FUNCTIONS OF THE SPLEEN

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Although the spleen was previously thought to be dispensable, it is now recognised that an incidental splenectomy during the course of another operative procedure increases the risk of complications and death. The surgeon should therefore normally endeavour to preserve the spleen to maintain the following functions. /uni25CF Immune function . The spleen contains 70.5% and 10–15% of the body’s total T and B lymphocyte popula tion, respectively . It processes foreign antigens and is the major site of specifi c immunoglobulin (Ig) M production. The non-specific opsonins, properdin and tuftsin, are synthesised. These antibodies are of B- and T-cell origin and bind to the specific rece ptors on the surface of macrophages and leukocytes, stimulating their phagocytic, bactericidal and tumoricidal activity . Loss of this function necessitates vaccination against capsulated microorganisms such as pneumococci in splenectomised patients. /uni25CF Filter function . Macrophages in the reticulum capture cellular and non-cellular material from the blood and plas ma. This will include the removal of e ff ete platelets and red blood cells. This process takes place in the sinuses and the splenic cords by the action of the endothelial macro phages. Iron is removed from the deg raded haemoglobin during red cell breakdown and is returned to plasma. Re moved non-cellular material may include bacteria and, particular, pneumococci. This occurs in the red pulp of the spleen and needs red cells with the capability to change shape and tra verse through the sinusoids. As the deforma bility is reduced in spherocytosis, the cells get removed in the spleen. Splenectomy is recommended in such patients to maintain the haemoglobin concentration. William Henry Howell , 1860–1945, Professor of Physiology , Johns Hopkins University , Baltimore, MD, USA. Justin Marie Jules Jolly , 1870–1953, Professor of Histopathology , Collège de France, Paris, France. Robert Heinz , 1865–1962, Professor of Pharmacology and Toxicology , Erlangen, Germany . /uni25CF Pitting . Distorted red cells in sickle cell disease result in slowing of circulation with multiple splenic infarcts, leading to loss of splenic function – autosplenectomy . This leads to the appearance of circulating red cells with Howell–Jolly and Heinz bodies, which represent nuclear remnants and precipitated haemoglobin or globin subunits, respectively , and appear as target cells on a smear. These particulate in - clusions within the red cells are removed, and the repaired red cells are returned to the circulation in the process of pitting. - /uni25CF Reservoir function . This function in humans is less marked than in other species, but the spleen does contain approximately 8% of the red cell mass. An enlarged spleen may contain a much larger proportion of the blood vol - ume. Massive splenic enlargement will be associated with a larger proportion of blood volume in the spleen, leading to pancytopenia, which can be corrected by splenectomy . /uni25CF 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 anti - genic challenge, resulting in the proliferation of T and B - cells and macrophages. This may also occur in myelopro - liferative disorders, thalassaemias and chronic haemolytic anaemias. - - Summary box 70.1 in Functions of the spleen /uni25CF - /uni25CF /uni25CF /uni25CF /uni25CF

Primary follicle Marginal zone White pulp Periarteriolar lymphoid sheath Germinal centre Vein Artery Immune Filter function Pitting Reservoir Cytopoiesis

Conditions that result in splenomegaly can be diagnosed on the basis of the history and examination and laboratory exam ination. In haemolytic anaemia, a full blood count, reticulocyte count and tests for haemolysis will determine the cause of the anaemia. Splenomegaly associated with portal hypertension caused by cirrhosis is diagnosed on history , physical signs liver dysfunction including ascites, abnormal tests of liver func tion, often anaemia, leukopenia and thrombocytopenia, as well as endoscopic evidence of oesophageal varices. Non-cirrhotic portal fibrosis, a condition common in tropical countries, is associated with massive splenomegaly and pancytopenia without stigmata of liver dysfunction. Sinistral or segmental portal hypertension ma y result from isolated occlusion of the splenic vein by thrombosis, pancreatic inflammation or tumour infiltration. As many conditions that cause splenomegaly are associated with lymphadenopathy , investigation should be directed at those disease processes known to be associated with both physical signs. Lymph node biopsy may be required.

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