ORIGINAL ARTICLE

Male Infertility Secondary to Varicocele - A study of 75 Saudi patients

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ABSTRACT

Varicocele is a common condition worldwide but it is more prevalent in K.S.A. The aim of this study was to examine the effect of varicocelectomy on the fertility profile of affected men. A total of 75 men aged 12 – 70 years were diagnosed with varicocele during a period from July 2005 to September 2008. This included 67 Saudi and 8 non – Saudi patients. Sixty eight (90.66%) patients were adults while 7 (9.33%) were unmarried adolescent boys with 3rd degree varicocele presenting with scrotal pain and swelling. Fifty nine (86.76%) patients had infertility.Fifty three (89.83%) patients had reduced testicular volume and poor semen quality at presentation. All patients underwent sub inguinal open varicocelectomy. Restored testicular volume and improved semen quality were achieved within 1 year of follow – up in 49(92.45%) patients. Spouses of 35 (59.3%) patients achieved pregnancy during the period of follow – up after varicocelectomy while spouse of 24 (40.67%) patients did not conceive. No major complication was recorded after operation. It is recommended that where there are no facilities for microscopic varicocelectomy and embolization, open varicocelectomy is a safe, effective and simple technique to offer.

Key words: Male infertility, varicocele, adult male

INTRODUCTION

Varicoceles are abnormally dilated testicular veins (pampiniform plexus) in the scrotum which is normally secondary to internal spermatic vein reflux. The erect posture of man,obstruction by left renal artery,prolong venous congestion due to unrelieved sexual excitement and obstruction by tumours are some of the aetiological factors[1].Varicocele is found in approximately 8-22% of general population, 21-39% of men with primary infertility and 75–81% of men with secondary infertility[2,3]. It is more common on left side. In adolescents the incidence of varicocele is approximately 15%. The abnormality is extremely rare in prepubertal boys.

Although most men with varicoceles are able to father children, there is abundant evidence that varicoceles are detrimental to male fertility. A study by WHO on over 9000 men showed that varicoceles are commonly accompanied by decreased testicular volume , impaired sperm quality and a decline in leydig cell function[4]. Another report by Johnson and Colleagues showed that 70% of healthy asymptomatic military recruits with palpable varicoceles had on abnormality in semen analysis[5]. Furthermore studies in animals[6,7] and humans[8,9] suggested that varicoceles cause progressive testicular damage over time. It appears that surgical repair of varicoceles not only halts this decline in testicular function but often reverses it. Recent studies employing non- operated control groups clearly indicate that varicocelectomy does improve pregnancy rates[10].

How varicoceles decline the testicular function is multifactorial. Unrelieved venous stasis interferes with testicular temperature regulation which is usually maintained at 2-3°C less than core body temperature [11].Continuous exposure to high temperature causes sub fertility by decreasing testicular volume, spermatogenesis, semen quality and an increase in immature sperms in the ejaculate[1].

The surgical treatment of varicocele (Varicocelectomy) involves ligation of testicular veins. Access to the vein can be gained through sub inguinal, trans inguinal or supra inguinal incisions. The operation can be alone either by open, Laparoscopic, microscopic or embolization unilaterally or bilaterally[12,]

PATIENTS AND METHODS

This was a 3 years prospective study conducted at Arar Central Hospital (ACH) and Prince Abdulaziz Bin Musaad Specialist Hospital (PABMH), Arar K.S.A. The purpose of the study was to evaluate the effectiveness of varicocelectomy in treatment of male infertility due to varicocele.

Arar City is capital of North Boundaries of KSA with a population of about 400, 000. The two hospitals named above are the two main hospitals catering for all the urban and the sub – urban

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population. Patients were referred to us from various dispensaries while a large number of them presented to us directly. Few patients were referred from gynaecology department where wives were being investigated for infertility.

All the men who presented themselves in the Urology Departments of ACH and PABMH during the period had semen analysis and were studied using a standardized performa including data, such as age ,year of marriage , use of hormonal drugs , primary or secondary infertility problems in spouses. Those who had infertility not due to varicocele were excluded from the study. Testicular volume was assessed by digital palpation and scrotal ultrasound. Azospermia was defined as absence of spermatozoa in semen, oligospermia as count less than 20 million / ml asthenospermia as motility less than 50%, teratospermia as abnormal morphology more than 50% and macrospermia as dead spermatozoa. The patients were assessed at 3 monthly intervals for 1 year after the operation. The grade of varicocele was calculated as:

Classification	Definition
Clinically palpable	
Grade III (Large)	Easily visible on inspection.
Grade II (Medium)	Palpable at rest , invisible (without valsalva maneuver)
Grade I (Small)	Palpable with valsalva maneuver
Sub – clinical (not palpable)	Veins larger than 3 mm on ultrasound, Doppler reflux on valsalva maneuver.

RESULTS

A total of 75 patients including 67 Saudi and 8 non-Saudi patients during the period from July 2005 to September 2008 were included in the study. Sixty eight (90.66%) patients were adult, married, males whereas 7(9.33%) patients were adolescent boys who presented with symptoms of scrotal pain and swelling. They were not included in follow up. Out of 68 patients who were diagnosed to be suffering from varicocele, 59(86.76%) patients had infertility. These patients had various grades of varicocele.

The results of semen analysis on presentation showed poor semen quality in 53 (89.8%) patients. All these patients with varicocele also had reduced testicular volume. All patients consented for varicocelectomy. Fifty nine varicocelectomies were done for infertility and 16 for other reasons. After varicocelectomy in 59 infertile patients 49(92.45%) patients had improved testicular volume and semen quality during follow – up. The spouses of 35(59.3%) patients achieved pregnancy whereas 24(40.6%) could not probably due to other causes (Table 1).

Table 1: Details of Men Who Presented With Varicocele

Variables	=n	%age
Number of males with varicocele	75	100
Adult Males	68	90.66
Adolescent Boys	7	9.33
Male Infertility Secondary to varicocele	59	86.72
Number of males with varicocele without infertility	9	13.23
Consented to varicocelectomy	75	100
Poor semen quality on presentation	53	89.83
Reduced Testicular Volume on presentation	53	89.83
Improved semen quality after varicocelectomy	49	92.45
Improved testicular volume after varicocelectomy	49	92.45
Non improvement of semen quality after varicocelectomy	4	7.5
Number of pregnancy after varicocelectomy	35	59.3

The incidence of B/L varicocele was 7 (9.3%) patients. One patient (1.69%) developed vaginal hydrocele during follow – up after operation. The patients were aged 16 – 70 years.The mean age was 34.53 years. The highest numbers were those aged between 31 and 40 years; 40 (68.5%) patients. A detailed analysis of the 59 patients who had infertility revealed that they were married for between 1 and 10 years. Forty three (72.88%) patients had primary infertility and 16 (27. 11%) patients had secondary infertility. Out of 59 patients of infertility 54 (91.5%) patients knew that they had abnormal semen quality while 40(67.7%) patients knew the cause of low quality semen was varicocele.

Table 2: Outcome in sub Fertile Males who Underwent Varicocelectomy

Variables	=n	%age
Those who presented with oligospermia	47	88.6
Those who presented with azospermia	6	11.3
Improved semen quality after varicocelectomy in oligospermia	47	100
Improved semen quality after varicocelectomy in azospermia	2	33.3
Improved testicular volume after varicocelectomy in oligospermia	47	100
Improved testicular volume after varicocelectomy in azospermia	2	33.3
Pregnancy of spouse in oligospermia group	34	72.34
Pregnancy of spouse in azospermia group	1	16.6
Overall pregnancy rate (59)	35	59.32

Hormonal drugs were used by 48 (81.35%) patients without benefit. Preoperatively 47 (88.6%) patients had oligospermia and all of them achieved normal testicular volume and semen quality after operation (100%) success while only 6 (11.3%) patients had azospermia and in these patients testicular volume and semen quality was improved in 2 patients recording 33.3% success (Table 2). Pregnancy was achieved by the spouses of 34 patients (72.34%) in oligispermic group and only 1 patient in azospermia group (20%).

Table 3 depicts the improvement in semen quality which occurred simultaneously with the increase in Testicular volume. Maximum increments were recorded during first 3 months for improvement in semen quality whereas improvement in testicular volume was noticed during first 6 months and remained steady thereafter. The highest number of pregnancies was achieved during first 6 months.

Table 3: Time taken for increase in testicular volume, improvement in semen quality and pregnancy to occur

Time lag (months)	Pregnancy in Spouses		Testicular Volume Increase		Semen Quality Improvement	
	Oligo	Azo	Oligo	Azo	Oligo	Azo
1-3	10	0	15	2	25	1
4-6	16	1	22	0	15	1
7-9	5	0	10	0	7	0
10-12	2	0	0	0	0	0
> 12	1	0	0	0	0	0
Group Total	34(72.34%)	1(16.6%)	47(100%)	2(33.3%)	47(100%	2(33.3%)
Overall Total	35(59.32%)		49(92.45%)		49 (92.45%)	

Oligo=Oligospermia, Azo= Azospermia

DISCUSSION

The results indicate that varicocelectomy improves testicular volume and semen quality[2,3]. Varicocele is reported to be very common in infertile males accounting for 86.76% in our study. The improvement in testicular volume and semen quality was 100% in oligospermic patients so was the pregnancy rate (72.34%) as compared to 16.6% in azospermic patients. Azospermic patients had a poor prognosis regarding fertility. Unrelieved venous stasis culminates in decreased testicular volume and poor semen quality as recorded in all the patients. When neglected the testes become atrophic with absence of spermatozoa in seminal fluid (azospermia)[1]. Even if there is improvement in testicular volume and semen quality, the pregnancy rate remained poor in azospermic patients.

In our study only 6(11.3%) patients presented with azospermia which is relatively low incidence of azospermia in infertile males with varicoceles. Probably this is due to early diagnosis and treatment in our study group and increased health awareness among the population, (67%) of patients knew the cause of low quality semen being varicocele. The onset of symptoms and subsequent presentation to the health facility were mainly in the middle age with a peek among those aged 31–40 years. Although most of the patients in our study presented within reproductive age group[6-7,15-17]. Varicocele may also affect young children and adolescents as presented in our study 7 patients presenting with scrotal pain and swelling.

The length of marriage before presentation in this study was between 1 and 10 years. Those who had secondary infertility were most reluctant to present. The 16 patients in this category delayed most in this study. The diagnosis of varicocele is mainly clinical, although the use of sophisticated facilities like Doppler Ultrasound scan enhances accuracy especially for subclinical types[13]. Digital palpation with patient in standing position and valsalvas maneuver were used to diagnose all the cases[1, 11]. Even in absence of orchidometer, a careful digital palpation can detect reduced testicular volume as was done in our study and others[18,19]. Combining these with seminal fluid analysis almost always confirm the diagnosis, testicular biopsy being added if doubt still persists[20,21]. Varicocele has been considered the most cost effective treatable cause of male infertility.

The standard treatment of varicocele is varicocelectomy which involves ligation of testicular veins. There are divergent views in the literatures, as to whether the infra, trans or supra inguinal approach is the best and whether unilateral or bilateral ligations should be done [1,15].We did all the varicocelectomies by open sub inguinal approach and in 7 cases bilateral varicocelectomies were done only one (1.69%) patient developed vaginal hydrocele during follow up. There was no recurrence of varicocele reported during 1 year follow – up. This is similar to the comparative study reported by Al – Kandari et al on all types of varicocelectomy[12]. There is a consensus in literature that hormonal drugs like

gonadotropin (HCG) have no benefit to improve semen quality in varicocele patients[12,21]. This was true in our study also. Irrespective of the method of ligation there is rapid improvement in testicular volume and parameters which is noticeable during first 6 months after operation[1,3,12,] This was also seen in our study. Pregnancy should occur as semen quality improves but causes of infertility in spouses reduced the chance to 59.3% pregnancies as against 92.45% restoration in semen quality in our study[2,13, 22]. There is therefore a need to encourage both couple to seek early medical attention so that gynaecological problems in spouses can be handled by gynaecologists simultaneously.

CONCLUSION

Varicocele remains the most surgically treatable form of male infertility. Correct diagnosis and early correction will ensure the best chance of successful outcomes in terms of post operative morbidity, improved semen parameters and pregnancy rates.

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