EFFECT OF SPLENECTOMY ON BLOOD ELEMENTS IN PORTAL HYPERTENTION PATIENTS.

THESIS

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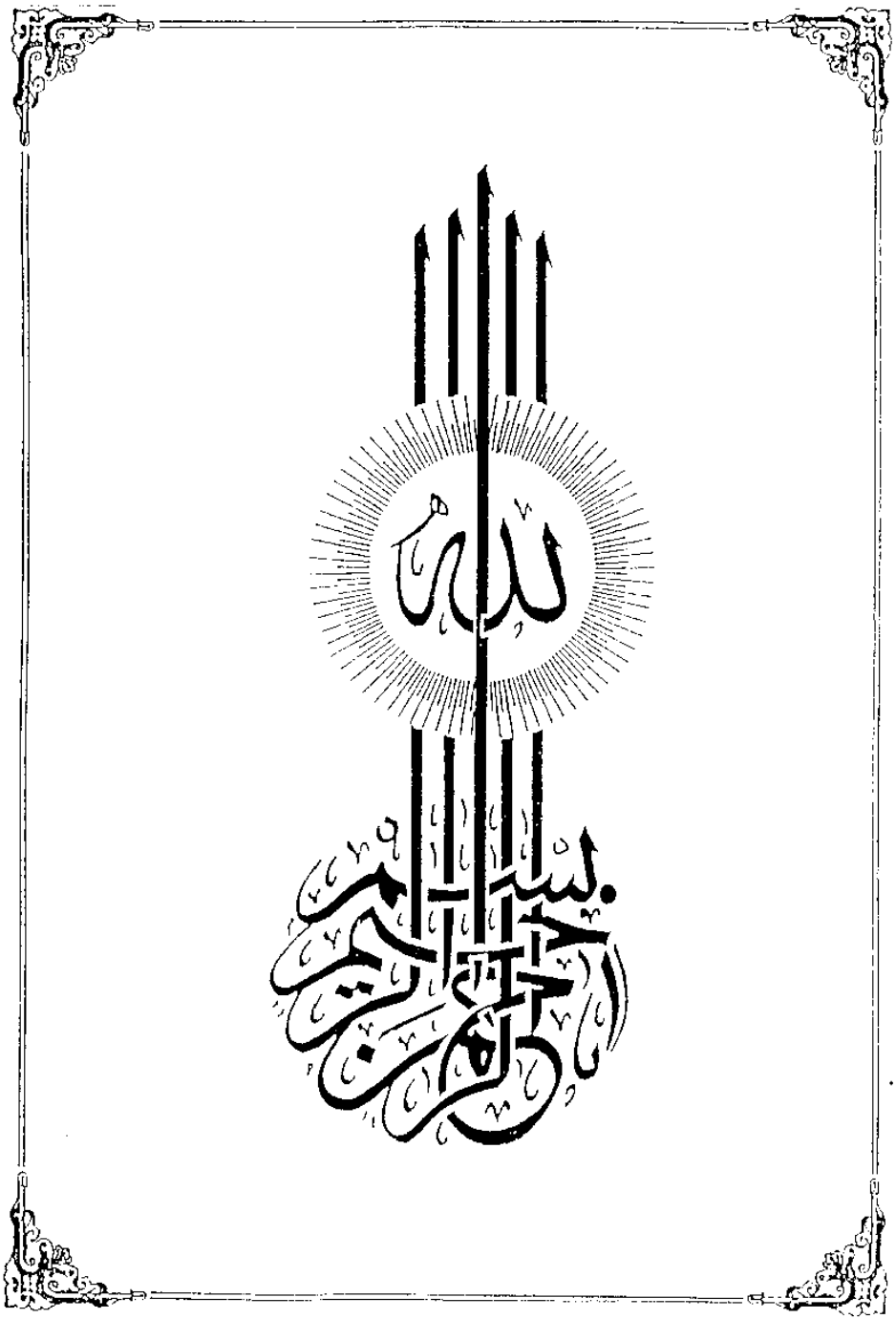

C O N T E N T S

INTRODUCTION

&

AIM OF THE WORK

I N T R O D U C T I O N

The spleen has a long distinguished history as an object of scientific scrutiny.

Over centuries two factors emerged about the spleen :

first, the spleen is not essential for life,

second, splenic enlargement is usually, but not always, accompanied by poor health.

The spleen is closely related to the hematopoietic system , which is evident since it becomes enlarg--ed in association with a variety of blood diseases some of which are ameliorated when the spleen is removed.

Furthermore , striking changes are found in blood following splenectomy , with a fluctuat--ing tendency towards an increase in the number of certain blood elements that seems to characterize the post-splenectomy blood picture.

A I M OF THE W O R K

The work aims at demonstrating the following hematologic changes after splenectomy :

1- Changes in the red blood cell count.

2- Changes in the reticulocytic count.

3- Changes in haemoglobin concentration.

4-Changes in the mean corpuscular haemoglobin concentration.

5- Changes in the platelet count.

6- Changes in the total and differen-tial leucocytic count.

7- Changes in the hematocrit(P.C.V.).

REVIEW OF LITERATURE

ANATOMY OF THE SPLEEN

The spleen develops in the mesoderm of the left leaf of the dorsal mesogastrium . It lies in the left hypochondrium between the left ninth and eleventh ribs , with its long axis in line with the left tenth rib.

The spleen measures 1 X 3 X 5 inches and weighs 7 oz . It possesses a diaph--ragmatic and a visceral surface , upper and lower poles , and anterior and posterior borders (Last I977).

The diaphragm separates the diaphragma--tic surface from the left lung and pleura, and the left ninth ,tenth and eleventh ribs, while the visceral surface , which is directed towards the abdominal cavity , presents renal , gastric,pancreatic and colic impressions.

The spleen is surrounded by peritoneum almost completely except when the peritoneum is reflected to form the followings ligaments:

1) Gastrosplenic ligament: between the spleen and the fundus and upper part of the body of the stomach. It contains the short gastric and gastroepiploic vessels.

2) Lienorenal ligament: between the spleen and the left kidney . It contains the splenic vessels on their way in or out of the splenic hilum.

3) Avascular ligaments : between the spleen and the under surface of the diaphragm & the left colic flexure .

The nerve supply to the spleen comes from the coeliac plexus along the splenic vessels.

The afferent lymphatics of the spleen drain to the pancreatico-splenic lymph nodes on the upper border of the pancreas. However,

the spleen has no efferent lymphatics , so there is no lymphatic spread of malignant cells to the spleen and splenic metastases are purely hematogenous.

The blood supply of the spleen is delivered by the splenic artery, the largest branch of the coeliac trunk . The splenic artery pa--sses to the left on the upper border of the pancreas with the splenic vein below and behind the pancreas , then they both cross anteriorly in the lienorenal ligament to end in the hilum of the spleen (Warwick & Peter 1973).

Where the splenic artery divides into two branches in 8 4 % of the cases and into three divisions in 16 % of the cases ,thus dividing the spleen into two or three vas--cular segments without any apparent anast--omosis in between (Gupta et al 1976).

STRUCTURE OF THE SPLEEN

The spleen is enclosed in a capsule formed mainly of fibrous tissue and some muscle fibres. The splenic capsule sends trabeculae into the splenic parenchyma along which arteries and veins penetrate from the hilum.

The parenchyma of the spleen is divided according to the type of tissue it contains into :-

1) The red pulp.
2) The white pulp.
3) The marginal zone in between the red and white pulps.

Each division has the following three components :

(a) Vessels.
(b) Reticular cells.
(c) Free cells in a reticular meshwork. (Crosby 1977).

(I) THE RED PULP

It consists of sinuses that anastomose irregularly with each other forming irreg--ular spaces that are filled by the pulp cords , and the matrix contains many free cellular elements.

The sinuses are composed of bundles of long spindle shaped " sinus endothelial cells " whose basement membrane is not continuous and so relatively free communica--tion is present between the sinus lumen and the nearby pulp cords (Hirasawa & Tokuhiro 1970). These communications , or better called " slits " are simple elongated spaces between the sinus endothelial cells through which normal erythrocytes squeeze with marked pliancy while passing from the pulp cords to the sinus lumen . On the other

hand slightly or moderately damaged cells fail to do so , either due to rigid cell wall and cytoplasm ; as in the old erythrocytes , or due to the presence of rigid non-pliant cytoplasmic inclusions such as malaria plasmodia , hence these abnormal cells are either delayed ,modified or destroyed while passing through the slits (Weis I974).

The cords are formed of bulky irregular reticular cells with broad membranous processes that,by connection to each other, form a rather complete channel , thus simulating blood vessels(Hirsawa & Tokuhiro I970).

The free cells which are present in the cords beside the reticular cells are :

1. Erythrocytes.
2. Granulocytes of the blood.
3. Lymphocytes.
4. Numerous macrophages.

(II) THE WHITE PULP

In histologic sections ,under the light microscope , it appears as small discs sur-
-rounded by the red pulp matrix . However, in three-dimensional studies , the white pulp is a cylindrical periarterial lymph-
-atic sheath surrounding the central artery and containing the germinal centres which lie eccentric in the lymphatic sheath. The germinal centres contain large and medium sized lymphocytes , together with many macrophages, and are surrounded by a shell of small lymphocytes that form the bulk of the white pulp.

The free cells of the white pulp are predominantly small lymphocytes , few granulocytes and very few red cells(Weis I974).