VARICOCELE

ESSAY

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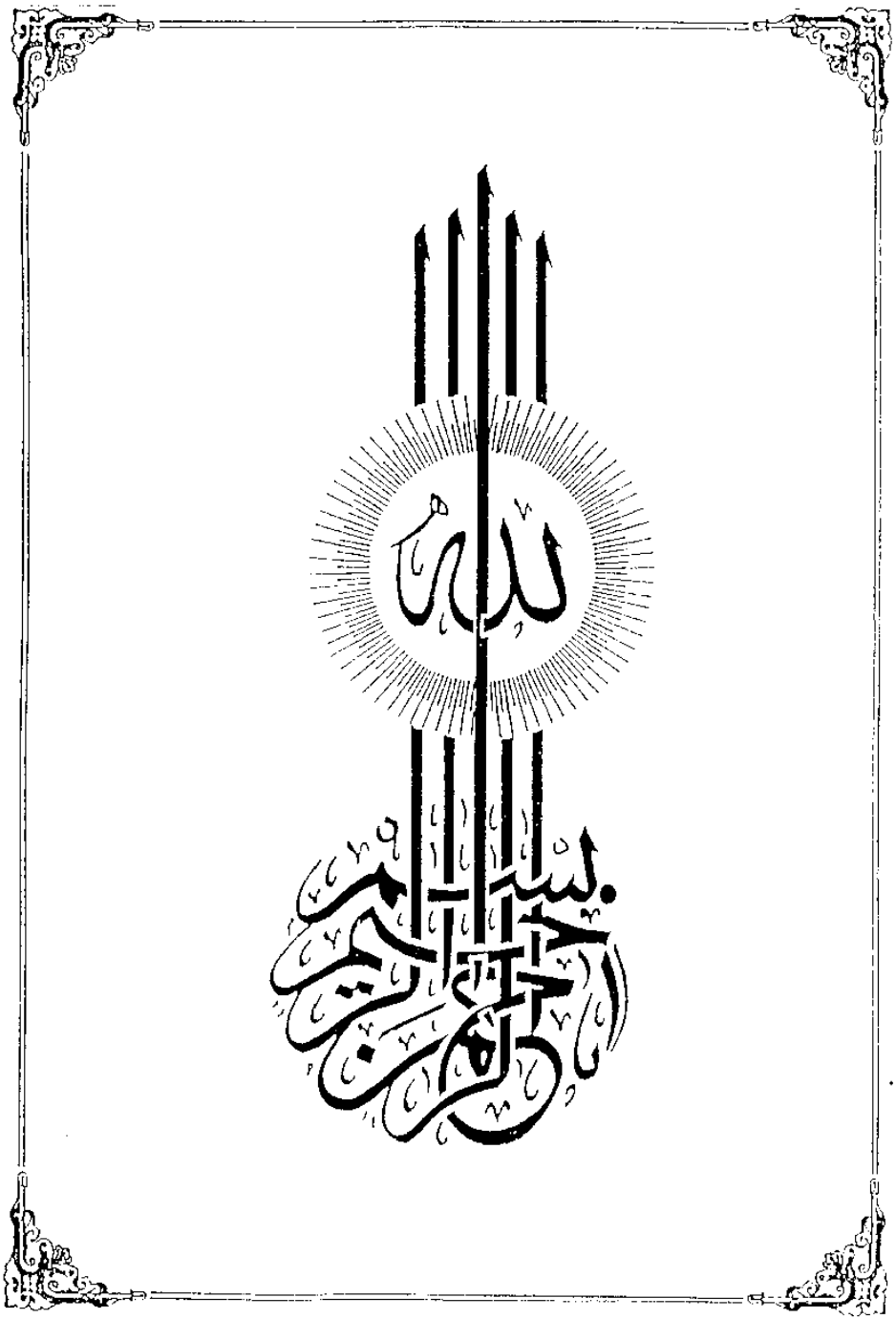

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C O N T E N T S

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INTRODUCTION

Varicocele is the term applied to dilatation and tortousity of the veins of the pampiniform plexus. (Campbell 1970). On the other hand, others define it as a state of varicosity of the cremasteric and occasionally the testicular veins (Baily and Love's 1977). It has been estimated that 99% of varicoceles occur on the left side, while the remainder exist on the right side alone or as a bilateral condition. In the past, it has been thought that varicocele is an innocent condition that could maximally be accompanied by a scrotal or groin pain, without serious complications. The only indication for operative interferance has been for long the admission to the military survice.

Selbi Tullock (1952) was the first to draw the attention to varicocele as a cause of subfertility. This has been emphasized later on by other investigators as Davidson (1954), Tulloch (1955), Scott (1960) Charny (1962), and Rains & Copper (1976). The direct relationship between varicocele and infertility is an open question. If varicocele is a significant aetiological factors in some cases of male infertility, several hypothesis have been suggested but none has

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been proven conclusively (Turner 1983):

1. Increased scrotal temperature in men with varicocele.
2. Retrograde flow of adrenal steroids through the internal spermatic vein into the testis (collateral venous communication between the two testes would explain the bilateral effect in this usually unilateral condition).
3. Stasis of blood with subsequent hypoxaemia and tissue degeneration.
4. Deficient testicular testosterone production with subsequent deficient spermatogenesis.

There are two lines of treatment of varicocele. The surgical one which includes many operative procedures as; High ligation, multiple ligatures and tunical sling operation. The non-surgical techniques include obliteration of the spermatic veins either by sclerosing material or introduction of a foreign body as metalic coil (Gianturco coil) and detachable balloons, which causes thrombotic occlusion of the internal spermatic veins.

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ANATOMY OF SPERMATIC CORD AND BLOOD SUPPLY OF THE TESTIS

When the testis descends through the abdominal wall into the scrotum it carries its vessels, nerves and the deferent duct with it. These structures meet at the deep inguinal ring and together form the spermatic cord. Which suspends the testis in the scrotum, and extends from the deep inguinal ring to the posterior border of the testis. The left spermatic cord is a little longer than the right. The spermatic cord traverses the inguinal canal, having the walls of the canal as it's relations, with the ilioinguinal nerve inferior to it (Gray's 1981).

As the testis passing through the canal it aquires coverings from the layers of the abdominal wall, which form the fasciomuscular tube of the spermatic cord. (Shafik et al., 1972) and (Shafik 1973). This fasciomuscular tube consists of 3 layers:

1. The internal spermatic fascia: It is the inner layer of the fasciomuscular tube. It starts at the deep inguinal ring as a prolongation of the fascia transversalis. Thus it invests the whole length of the cord, it consists of elastic fibres

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impregnated with collagen.

2. The cremasteric muscle and fascia: It consists of a number of muscular fasciculi, united by areolar tissue, and continuous with the internal oblique muscle of the anterior abdominal wall.

3. The external spermatic fascia: It is the outer layer of the fasciomuscular tube. It starts at the external inguinal ring as a prolongation of the external oblique aponeurosis. It consists of elastic fibres impregnated with collagen.

Coverings of the spermatic cord derives their blood supply from the inferior epigasteric artery via the cremasteric artery which anastomose with the internal spermatic artery at the body and tail of epididymis.

Venous drainage of the coverings is by the cremasteric vein to the inferior epigasteric vein.

Lymphatics of the coverings pass around the arterial supply to drain into the external iliac group of lymph nodes. (Gray's 1981).

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The arterial supply of the testis

The arteries of the testis and epididymis are:

1. The internal spermatic artery.
2. The deferential artery.
3. The external spermatic artery.

(Campbell 1970).

The internal spermatic artery (Testicular artery).

The internal spermatic artery arises from the front of the aorta immediately below the renal artery and passes obliquely downwards and laterally behind the peritoneum, resting on the psoas major muscle. The right artery lies infront of the inferior vena cava and behind the horizontal portion of the duodenum, the right colic and ileocolic arteries, the root of the mesentery, and the terminal part of the ileum. The left artery passes behind the inferior mesenteric vein, the left colic artery and the lower part of the descending colon. Each artery passes infront of the genitofemoral nerve, the ureter and the lower part of the external iliac artery. It sends a branch to the ureter as it crosses the latter structure and continues with the spermatic cord through the inguinal canal to the medial side of the epididymis. Before entering the testis, a small branch is sent to the globus major.

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The deferential artery (Artery of the vas deferens):

It arises from the inferior vesical artery and lies in close contact with the vas deferens until it reaches the globus minor, where it branches into a capillary network supplying the tail and body of the epididymis.

The external spermatic artery (Cremasteric artery):

The cremasteric artery arises from the inferior epigasteric artery and is directed to the internal inguinal ring where it assumes a position in the sheath of the spermatic cord and continues to the parietal surface of tunica vaginalis and anastomoses with the capillary network of the epididynis and neighbouring testicular vessels of the internal spermatic artery. (Campbell 1970).

The venous drainage systems of the testis:

There is a dual venous drainage for the testis and epididymis: The deep or primary system and the superficial or secondary system.

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The primary system consists of the internal spermatic, the ductus deferens and the external spermatic veins.

The secondary system consists of the superficial and deep inferior epigastric veins, superficial circumflex and scrotal tributaries of the superficial and deep external and internal pudendal veins.

These veins communicate freely with each other and the primary system through the cremasteric branches of the external spermatic vein at the level of the external ring (Lich and Howerton, 1979). There is also a vasal vein which drains into the superior vesical vein. (Brown et al., 1967).

The veins of the primary system form the convoluted venous pampiniform plexus. This plexus is arranged into three groups of veins: The anterior or the internal spermatic veins accompany the internal spermatic artery. The middle group of veins accompany the ductus deferens. The posterior group is the external spermatic. All these groups anastomose freely with each other near the testis.

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The pampiniform plexus constitute the chief mass of the spermatic cord and ascends along the cord, infront of the ductus deferens. Below the superficial inguinal ring, the veins of the plexus unite to form three or four veins, which pass along the inguinal canal, and entering the abdomen through the deep inguinal ring, coalesce to form two veins, which run upwards infront of the psoas major and the ureter, behind the peritoneum, lying one on each side of the testicular artery. These two veins join to form single vessel, which on the right side opens into the inferior vena cava at an acute angle, a little below the level of the renal vein. On the left side it opens into the left renal vein at a right angle. The testicular veins are provided with valves. The left vein passes behind the lower part of the descending colon and the lower margin of the pancreas and is crossed by the left colic vessels. The right spermatic vein passes behind the terminal part of the ileum and the horizontal part of the duodenum, and is crossed by the root of the mesentery, the ileocolic and the right colic vessels (Gray's 1981).

Etriby et al., (1975) have shown the profuse cross communications between the right and left

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pampiniform plexuses above the external inguinal ring. These anastomoses exist at several levels, including the pubic bone, inguinal canal and above the internal inguinal ring.

In (1950) El-Sadr and Mina, demonstrated in cadavers marked collateral venous circulation including contralateral communications.

The pampiniform plexus lies in the anterior compartment of the spermatic cord infront of the thick transverse fascial septum derived from the internal spermatic fascia. It is thus enclosed within a tube of this fascia and is supported externally by the cremasteric muscle.

The vasal plexus is a small plexus which lies behind the transverse fascial septum. The plexus as well as the ductus and its artery are enclosed within anarrow tube of the internal spermatic fascia.

The cremasteric plexus, as a whole lies outside the internal spermatic fascial tube and its veins are generally smaller than those of the pampiniform plexus, poorly muscularized and non-valved.

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There are a big number of smaller communicating veins passing between the cremasteric, pampiniform and vasal plexuses. They are poorly muscularized and non-valved.

Lymphatics of the testis and epididymis:

Lymphatics of the tesis and epididymis run back with the testicular artery to the para-aortic lymph nodes lying a longside the aorta at the level of the origin of the testicular artery opposite the second lumbar vertebra. (Lich and Howerton, 1970).

Nerve supply of the testis and epididymis:

The testis and epididymis are supplied by sympathetic fibres that reach the testis along the testicular artery. The sympathetic nerve fibres arise from the 10th thoracic segment of the cord as a pre-ganglionic fibre. Then they reach the coeliac ganglion via the greater or lesser splanchnic nerves. The postganglionic nerve fibres reach the testis along the testicular artery.

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Sensory fibres run up with the testicular artery and pass through the coeliac plexus and lesser splanchnic nerve to cell bodies in the posterior root ganglion at the 10th thoracic spinal nerve (Last, 1978).

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