SHUNT OPERATIONS FOR TREATMENT OF PORTAL HYPERTENSION

An Essay submitted for partial fulfilment of the master degree (MSc) in General Surgery

By

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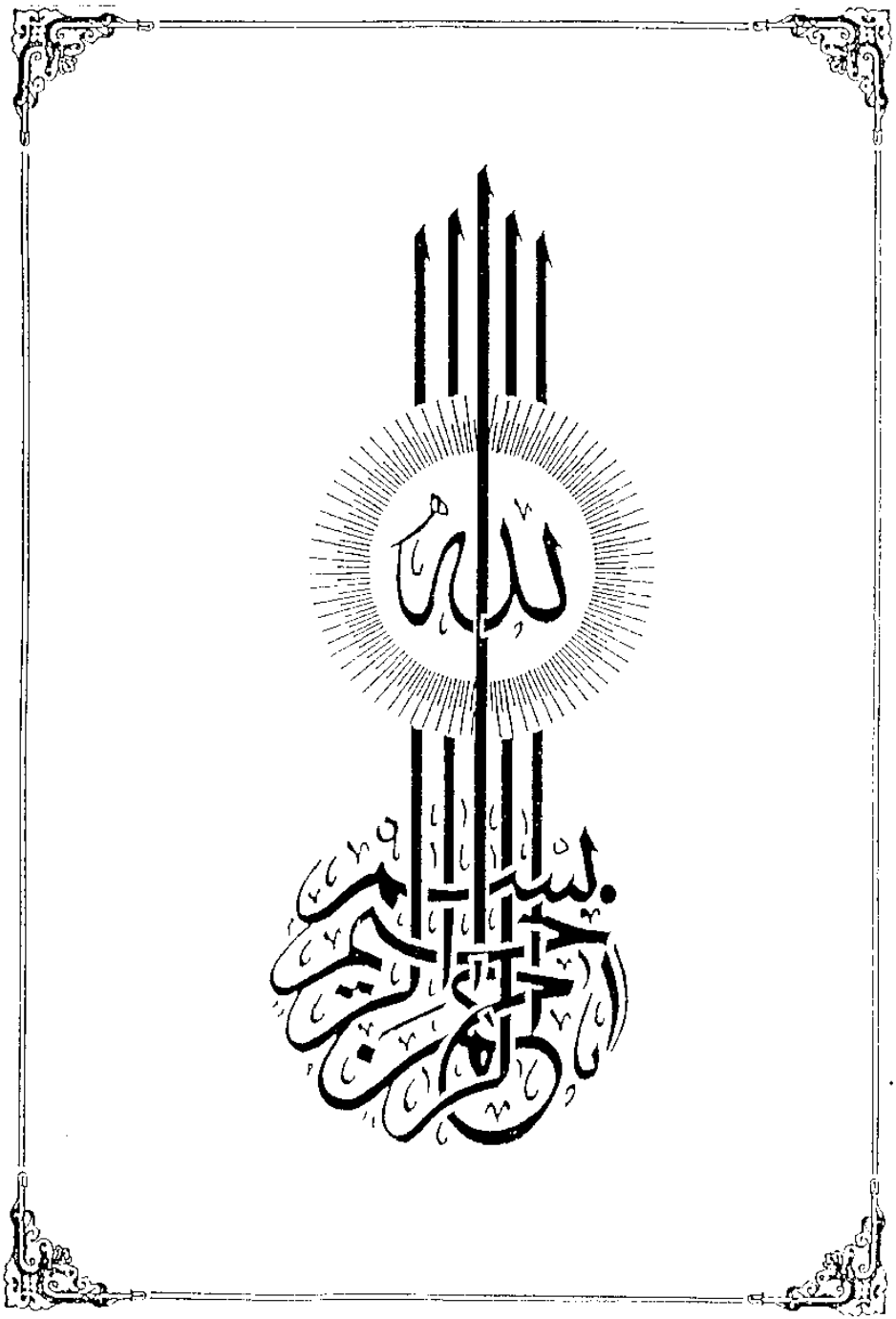

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INTRODUCTION

Portal hypertension and its sequelae represents a very serious illness allover the world. It carries a very high morbidity and mortality.

Bilharzial infestation is considered the main cause of such a condition in Egypt. Different lines of treatment were advocated including conservative medical treatment, injection sclerotherapy and surgical treatment.

Surgery for portal hypertension falls into two main categories;

- Portal decompresion procedures.
- Non shunting procedures.

Such an essay will evaluate the different shunt operations used for treatment of portal hypertension with special reference to the advantages and disadvantages of each operation.

ANATOMY OF THE PORTAL SYSTEM OF VEINS

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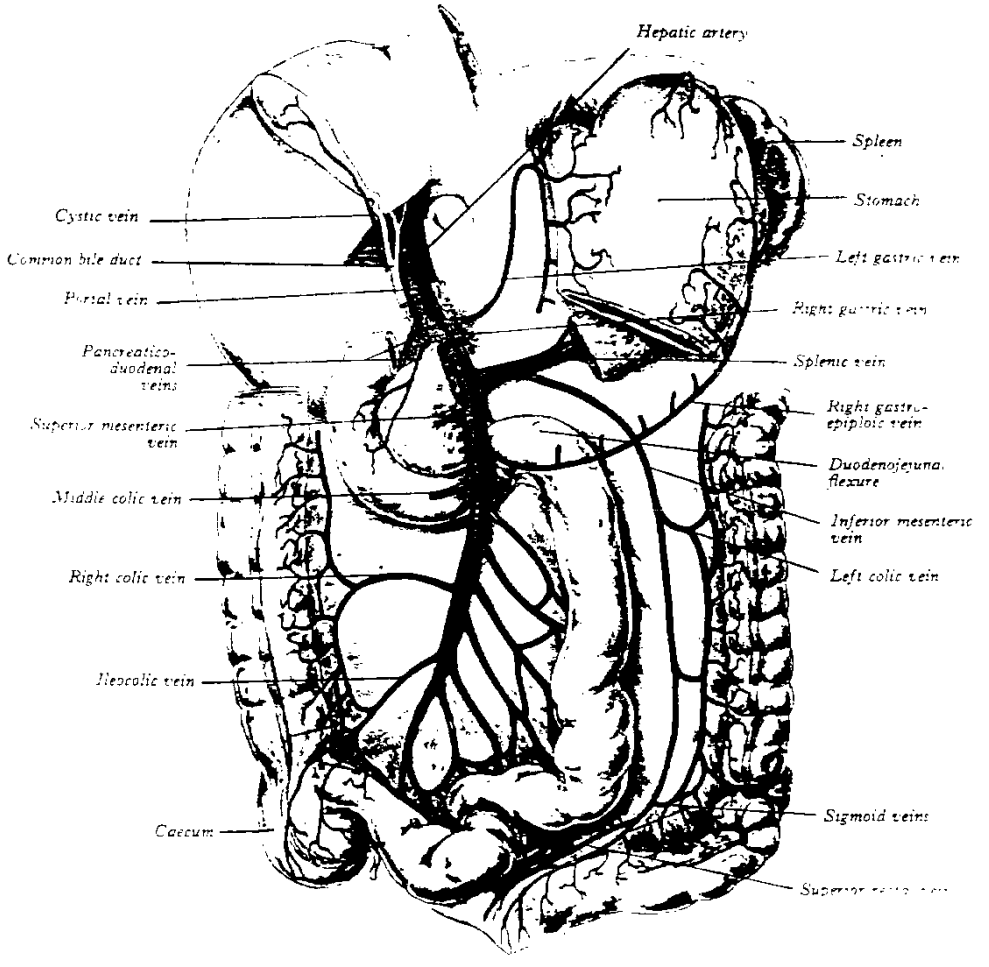
The portal system includes all veins which carry blood from the abdominal part of the digestive tube, with exception of the lower part of the anal canal, and also from the spleen, pancrease and gall bladder to the liver. From these viscera blood is convayed into the liver via the portal vein. In the liver this vein ramifies like an artery and ends in cappillary like vessels termed sinusoids. From these sinusoids blood is convayed to the inferior vena cava by the hepatic veins (Gray's anatomy, 1979).

The blood of the portal system passes through two sets of exchange vessels, the first is the cappillaries of the digestive tube, spleen, pancrease and gallbladder, and the second is the sinusoids of the liver (Rynold, 1983).

In the adults the portal vein and its tributaries have no valves. In the foetus and for a short time after birth valves can be demonstrated in its trebutaries (Gray's Anatomy, 1979)

Portal vein

The portal vein is formed by the union of the superior mesentric vein and the splenic vein just posterior



The Portal System of veins

to the neck of the pancrease at the level of the second lumbar vertebra. It is considered an upward continuation of the superior mesentric vein (Last, 1984).

The vein inclines slightly to the right as it passes upwards behined the superior part of the duodenum, the bile duct and the gastro-duodenal artery and in front of the inferior vena cava. It then ascends in the right border of the lesser omentum in front of the epiploic foramen to reach the right extremity of the porta hepatis where it divides into right and left stems. These two divisions accompany the corresponding branches of the hepatic artery into the substance of the liver (Gray's Anatomy, 1979).

In the lesser omentum, the portal vein is placed behined the bile duct and hepatic artery, the bile duct being to the right and hepatic artery to the left. The right branch of the portal vein enters the right lobe of the liver, but before doing so, it receives the cystic vein. The left branch gives branches to the quadrate and quadate lobes, and then enters the left lobe of the liver. As it enters the liver it is joined in front by the paraumbilical veins and by a fibrous cord named the ligamentum teres which represents the obliterated

left umbilical vein. It is connected to the inferior vena cava by a second fibrous cord termed the ligamentum venosum, which represents the obliterated ductus venosus and ascends in a fissure on the posterior aspect of the liver. (Gray's Anatomy, 1979).

The average anatomical length of the portal vein is 7.3 cm and its diameter ranges between 0.8-1.4 cm. it is found that the tributaries of the portal vein trunk in 92 speciments are:

The pyloric veins 75 percentage.
The accessory pancreatic vein 31.5 percentage.
The coronary vein 24.4 percentage.
The superior pancreatico-duodenal vein 100 percentage.
The right gastro-epiploic vein 13 percentage.

(Gillifilland et al, 1950).

The tributaries of the portal vein are summarised as follows:

Splenic vein
Superior mesentric vein
Left gastric vein
Right gastric vein
Para umbilical veins
Cystic veins

(Gray's Anatomy, 1979).

Splenic vein

This vein is formed by five or six tributaries which emerge from the hilum of the spleen. It passes to the right on the posterior surface of the pancreas, at first in the lienorenal ligament and then anterior to the left kidney, left psoas, left crus of the diaphragm and then anterior to the aorta between the origins of the superior mesentric artery and coeliac trunk. It ends by joining the superior mesentric vein anterior to the inferior vena cava. Its average anatomical length is 6 cm. and its average distal diameter is 0.43 cm. to 1.27 cm. (Cunnigham, 1983).

The tributaries of the splenic vein include: Short gastric veins, left gastro-epiploic vein, pancreatic veins and the inferior mesentric vein.

(Gray's Anatomy, 1979).

Short gastric veins

These are four to five veins which drain the fundus and left part of the greater curvature of the stomach, and pass between the two layers of the gastro splenic ligament. They enter either the superior portion or in some cases in the lower portion of the spleen directly into its substance, or they join its hilar trunks

(Gray's Anatomy, 1979).

Left gastro-epiploic vein

It receives branches from both surfaces of the stomach and from the greater omentum. It runs from right to left along the greater curvature of the stomach between the anterior two layers of the greater omentum and ends in the splenic vein (Last, 1984).

Pancreatic veins

They are small vessles, from 3-13 in number. They drain the body and the tail of the pancreas. As their course is extremely short, great care must be taken during mobilization of the spleen to avoid injury to the pancreas or splenic vein (Last, 1984).

1. **The inferior mesentric vein**

It receives blood from the rectum, the sigmoid and descending colon. It begins in the rectum as a sperior rectal vein which has its origin in the rectal plexus and through such plexus it communicates with the middle and inferior rectal veins (Last, 1984).

The superior rectal vein leaves the lesser pelvis crosses the left common iliac vessels on the medial side of the left ureter together with the superior rectal artery, and is continued upwards as the inferior mesentric

vein. This lies to the left of its artery and ascends behind the peritoneum and infront of the left psoas major muscle. It may cross the testicular (or ovarian) vessles or lie medial to them, it then passes above or behind the duodenojejunal flexure and opens into the splenic vein behind the body of the pancreas, sometimes it ends at the union of the splenic and superior mesentric veins (Gray's Anatomy, 1979).

The inferior mesentric vein receives the sigmoid branches from the sigmoid colon and the left colic vein from the descending colon and left colic flexure.

(Last, 1984).

2. <u>Superior mesentric vein</u>

It collects blood from the small intestine, caecum and ascending and transverse portions of the colon. It begins in the right iliac fossa by the union of the tributaries from the terminal ileum, caecum and vermiform appendix (Gray's Anatomy, 1979).

It ascends between the two layers of the mesentry on the right side of the superior mesentric artery. It crosses the third part of the duodenum, runs between the uncinate process and the neck of the pancreas and

passes straight up as the portal vein behind the first part of the duodenum. It is named portal vein above the level of the entry of the splenic vein, and superior mesentric vein below it. (Last, 1984).

The superior mesenteric vein receives many tributaries, it receives the jejunal, ileal, ileocolic, right colic and middle colic veins. It is also joined by the right gastro-epiploic and pancreatico-duodenal veins (Gray, 1979)

a. <u>The right gastro-epiploic vein</u>

It receives branches from the greater omentum and from the lower part of the stomach. It then runs from left to right along the greater curvature of the stomach between the anterior two layers of greater omentum and joins the superior mesentric vein below the neck of the pancreas (Cunningham, 1983).

b. <u>The pancreatico-duodenal veins</u>

They accompany their corresponding arteries, the lower frequently joins the right gastro-epiploic vein, the upper one usually passes upwards and to the left behined the bile duct and terminates in the portal vein (Cunningham, 1983).

c. **Ileocolic vein**

It drains the ascending colon, caecum, terminal part of the ileum and terminates in 80 percent of cases in the main trunk of the superior mesentric vein above the inferior border of the duodenum (Gray's Anatomy, 1979).

3. **Left gastric vein**

It derives tributaries from both surfaces of the stomach, it runs upwards along the lesser curvature of the stomach between the two layers of the lesser omentum to oesophageal veins. It then turns backwards and passes downwards and to the right behind the lesser sac of peritoneum and ends in the portal vein at the upper border of the superior part of the duodenum.

(Grays anatomy, 1979).

Its length is 5.5 cm to 6 cm and its width is 0.13-0.38 cm. It transmits the high portal pressure to oesophageal veins at the cardio-oesophageal junction.

(Khairy, 1960).

4. **Right gastric vein**

It is of small size, it runs from left to right along the pyloric portion of the lesser curvature of the stomach, between the two layers of the lesser omentum