Correlation between grade of varicocele , testicular volume , degree of impairement of semen quality and outcome after varicocele ligation

THESIS

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AKNOLEDGEMENT

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ABSTRACT

Purpose: To study the correlation between grade of varicocele, testicular volume, semen profile before and after varicocelectomy.

Methods: The study included 25 infertile men with clinical varicocele. We performed both scrotal ultrasonography and semen analysis before, after 3 and 6 months of varicocele repair. We calculated testicular volumes using the formula: Length × Width × Height × 0.71. The percentage of testicular volume difference (%) between the right and left testicles was calculated as (right testicular volume-left testicular volume) × 100 / right testicular volume.

Intervention: Inguinal ligation of the varicocele.

Results: Varicocelectomy resulted in significant improvement of ipsilateral testicular volume, sperm count per ml. and sperm motility for the twenty-five patients included in our study. and there is improvement in pregnancy outcome as 12(64%) patients out of 19 patients reached in our study had positive pregnancy outcome and the rest 7(36%) patients did not.the study also show insignificant inverse correlation between testicular volume difference and semen profile.

Conclusion: Varicocele repair improve ipsilateral testicular volume loss, semen profile and pregnancy outcome.

Key Words:
Anatomy, Physiology of spermatogenesis and hormonal regulation, Haemodynamics of the venous drainage of the Testis, Pathology of varicocele Diagnosis of varicocele, Treatment of varicocele.

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INTRODUCTION

Varicocele is defined as Ectatic and tortuous veins of the pampiniform plexus of the spermatic cord which are found in approximately 15% of male adolescents, with a marked left-sided predominance .It was documented in the 1880s that varicoceles predominated on the left side, were rarely observed before puberty, and in some cases were associated with ipsilateral testicular volume loss that appeared to be reversible in some correctable cause of male infertility**.** Approximately instances after varicocele **(Antônio Marmo Lucon,2005).**

The varicocele is the most common 90% of varicoceles are left sided. Whereas most studies report an approximately 10% prevalence of bilateral varicoceles, a few have reported a higher prevalence of bilaterality..
Varicoceles are associated with smaller ipsilateral testes in both adolescents and adults. In addition, ipsilateral testicular growth is often impaired in adolescents with varicoceles **(Evers JLH, Collins1995,WHO1992).**

In addition, an improvement in semen parameters as well as testicular volume has been reported after repair of adolescent varicoceles **(Schlegel, 1997., Wilets, I. F. and Nagler,1994).**

Varicoceles are associated with testicular atrophy and varicocele correction can reverse atrophy in adolescents.There is indisputable evidence that the varicocele affect semen quality. In fact, a classic semen analysis pattern has been attributed to varicoceles in which low sperm count and motility is found in conjunction with abnormal sperm morphology.The finding of

semen abnormalities constitutes the main indication for varicocele surgery in infertile men **(Steckel et al., 1993).**

Precisely how varicocele exerts an effect on the testicle remains unclear. several theories have been postulated:,it is likely that a combination of effects results in infertility. Pituitary-gonadal hormonal dysfunction , internal spermatic vein reflux of renal or adrenal metablites, and an increase in hydrostatic pressure associated venous reflux are also postulated effects of avaricocele.the most intriguing theory of how varicoceles affect testis function invokes an inhibition of spermatogenesis through the reflux of warm corporeal blood around the testis, with distribution of the normal countercurrent heat exchange balance and elevation of intratesticular temperature **(Hideo Sakamoto, Yoshio Ogawa, and Hideki Yoshida,2008).**

Semen samples from infertile men with varicoceles have demonstrated decreased motility in 90% of patients and sperm concentrations less than 20 million sperm/mL in 65% of patients. Varicocele repair has been demonstrated to result in catch-up growth in adolescents with varicoceles and ipsilateral loss of testicular volume **(Jarow JP2001).**

Testicular hypotrophy associated with varicocele is the most common indication for prophylactic varicocele repair in adolescents because varicocele associated with testicular hypotrophy may impair fertility in adulthood. However, few studies have evaluated the relationship between testicular hypotrophy associated with varicocele and fertility status**(F. PASQUALOTTO, A. M. LUCON, P. M. DE GOES, J. HALLAK, B. P. SOBREIRO,2005).**

Oligospermia refers to sperm densities of less than 20 million sperm/mL. Isolated oligospermia with normal motility and

morphology parameters is uncommon. In cases with less than 10 million sperm/mL, testosterone and FSH levels should be determined. **(Sakamoto H, Saito K, Oohta M, et al,2007).**

ANATOMY

Testis and Epididymis

The normal adult testis **(Fig.5)** is approximately 4 cm long, 3.5 cm wide and 3 cm thick, with a volume of about 30 cc. The left testis lies lower than the right testis but both testes are more or less symmetric in size ***(Hinman, 1995)*.**

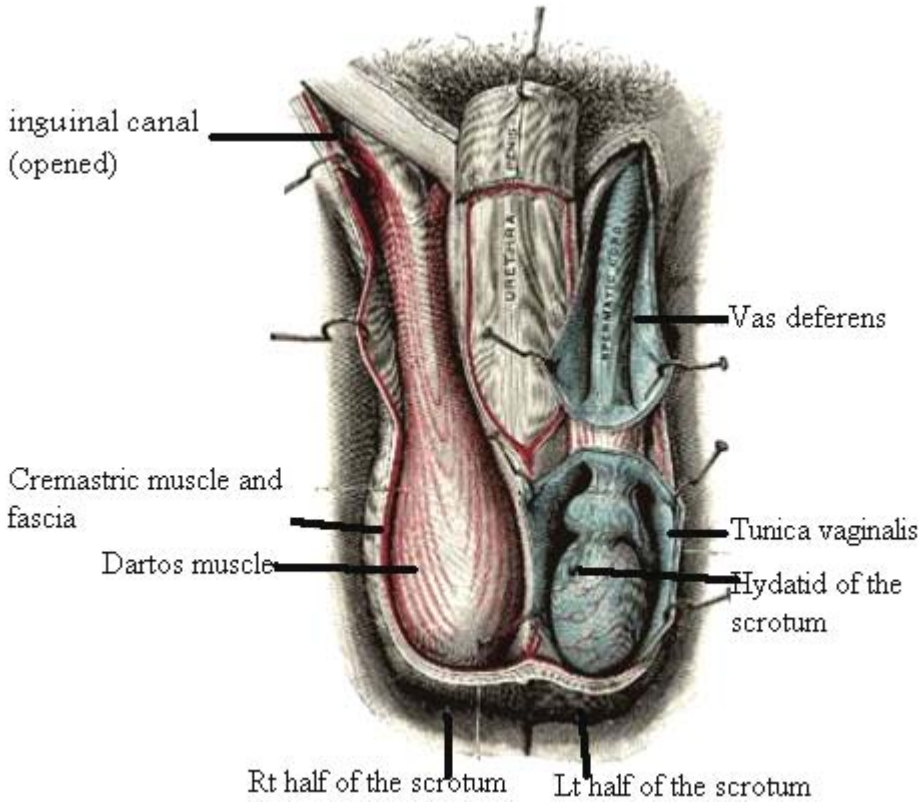

Fig.5: The scrotum. On the left side the cavity of the tunica vaginalis has been opened; on the right side only the layers superficial to the Cremaster have been removed ***(Quoted from Gray et al, 2005)***.

The entire testis except the posterolateral portion is covered by the visceral layer of the tunica vaginalis. Trabeculae (septa)

project form the tunica albuginea into the testicular substance, dividing the seminiferous tubules into lobules. Beneath the tunica albuginea is the tunica vasculosa. From the tunica albuginea, that forms the mediastinum of the testis, septulae divide the testis into as many as 300 conical lobules, each containing one or more convoluted seminiferous tubules that empty into 20 or 30 tubuli rectae. These enter the mediastinum to form the rete testis. Efferent ductules exit from the rete testis at the proximal end of the mediastinum and pass into the head of the epididymis. The epididymal duct arises from the conjoined ducts and joins the body of the epididymis and become larger as it continues to the tail of epididymis and emerges as the vas deferens ***(Hinman, 1995).***

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 ***(Sinnatamby, 2006).*** This tube is 18 inches (45cm) long. The vas passes from the tail of the epididymis to traverse the scrotum, inguinal canal, and so become to lie upon the side wall of the pelvis. Here, it lies immediately below the peritoneum of the lateral wall, extends almost to the ischial tuberosity then runs medially to the base of the bladder. Here it joins the more laterally placed seminal vesicle **(Fig.6)** to form the ejaculatory duct which traverses the

prostate to open into the prostatic urethra at the verumontanum on either side of the utricle ***(Harold, 2002).***

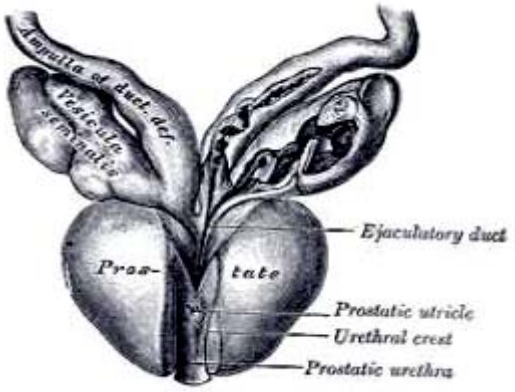

Fig.6: Vesiculae seminales and ampullae of ductus deferens, seen from the front. The anterior walls of the left ampulla, left seminal vesicle, and prostatic urethra have been cut away ***(Quoted from Gray et al, 2005)***.

The Spermatic Cord:

The spermatic cord **(Fig.7)** is a collection of structures passing to and from the testis. These structures are earned through the inguinal canal as the testis descends to the scrotum. The spermatic cord extends from the deep inguinal ring to the testis. It includes vascular, nervous, and reproductive structures. They are testicular artery and vein, efferent testicular lymphatic vessels, testicular nerves, ductus deferens and its associated artery and vein, also pampiniform plexus; a specialization of the testicular veins surrounds the spermatic cord immediately adjacent to the cranial pole of the testis and along the cord for a considerable distance ***(Smith, 1999).***