EVALUATION OF THE CREMASTERIC VENOUS PLEXUS IN PATIENTS WITH PRIMARY VARICOCELE

M.S.THESIS IN GENERAL SURGERY

BY

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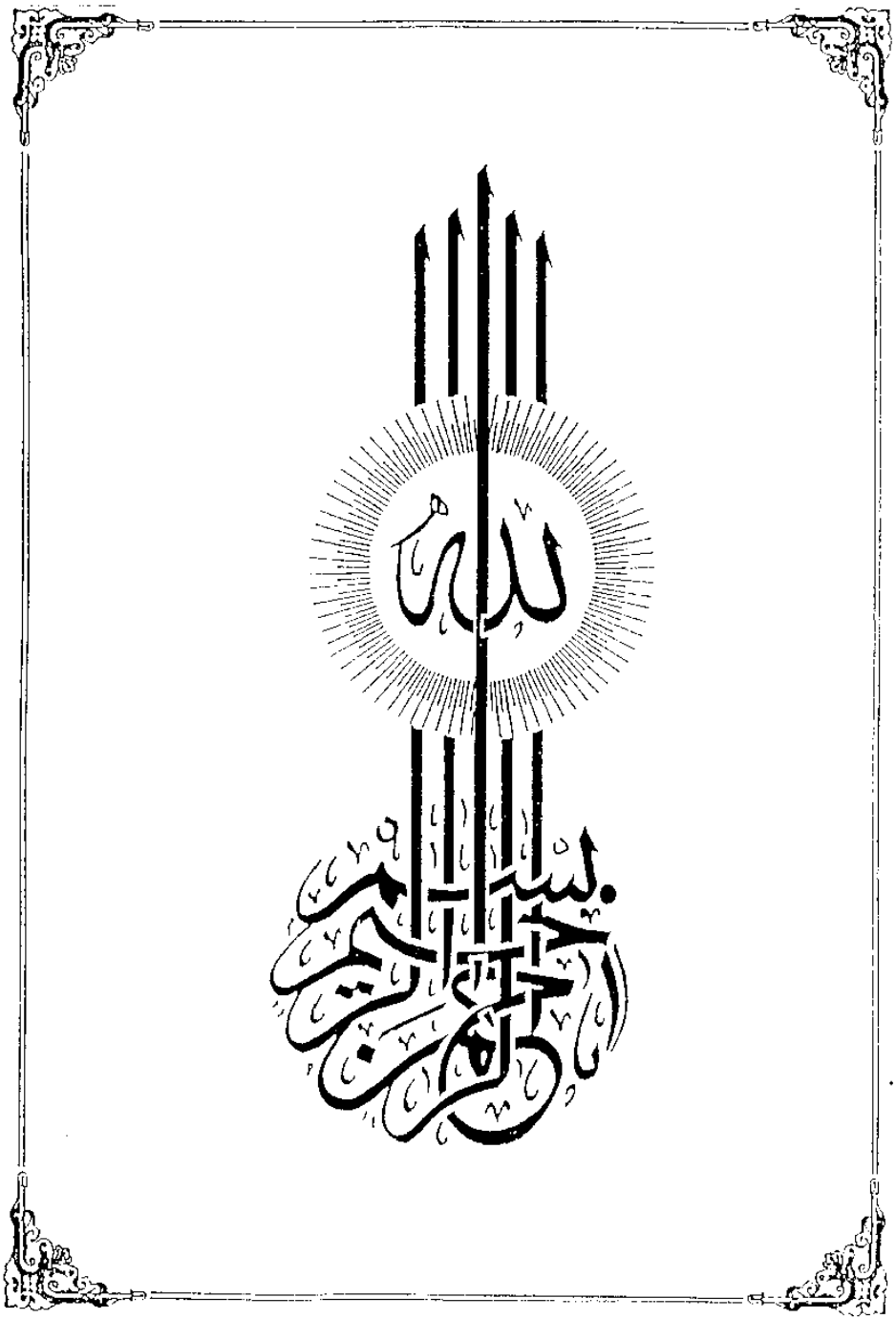
TO MY FAMILY

Samer

Ahmed

Lenah



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CONTENTS

INTRODUCTION

ROLE OF CREAMSTERIC VENOUS PLEXUS IN VARICOCELE .

This study attempted the clarification of the role of the cremasteric venous plexus in the formation of varicocele.

preoperative retroperitoneal venography was attempted in 6 cases .This involved both left testicular venography as well an attempt at inferior epigastric venogarphy to assess reflux at the cremasteric vein ostia into this vein.

Testicular venography was successful in all cases ,however inferior epigasteric venography failed in half of the cases with non selective filling of the inferior epigasteric veins in the rest .No reflux could be detected within the inferior epigasteric vein.

Preoperative colour coded doppler was performed to detect reflux inguinal canal in patients with varicocele as well as reflux over the inferior epigasteric vein.

The patients under study were divided into two groups : the first group presented to the andrology department and was operated upon through an inguinal approach (***Ivanissevitch operation***) .

Whereas the other group was operated upon using a modified Shafik's operation through a scrotal approach . In this latter technique the cremasteric varicosities were stripped and the pampiniform plexus was not attacked but instead the fasciamuscular cremasteric muscle tube was plicated.Postoperative colour coded doppler revealed loss of reflux detected over the inguinal canal in about 80% in the second group .Long

term follow up results of the seminal parameters in these patients is awaited to finally assess the success of this technique.

Application procedure is effective in management of reflux as well as being safe as regards the possibility of interfering with arterial supply or lymphatic drainage of the testis and epididymus.

It is hoped to extend the use of this operation to patients presenting for infertility in a future study .

ANATOMY

THE TESTIS

The testes are the reproductive glands in the male,suspended in the scrotum by the spermatic cords,and the left one is some what lower(about 1cm)than its fellow.The average dimensions of the testis are from 4cm to 5cm in length,2.5 cm in breadth and 3cm in anteroposterior diameter ,Its weight varies from 10.5 to 14 gm. Each testis has an ellipsoidal form,compressed laterally ,and has an oblique position in the scrotum,the upper pole is tilted forwards and laterally the lower,backwards and medially .The anterior border is convex and looks forwards and downwards;the posterior border ,nearly straight ,looks backwards and upwards*(William and Dyson 1992)*

It is an oval organ possessing a thick covering of fibrous tissue,tunica albugenia .Epididymis is attached to its postero-lateral surface.The vas deferens lies medial to the epididymis,connected to its inferior pole.The front and lateral parts of the testis lie free in a serous space formed by the overlying tunica vaginalis which also covers the anterolateral part of the epididymis.

Testis,epididymis and tunica vaginalis lie in the scrotum surrounded by thin membranes which are downwards prolongation of the coverings of the spermatic cord.The appendix testis is a sessile cyst 2x3 mm in diameter attached to upper pole of the testis within the tunica vaginalis*(Last,1990)*.

HISTOLOGICALLY :-

The testis has a thick white capsule called the tunica albugenia which is thickened along its posterior border to form the mediastinum testis

From the mediastinum testis,fibrous septa radiate into the testis dividing it into 400 lobules .Each lobule contains 2-3 seminiferous tubules.each one show several layers of cells,the basal of which is the germinal epithelium which produces the spermatids.Every two seminiferous tubules unit to form a single straight tubule.These straight tubules enter the mediastinum testis and break into a network of canalculi known as the rete testis .From the upper part of the rete testis arise about 15-20 vasa efferentia .The latter enter the commencement of the canal of the epididymis ,thus attaching the globus major(the head of the epididymis),to the testis*(Last 1990).*

The testicular capsule(tunica vaseulosa,albugenia and vaginalis) is not as previously thought an inert covering of the testis but act as a dynamic membrane capable of periodic contractions.These contractions probably serve to maintain the correct pressure within the testis.regulating movement of fluid out and back into the capillaries ,and to massage the duct system and thus aid in the movement of spermatozoa in an inward and outward direction*(Lesson et al.1985).*

THE EPIDIDYMIS :-

This is a firm structure ,attached behind the testis with ductus deferens to its medial side.

It is a single tube 6 meters(20 feet)long,highly coiled and packed together by fibrous tissue.It has a large head globus major(the upper pole) a smaller lower pole globus minor or the tail and a connecting intervening body.

A narrow slit between epididymis and testis is known as sinus of the epididymis .This sinus with the anterior half of the epididymis lie within the tunica vaginalis.

The head receives the vasa efferentia from the rete testis and is thus firmly attached to the testis ,however a part from the head of the epididymis there is no functional connection between the epididymis and the testis

THE VAS DEFERENS -

The vas deferens is the direct continuation of the epididymis It is provided with thick wall of smooth muscle and passes up and medially to enter the spermatic cord.The spermatic cord passes through the external inguinal ring to enter the inguinal canal.The vas deferens crosses the internal ring to the side wall of the pelvis under the peritoneum it curves round the lateral side of the inferior epigastric artery and crosses the pelvic cavity towards the seminal vesicles.

The duct of the seminal vesicles join the vas deferens to form the ejaculatory duct that opens into the prostatic urethra*(Last,1990)*.

THE SPERMATIC CORD

It is a long rounded bundle that extends from the deep ring to the scrotum where it terminates behind the upper end of the testis .

The spermatic cord is covered by 3 tubular sheaths derived from the abdominal wall during descent of the testis.They are the internal spermatic fascia derived from the fascia transversalis at the deep ring;the cremasteric muscle and fascia from the internal oblique and transversus abdominis and finally the external spermatic fascia from the external oblique aponeurosis at the external ring.

These 3 tubular sheaths from a fascio-muscular tube.Microscopic studies showed the tubal fascia to consist mainly of elastic fibers impregnated with collagen and arranged in a criss cross pattern lending the fascia a textile nature fig(1) *(Shafik et al 1972)*.

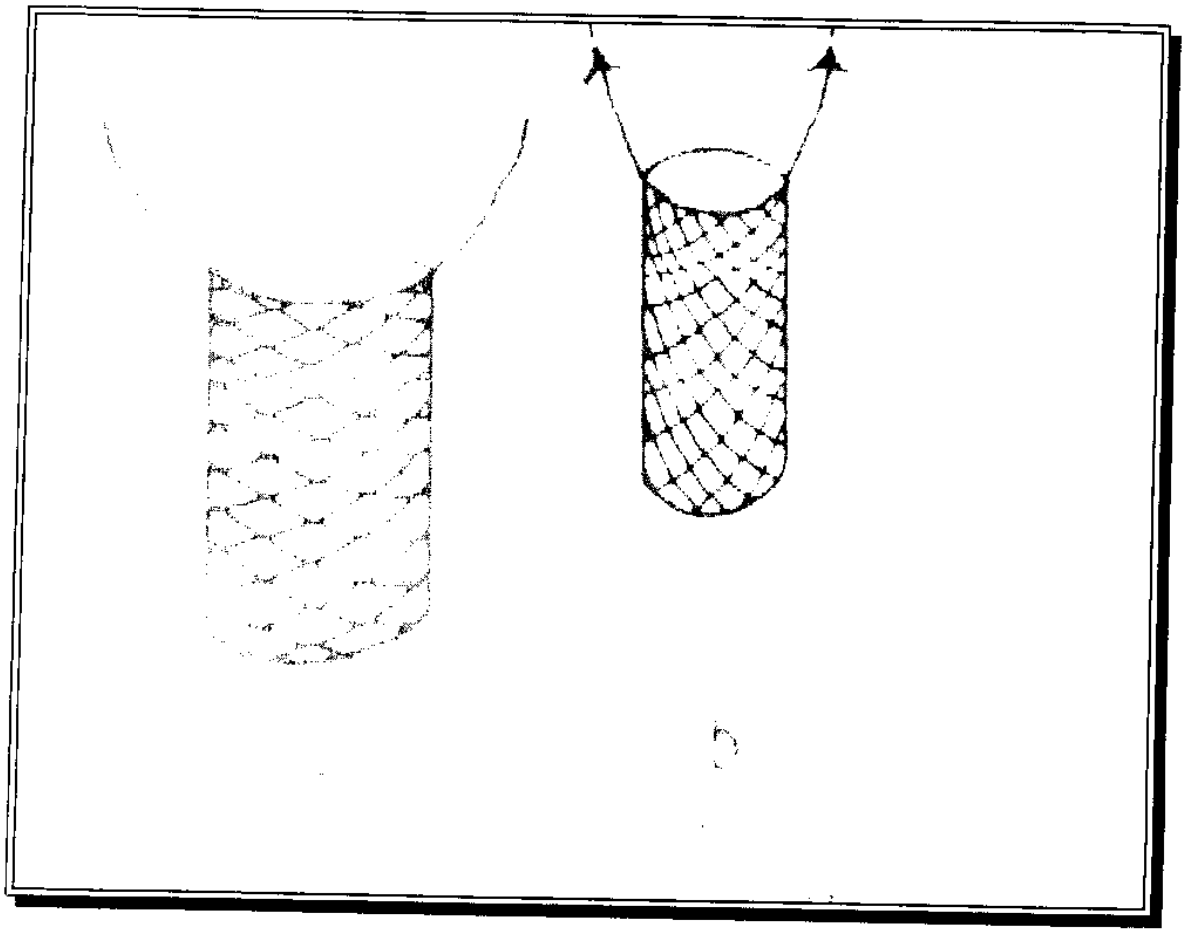

Fig (1) Diagram of the sphincteric action of the fasciomuscular tube.a The tube at rest , b the tube during contraction ..After Shafik 1984.

The fascio muscular tube of the spermatic cord is divided into two compartments ,the anterior ,or pampiniform and the posterior ,or vasal,the two being separated by a "transverse fascial septum"deriving from the internal spermatic fascia.(fig 2) ***(Shafik et al 1972).***

The pampiniform compartment ,surrounded by a fascial tube from the internal spermatic fascia,encloses the pampiniform plexus and the testicular artery.The vasal compartment,surrounded by a similar fascial tube,ensheathes all of the ductus deferens with its artery,the vasal venous plexus and cremasteric internus muscle ***(Shafik 1973 b,Shafik 1976).***The lymphatics of the testis and epididymis and testicular sympathetic nerve fibers are also present within the spermatic cord***(Last 1990).***

The cremasteric layer is composed of muscular contribution from both the transversus abdominus and the internal oblique muscles.The transversus fibers spiral down the cord and return behind it to become attached to pubic tubercle.The internal oblique fibers,which form the contribution ,spiral around the cord to return partly to pubic tubercle,but mostly to the internal oblique itself.Both together constitute the cremaster muscle.

The areolar tissue between the cremasteric muscle fibers is continued down the cord as cremasteric fascia.

Shafik(1973)stated that there are two cremasteric muscles :The externus and internus muscle .The cremaster externus muscle arises from the internal oblique abdominus and transversus abdominus muscle.It extends along the spermatic cord and testicle,and inserts into the tunica vaginalis,It exists in three patterns :single ,double and most commonly diffuse fig(3).

The cremaster internus ,as identified in the human originates from the transversus abdominis and descends in the spermatic cord,commonly

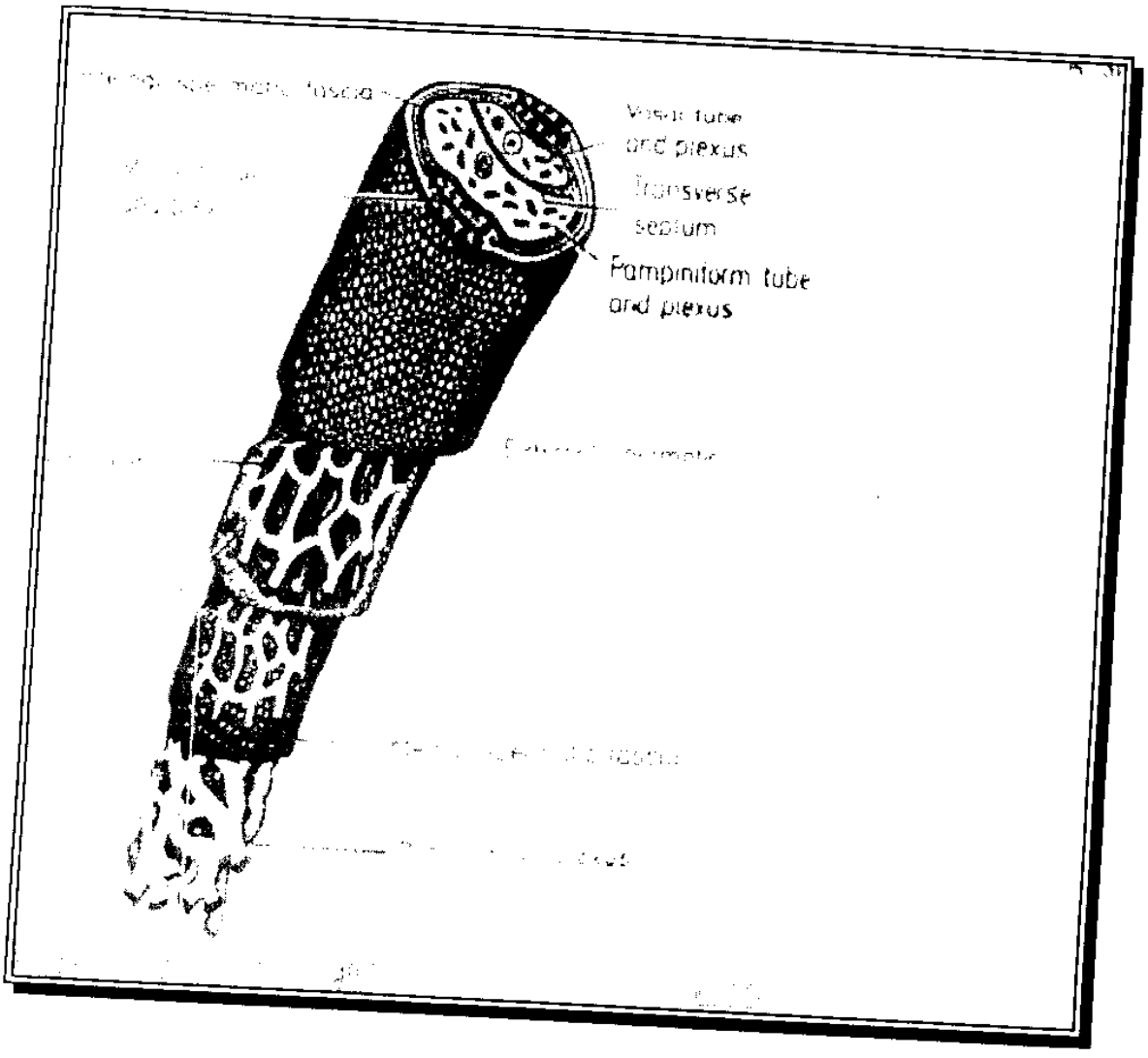

Fig (2) The fascio muscular tube and the venous plexuses related to it. The crisscross textile nature of the fasciae is demonistrated.After Shafik 1984.

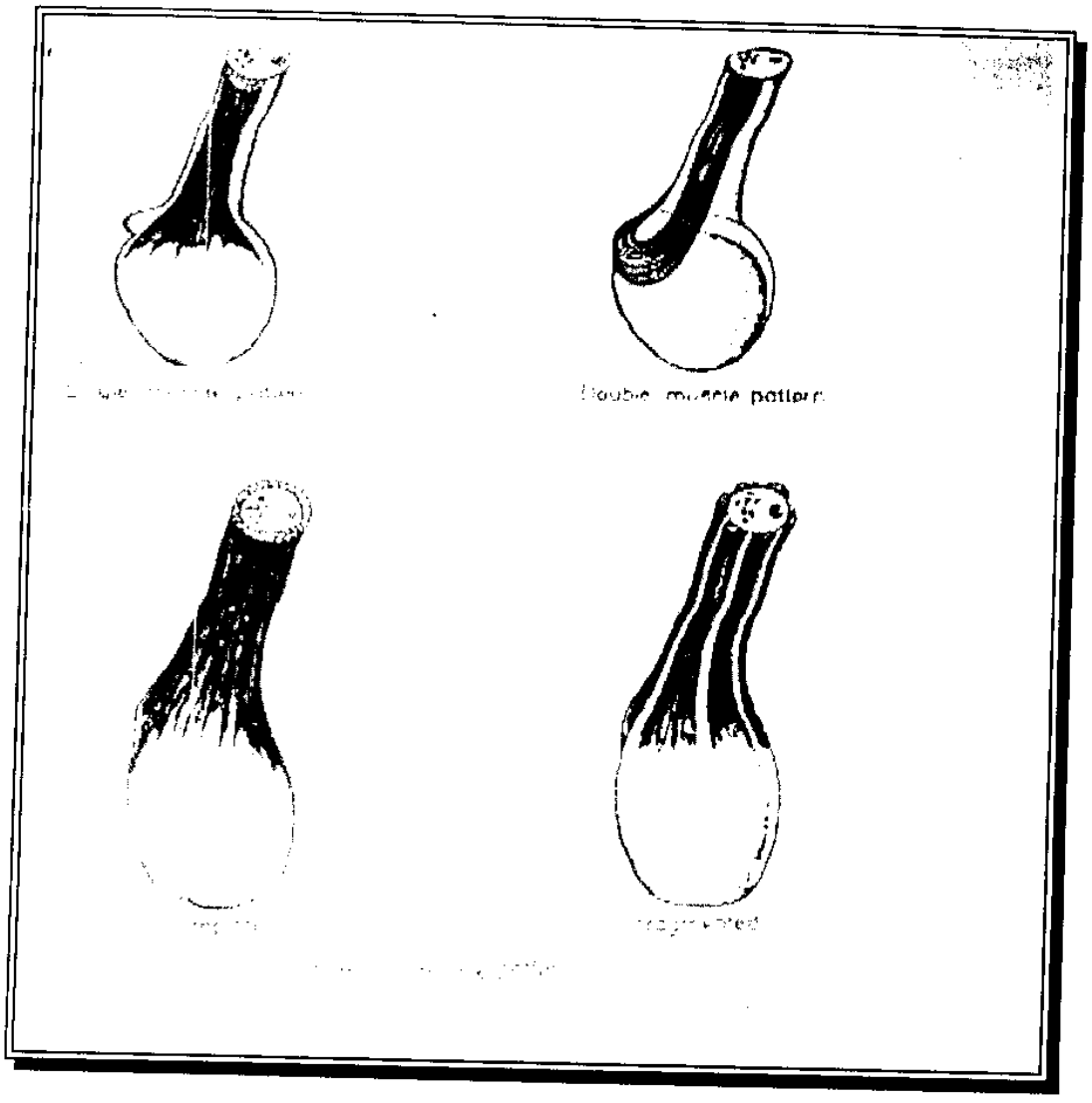

Fig (3) Diagram of muscle cremaster patterns .After Shafik 1984

in the vasal compartment and rarely in the pampiniform compartment .It inserts into the tunica vaginalis.*(Shafik 1973a).*

In spite of their similar origin and common termination ,there is no connection between the cremaster externus and internus since they are separated by the internal spermatic fascial tube.The cremaster internus muscle seems to help in the draining of the ductus deferens *(Shafik 1976).*

The nerve supply of the cremaster muscle arises from the genital branch of the genito-femoral nerve .This nerve crosses the lower end of the external iliac artery,and enters the inguinal canal through the deep inguinal ring,it supplies the cremaster ,and gives few filaments to the skin of the scrotum this nerve is also sensory to tunica vaginalis and spermatic fascia*(Last 1990).*

Shafik et al (1972) stated that the anatomical and histological structure of the fasciomuscular tube has shown that it has more important functions than being a mere fascial covering of the spermatic cord and the testicle.They added that it acts as an " autoelastic stocking" which supports the cord veins.In addition it constitutes a "pump" by which the blood is pushed up the cord.For this purpose ,the spermatic and cremasteric fascia are provided with a very large number of elastic fibers the crisscross pattern of fibers is thus necessary to its functional performance .The tube posses a sphincter action on the cord veins which is greatly potentiated by the contraction of the cremasteric muscle.This mechanism participates in pumping the blood from the testicle and the cord.

The pumping effect is augmented by division of the fasciomuscular tube into two compartments by the transverse fascial septum.The spermatic cord is thus composed of two units,each representing a separate pump containing its own venous plexus,the