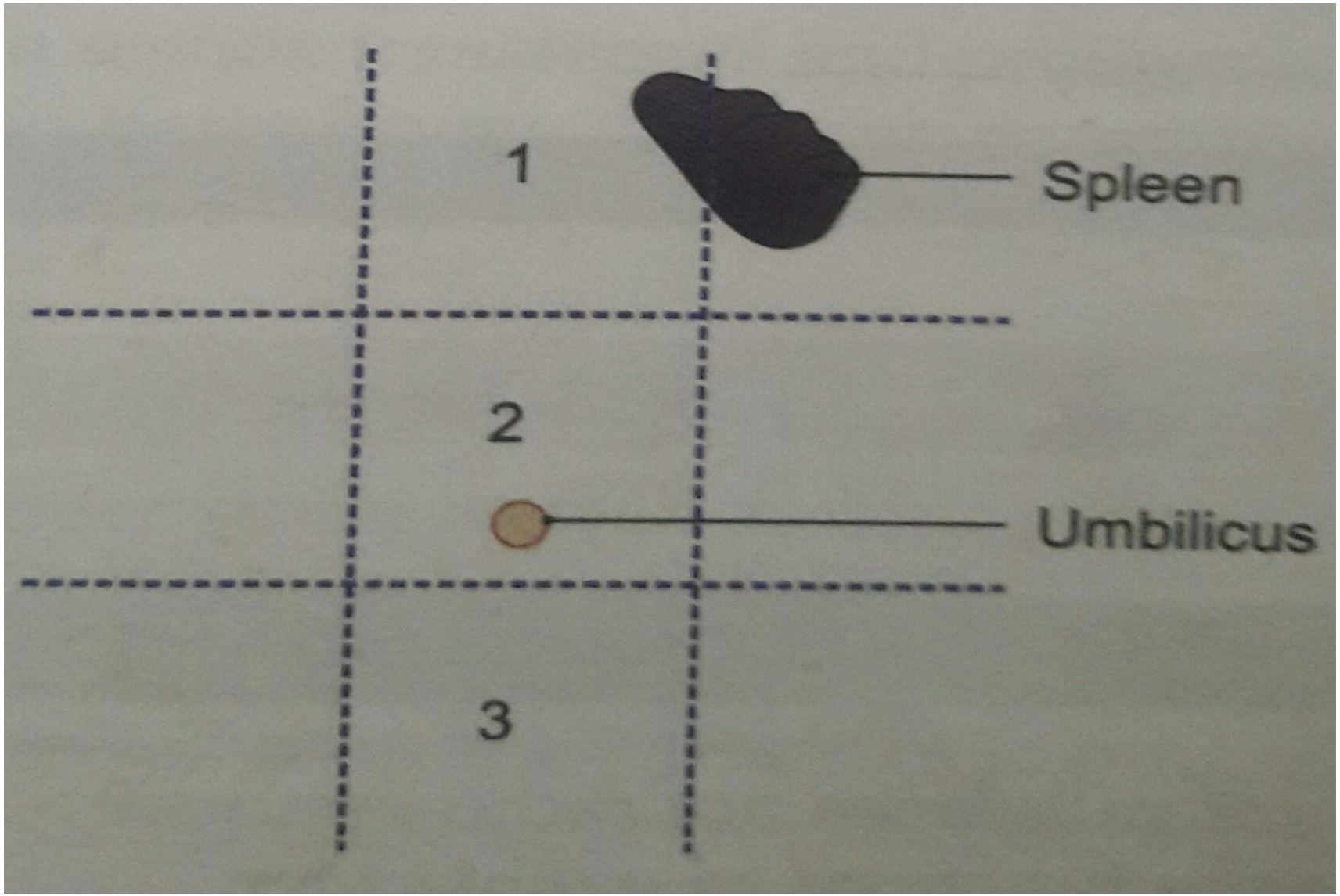
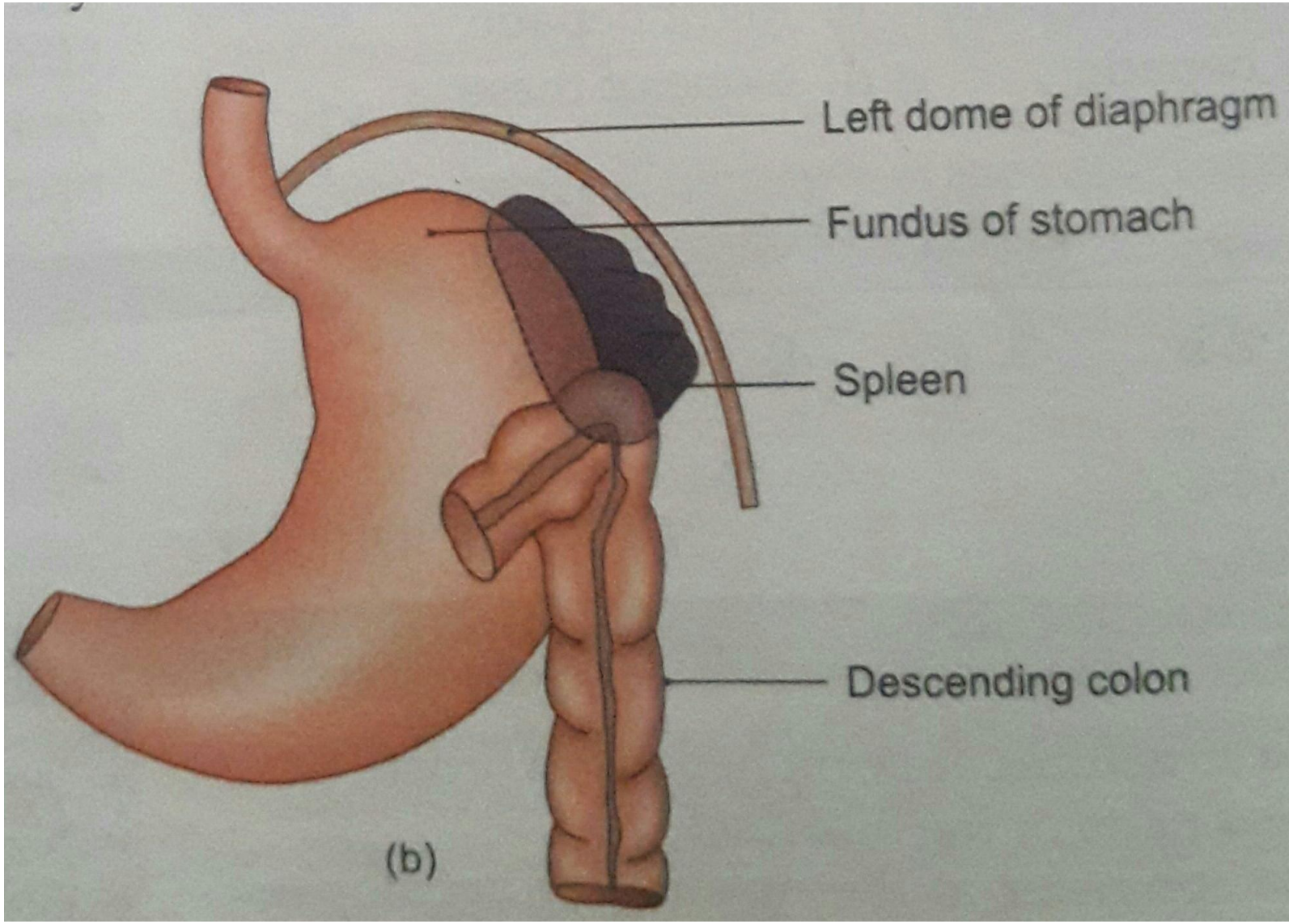
LOCATION

- The spleen is a wedge – shaped organ lying mainly in the left hypochondrium , and partly in the epigastrium.
- It is wedge in between the fundus of the stomach and diaphragm.
- The spleen is tetrahedral in shape.


1
Spleen
2
Umbilicus
3

DIMENTIONS

- The spleen is soft, highly vascular and dark purple in colour.
- The size and weight of the spleen are markedly variable.
- On an average, the spleen is 1 inch or 2.5 cm thick, 3 inches or 7.5 cm broad, 5 inches or 12.5 cm long, 7 ounces in weight, and is related to 9^{th} to 11^{th} ribs.
- The odd numbers are 1,5,7,9,11.
- normally, the spleen is not parpable.


Left dome of diaphragm
Fundus of stomach
Spleen
Descending colon
(b)

POSITION (AXIS OF SPLEEN)

- The spleen is obliquely along the long axis of the 10th rib.
- Thus , it is directed downwards, forwards and laterally, making an angle of about 45 Degree with the horizontal plane.

EXTERNAL FEATURES

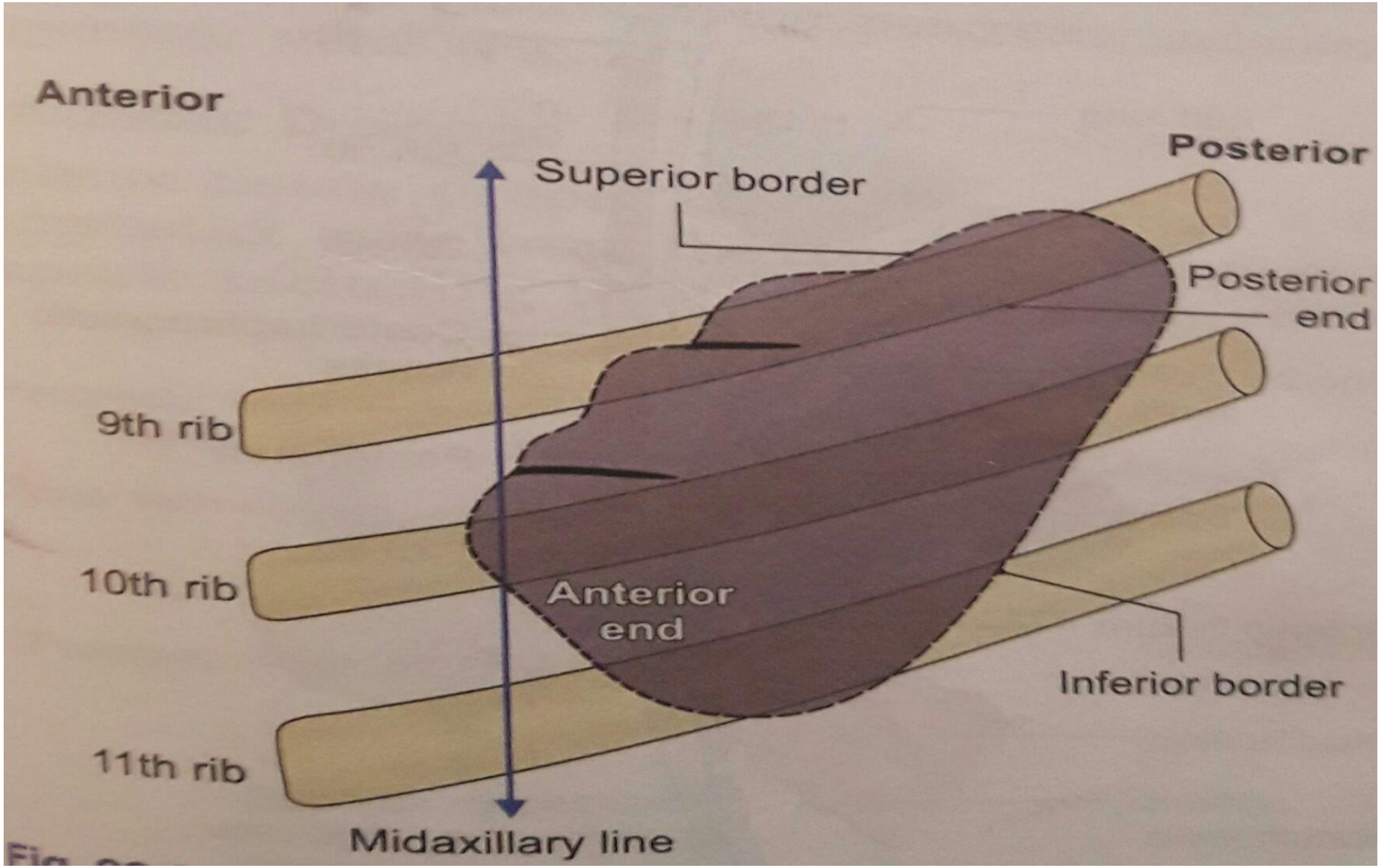
- The spleen has two ends, three borders, two surfaces, two angles and hilum.
- **Ends :**

1. Anterior or lateral ends :

- Expanded and is more like a border.
- It is directed downwards and forwards, and reaches the midaxillary line.

2. Posterior or medial end :

- Rounded.
- It is directed upwords, backwards and medially , and rests on the upper pole of the left kidney.


Anterior
Posterior
Superior border
Posterior end
9th rib
10th rib
Anterior end
Inferior border
11th rib
Midaxillary line

- **borders :**

1. superior border :

- Characteristically notched near the anterior end.

2. Inferior border :

- Rounded..

3. Intermediate border :

- Also rounded and is directed to the right.

- **Surfaces :**

1. Diaphragmatic Surface : convex and smooth.
2. Visceral surface : Convex and irregular.

- **Angles :**

1. Anterobasal angle : it is the junction of superior border with lateral or anterior end.

- It is the most forward projecting part of spleen.
- When spleen is enlarged, this is felt first, so this is called ' clinical angle of spleen '.

2. Posterobasal angle : junction of inferior border with lateral or anterior end of spleen.

- **Hilum :**
  - Hilum lies between superior and intermediate borders.
  - It is pierced by branches and tributaries of splenic vessels.

RELATIONS

- **Peritoneal relations :**
- The spleen is surrounded by peritoneum , and is suspended by following ligaments.

1. **Gastrosplenic ligament :**

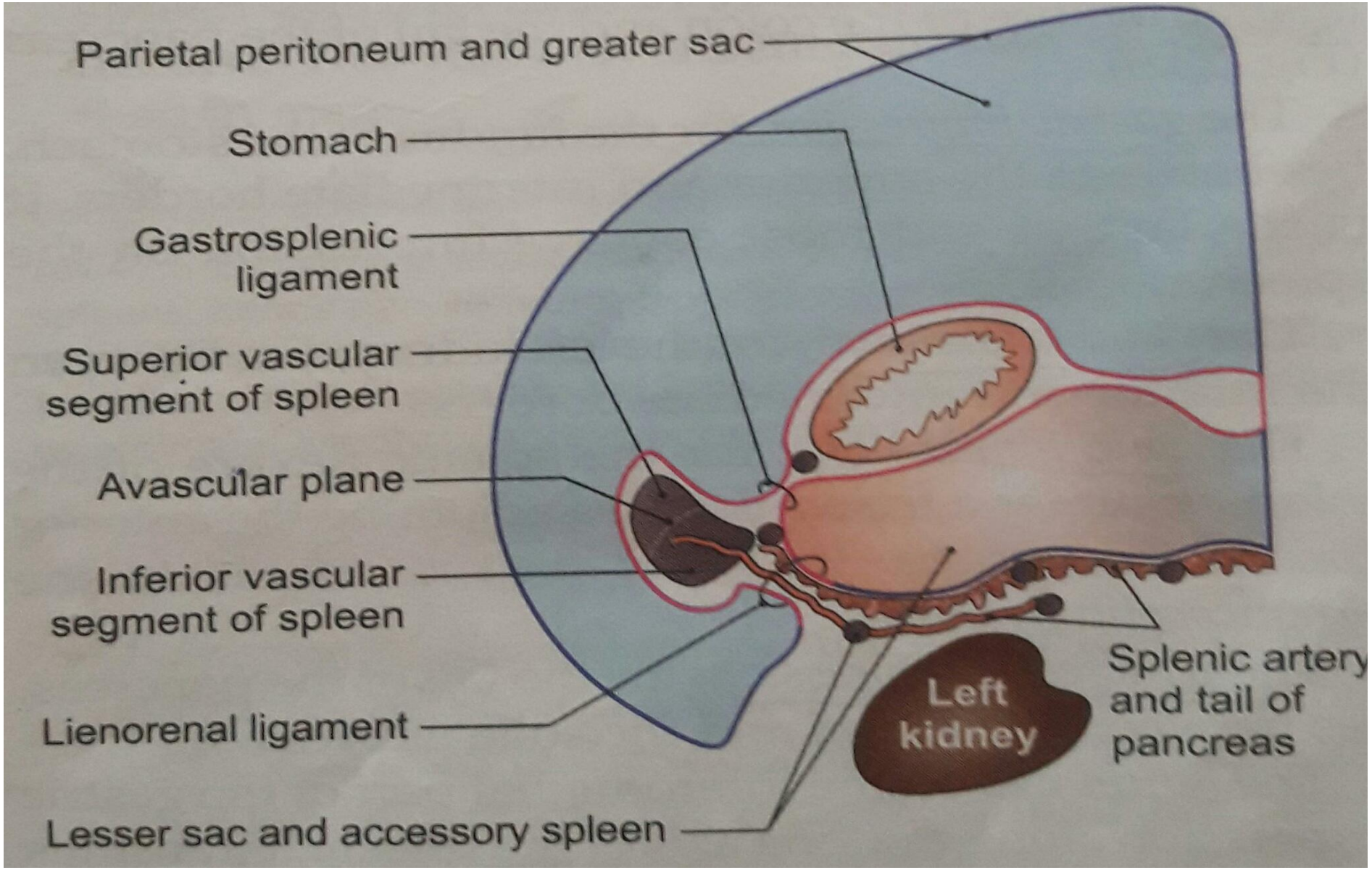
- Extends from the hilum of the spleen to the greater curvature Of the stomach.
- It contains the short gastric vessels and associated lymphatics and sympathetic nerves.

2. **Lienorenal ligament :**

- the hilum of the spleen to the anterior surface of the left kidney.
- It contains the tail of the pancreas , the splenic vessels, and associated pancreaticosplenicl ymph nodes , lymphatics and sympathetic nerves.

3. **Phrenicocolic ligament :**

- it is attached to the spleen, but supported its anterior end.
- It is horizontal fold of peritoneum extending from the splenic flexure of colon to the diaphragm, opposite the 11 th rib in the midaxilarry line.
- It limits the upper end of thr left paracolic gutter.
- It is also called sustentaculum lienis.

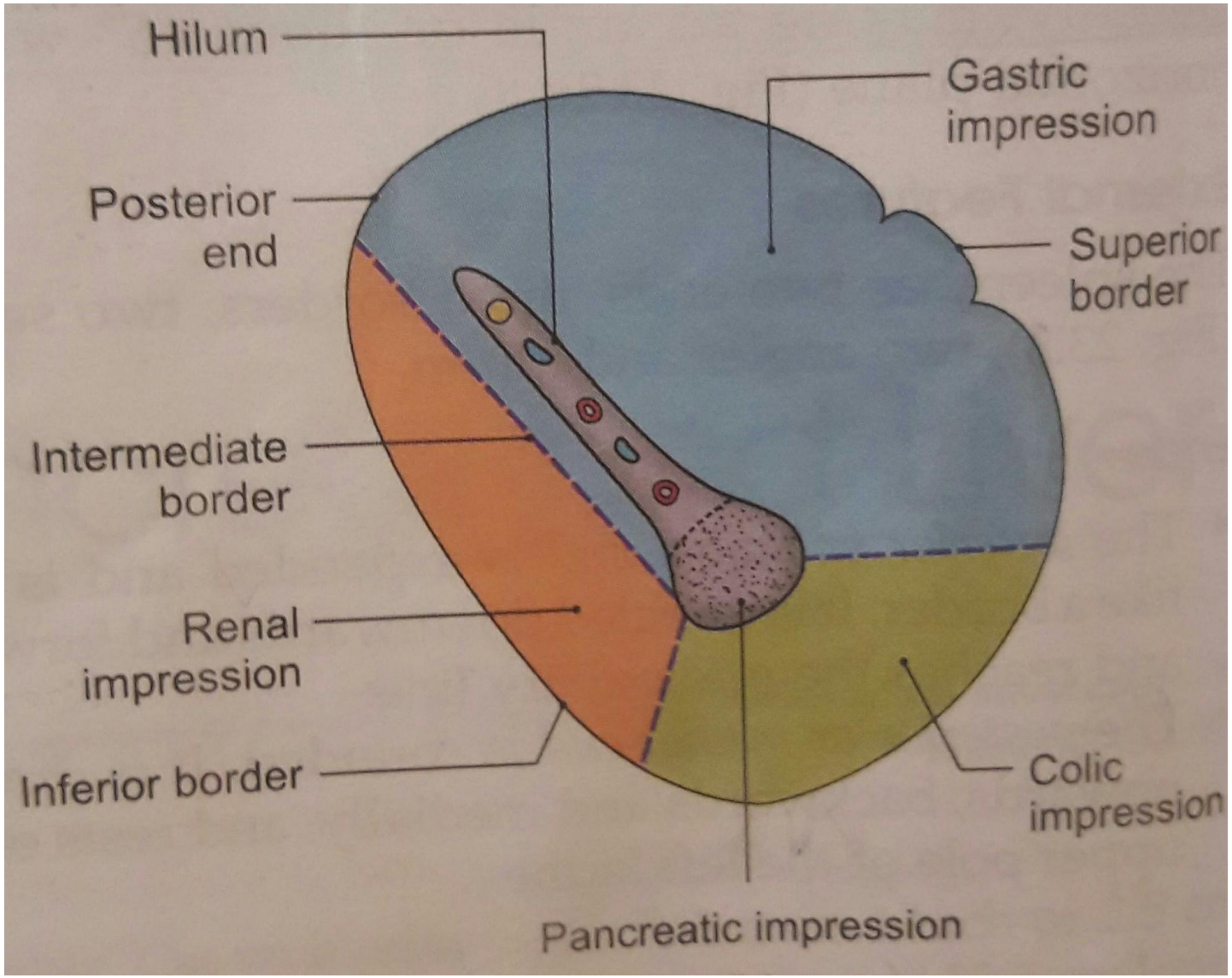

Parietal peritoneum and greater sac
Stomach
Gastrosplenic ligament
Superior vascular segment of spleen
Avascular plane
Inferior vascular segment of spleen
Lienorenal ligament
Lesser sac and accessory spleen
Left kidney
Splenic artery and tail of pancreas

- **Visceral relations :**

- **Visceral surface :**

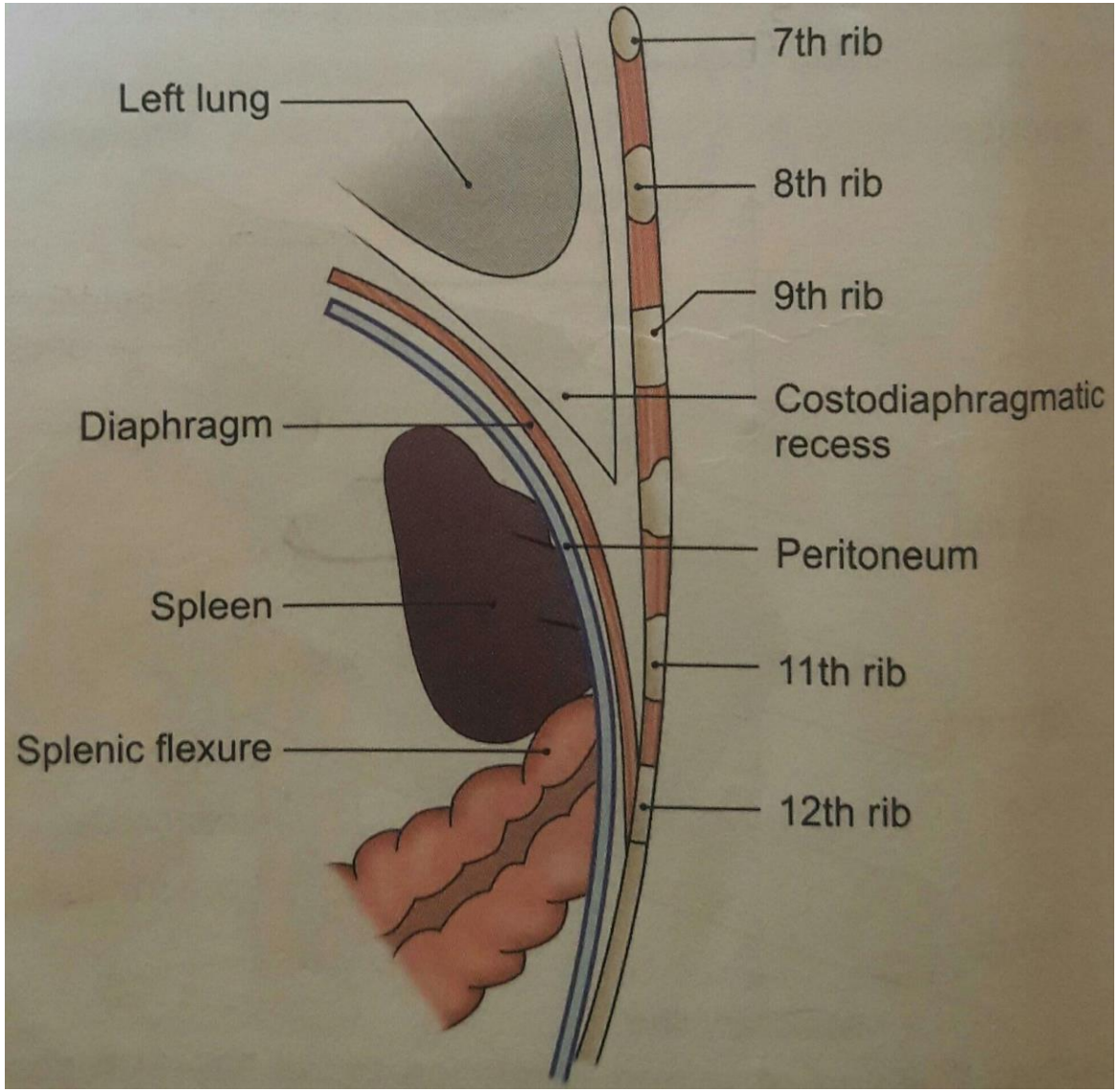
- The visceral surface is related to the fundus of the stomach, the anterior surface of the left kidney , to the splenic flexure of the colon and the tail of the pancreas.

1. Gastric impression.
2. Renal impression.
3. Collic impression.
4. Pancreatic impression.
5. Hilum.


Hilum
Gastric impression
Posterior end
Superior border
Intermediate border
Renal impression
Inferior border
Colic impression
Pancreatic impression

- **Diaphragmatic surfaces :**

- The diaphragmatic surface is related to the diaphragmatic which separates the spleen from the costodiaphragmatics recess of pleura , lung and 9^{th} , 10^{th} and 11^{th} ribs of the left side.


Left lung
7th rib
8th rib
9th rib
Costodiaphragmatic recess
Diaphragm
Peritoneum
Spleen
11th rib
Splenic flexure
12th rib

ARTERIAL SUPPLY

- The spleen is supplied by the splenic artery which is the largest branch of the coeliac trunk.
- The artery is tortuous in its course to allow for movements of the spleen.
- It passes through the linorenal ligament to reach the hilum of the spleen where it divided into five or more branches.
- These branches enter the spleen to supply it.
- Still others belivein a compromise theory, where the circulation is open in destended spleen and closed in contracted spleen.
- On the basis of its blood supply, the spleen is said to have superior and inferior vascular segments.
- Apart from its terminal branches, the splenic artery gives off :

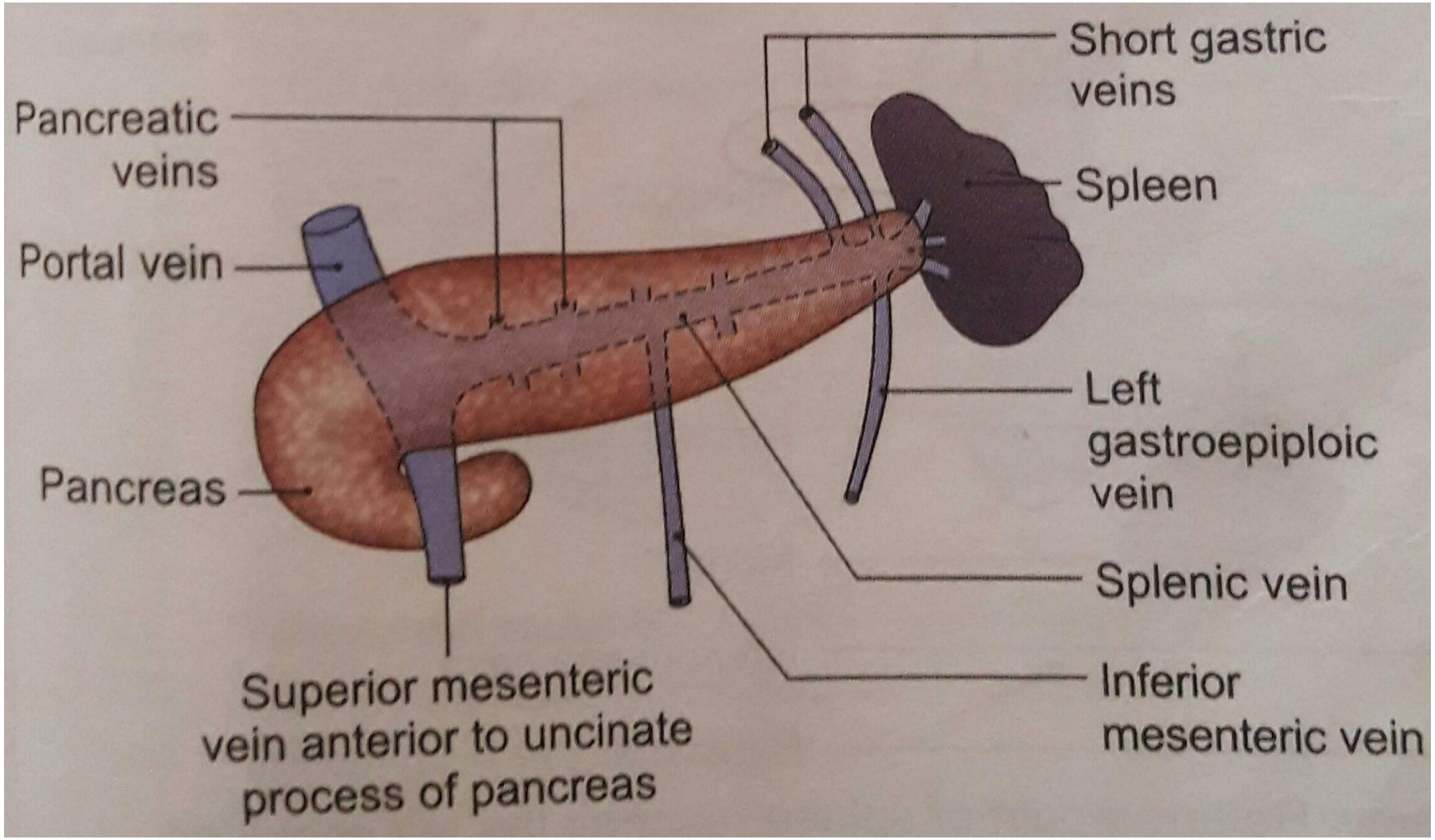
(a) Numberous branches to the pancreas,

(b) 5 to 7 short gastric branches ,

(c) The left gastropiploric artery.

VENOUS DRAINAGE

- The splenic veinisformed at the hilum of the spleen.
- It runs a straight course behind the pancreas.
- It joins the superior mesenteric vein behind the neck of the pancreas to form the portal vein.
- Its tributaries are the short gastric, left gastroepiploic , pancreatic and inferior mesenteric veins.


Short gastric veins
Pancreatic veins
Spleen
Portal vein
Left gastroepiploic vein
Pancreas
Splenic vein
Inferior mesenteric vein
Superior mesenteric vein anterior to uncinate process of pancreas

LYMPHATIC DRAINAGE

- Splenic tissue proper has no lymphatics.
- A few lymphatics arise from the connective tissue of the capsule including trabeculae and drain in to the pancreaticosplenic lymph nodes situated along the splenic artery.

NERVE SUPPLY

- Sympathetic fibers are derived from the coeliac plexus.
- They are vasomotor in nature.
- They also supply some smooth muscle present in the capsule.

FUNCTION OF THE SPLEEN

1. **PHAGOCYTOSIS :**

- The spleen is an important component of the reticuloendothelial system.
- The splenic phagocytes include :

(a) the reticular cells and free macrophaguses of the red pulp.

(b) Modified reticular celld of the ellipsoids.

(c) Free macrophages and endothelial cells of the venous sinusoids.

(d) Surfaces reticular cells of the lymphatic follicle.

(e) The phagocytes present in the organ remove cell debris and old and effete RBSs, other blood cells and microorganisms, and thus fiter the blood.

2. HAEMOPOIESIS :

- The spleen is an important haemopoietic organ during foetal life.

3. IMMUNE RESPONSES :

- Under antigenic stimulation , there occures increased lymphopoieses for cellular responses and increased formation of plasma celks for the humoral responses.

4.STORAGE OF RBCs :

- Red blood celks can be stored in the spleen and released into the circulation when needed.
- This function is better marked in animals than in man.

CLINICAL ANATOMY

- PALPATION OF SPLEEN :
  - A normal spleen is not palpable .
  - An enlarged spleen can be felt under the left costal margin during inspiration.
  - Palpation is assisted by turning the patient to his right side.
  - Note that the spleen becomes palpable only after it has enlarged to about twice its normal size.
- REFFERRED PAIN :
  - Pain of splenic tissue is poorly localiesed.
  - It is also reffered to the epigastrium.
  - Stretch of the splenic capsule produces localised pain in the posterior part of left upper quadrant(hypochondrium).
- Banti's disease is a chronic congestive enlargement of spkeen resulting in premature destruction of RBC.