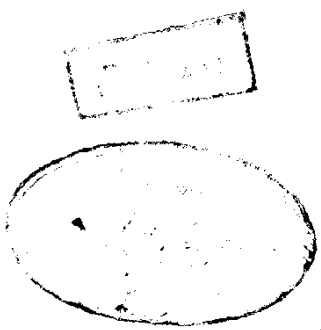
INJURIES OF THE SPLEEN

ESSAY

Submitted in Partial Fulfilment
For the Requirement of the
Master Degree
(General Surgery)



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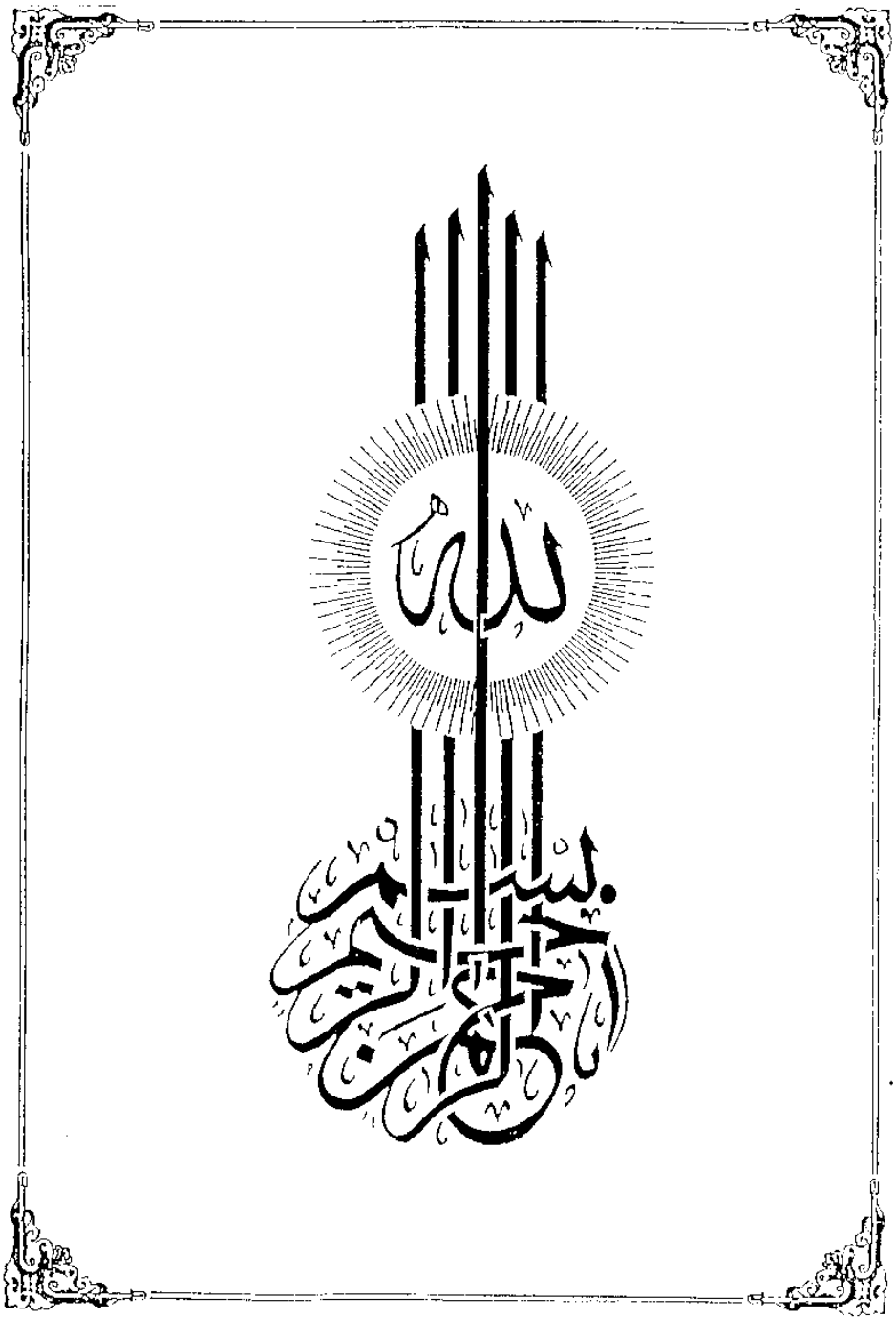
1985

ACKNOWLEDGEMENT

Firstly and foremost, I feel always indebted to God, the Kindful and Merciful.

I wish to express my utmost gratitude to Professor Dr. Abd Alla El Fiky, Professor of General Surgery, Ain Shams University, For his generous assistance. His constant supervision and encouragements to me have been of great help in preparing this work and his sincere guidance and advice have gifted this work its value.

Soliman Roshdy Soliman



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The spleen is a firm parenchymatous organ situated principally in the left hypochondriac region between the diaphargm and the fundus of the stomach. (Warwick and Williams, 1973).

It is uniquely interposed in the circulating blood in such a way as to clear approximately 4 % of the circulating blood volume per minute. This permitting defective cells or foreign material to be removed from the general circulation.

The spleen also contains 25 % of the body's lymphoid tissue and reticuloendothelial cells (Francke and Neu, 1981).

Thus it participates in the cellular aspect of antibody production and also considered the sole source of a gammaglobulin fraction called Tuftsin that is essential for maximal stimulation of phagocytic activity of blood neutrophils (Sherman, 1981).

Now; there is steady increase in the incidence of splenic injuries. This is mainly due to the increase in high velocity accidents leading to splenic rupture

after blunt trauma, wide spread use of firearms in the world together with rising incidence of upper abdominal surgery (Klaue et al., 1979).

Most studies of the splenic injuries have found that penetrating trauma and blunt trauma are about equal in the etiology of splenic rupture. (Naylor et al., 1974).

New techniques in diagnosis of splenic injures have been elaborated to minimize the incidence of exploratory laparotomy and new techniques in management of splenic injuries have been employed to preserve its function. It is to be noted that not all splenic injuries will require splenectomy, This may be necessary in less than one half of the cases and the remainder can be managed successfully by non-operative management , splenorrhaphy, partial splenectomy or arterial ligation (Slim et al., 1979).

These attempts to preserve the injured spleen, as if this is technically possible, are essential in all age groups especially children in order to avoid the development of overwhelming post splenectomy sepsis

which is found to be about 0 to 0.7 % after splenic trauma. (Standage and Goss, 1982).

This serious type of infection carries mortality rate more than 50 % and the younger the person, the higher the mortality rate (Krivit et al., 1979).

This review, will discuss the different methods of diagnosis of splenic injury with a comparison of their accuracy and also different methods of management with their advantages and drawbacks.

EMBRYOLOGY OF THE SPLEEN

Embryology of the Spleen

In the sixth week of gestation, the spleen appears as a localized condensation of mesodermal cells in the dorsal mesogastrium. This thickening soon projects from the left surface of the dorsal mesogastrium into the general peritoneal cavity (Fitzgerald, 1978).

In the earliest stages, the spleen consists of a number of mesenchymal masses that later fuse, so by the third month, it has acquired its characteristic shape. The notches along its anterior border are permanent and indicate that the mesenchymal masses never completely fuse. (Snell, 1972).

The part of the dorsal mesogastrium that extends between the hilum of the spleen and the greater curvature of the stomach called the gastro-splenic ligament and the part that extends between the spleen and the left kidney on the posterior abdominal wall is called lienorenal ligament.

An artery, a branch of the coeliac artery, to the greater curvature of the stomach, passes in the dorsal mesogastrium. It also supplies the developing spleen and becomes the splenic artery of adult anatomy (Hamilton and Mossman, 1972).

The mesenchymal cells in the developing spleen differentiate and form the capsule, the trabeculae and the reticular framwork. Lymphoblasts appear early and start to produce lymphocytes throughout life.

During the fourth and fifth months of intrauterine life, erythroblasts, myeloblasts and megakerocytes are present in the spleen, so that erythrocytes, granular leucocytes and platelets are produced in the spleen for a period of time. By the eighth month, the formation of erythrocytes and granular leucocytes ceases (Snell, 1972).

During these histogenic changes, the branches of the splenic artery come to open into spaces called sinusoids which may be devoid of an endothelial lining. Some of the lining cells of the sinusoids become specialized to form part of the reticuloendothelial system. (Hamilton and Mossman, 1972).

Congenital Abnormalities:

1) Absence: Very rare and mostly associated with a congenital cardiac abnormality and accessory lobes of the lung.

2) Wandering spleen: with torsion of its pedicle in w chich the normal attachments allow the spleen to move.

3) Accessory spleens (Splenunculi): It occurs in 18-30% of population, arising due to failure of complete coalescence of normal primordial spleen buds or the formation of spleen buds in unusually distant locations. Another explanation, is that some splenic tissue becomes detached from the main mass during development. The most common sites for accessory spleens are in the hilus, in the suspensory ligaments of the spleen particularly gastrosplenic and splenocolic ligaments, the mesentry, greater omentum and on the left testis or ovary. (Philpott and Ballinger 1981).

ANATOMY OF THE SPLEEN

Anatomy of the Spleen

The spleen is situated in the left hypochondriac region of the abdomen, but its posterior edge extends into the epigastric region, lying between the fundus of stomach and the diaphragm. Its shape varies according to the size of the colic impression, from a slightly curved wedge (if the colic impression is small) to tetrahedron (if the colic impression is large).

The adult normal spleen varies from 10 - 13 cm in length, 5-10 cm in width and 3-5 cm in thickness. It varies from 160 - 300 grams in weight, averaging about 200 grams and its colour varies from purplish grey to deep red. (Williams et al., 1963).

Its long axis lies in the line of the tenth rib, its posterior extremity being about 4 cm from the mid dorsal line opposite the spine of the tenth thoracic vertebra and its anterior extremity reaching as far as the mid axillary line (Warwick and William, 1973).

Relations:

The spleen has a larger convex surface (diaphragmatic surface) which lies in contact with left diaphragm, posteriorly, superiorly and laterally separating

of great surgical importance these are:

1. Gastro-splenic ligament: is a double layer of peritoneum that connects the left part of the greater curvature of the stomach to the hilus of the spleen. It is continuous with the greater omentum below. It contains short gastric and left gastro-epiploic vessels.

2. Lienorenal or splenorenal ligament: is also a double layer of peritoneum extending between the hilus of the spleen and the anterior aspect of the left kidney. The splenic artery and vein lies within this ligament, as well as the tail of the pancreas.

3. Phrenico colic ligament: is a fold of peritoneum attaching the splenic flexure of the colon to the diaphragm at the level of the tenth and eleventh ribs. The inferior part of the spleen lies upon and is connected to the phrenicocolic ligament.(Grobler, 1975).

There may be several other attachments of the spleen which have surgical importance but are not constant e.g. splenophrenic and splenocolic ligaments. These ligaments are avascular and can be easily transected to bring the spleen and hilum medially and anteriorly into the level of the wound. (Schwartz, 1984).