

Role of Varicocelectomy in the Management of Male Infertility

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ABSTRACT

Surgical repair of varicocele (Varicocelectomy is a fairly common surgical procedure performed in urological units. Several studies have shown that varicocele surgery can improve sperm counts or motility but randomized and controlled trials do not consistently show improved pregnancy rates.

The purpose of this retrospective study was to observe the effect of varicocelectomy on semen quality and pregnancy rates, in infertile males diagnosed to have varicocele.

Results: 16760 infertile male patients attending out patients urology department during a period of 9 years (2000-2009) were examined. Out of these total number, 6040 (36%) suffered from sub fertility because of purely male factors. Varicocele was clinically palpable in 1746 (33.2%). Surgery was offered to all but only 1401 accepted, who were then operated upon for high legations of varicocele. Where as 345 (19.8%) patients declined and were treated conservatively. The couples were followed up for two years to assess effect of varicocele surgery on semen parameters and subsequent pregnancy.

Key words: Infertility, Varicocele, semen quality

INTRODUCTION

Varicocele is an abnormal tortuosity and dilation of veins of the pampiniform plexus within the spermatic cord. Varicoceles are found in 40% of infertile men and 20% of all men in the general population. Highest occurrence is in men aged 15-35 years. Decreased sperm count, decreased motility of sperm, and an increase in the number of deformed sperm showing stress semen picture are related to varicoceles. It is generally believed that varicoceles, cause infertility by raising the temperature in the scrotum and decreasing sperm production.

Reduction in size of the testicles may be an outcome of varicoceles. Often, once the varicocele is repaired the testis will return to normal size. They are found typically on the left side of scrotum, but may also occur on the right side or they may be bilateral. Diagnosis is fairly simple through either physical exam or color Doppler ultrasonography. If a varicocele is found, surgery to ligate the abnormally dilated veins is recommended. If the varicocele is of significant size (Grade II or Grade III), about two thirds of men undergoing the surgery will see some improvement in the sperm quality. The reported pregnancy rates following surgery are in the range of 40%, but most pregnancies occur 6-9 months following surgery.

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MATERIAL AND METHODS

16760 infertile male patients presenting at the Infertility, Urology OPD during the period 2000-2009 were included in the study. Of these 11189 patients had combined male and female factor infertility while in 6040 (36%) only the male factor infertility was involved. Of these 6040 patients 1746 (33.2%) had clinically palpable varicoceles. Surgery was offered to all but only 1401(79.2%) patients accepted, who were then operated upon. Those who declined (345-19.8%) were treated conservatively.

The couples were followed up for two years to assess effect of varicocele surgery on semen parameters and subsequent pregnancy. The semen analysis was done according to the standard WHO procedure (©World Health Organization 1980, 1987, 1992, 1999 WHO LABORATORY MANUAL FOURTH EDITION)

RESULTS

Of the 1401 patients 70 % had left sided varicoceles, 23% had right sided varicoceles while 7% had bilateral disease. 409 patients belonged to the 20-30 year age group, 677 belonged to 31-40 year age group, 245 belonged to 41-50 years age group, while 98 patients were over 50 years old.

In 20% patient's duration of infertility was 1 year. 40% patients were infertile for the last 2 years, 18% for the last 3 years, 10% for last 4 years, 8% last 5 years, while in 4% of the patients the duration of infertility was more than 5 years. Preoperatively 20% patients had sperm counts of less than 10 million /ml.

42% had sperm counts within 10-20 million/ml range. 18% had counts between 20-40 million/ml. 15% had above 40 million sperms/ml while 5% had azoospermia. Of these 80% had oligospermia (less than 40 million/ml), 60% had teratospermia less than 30% normal morphology) and 63% had asthenospermia less than 50% motility).

Postoperatively oligospermia improved in 60% of the patients whereas teratospermia and asthenospermia also improved in 30% and 45 % of the patients respectively.

The overall pregnancy rates increased to 63% in the varicocelectomy group whereas it remained about 19 % in the group treated conservatively.

DISCUSSION

A varicocele is dilation and enlargement of the pampiniform plexus of scrotal veins that drain the testis. Defective valves within the vessels or compression of the vein by a nearby structure can cause dilatation of the veins, leading to the formation of a varicocele. Although constantly debated, varicoceles are clearly linked to male infertility.^[1] They occur in 15-20% of all males, in 40% of primarily infertile men and in 80% of secondarily infertile men². Though it is apparent that not all men with a varicocele will be infertile, varicoceles may be associated with deficits in sperm concentration, motility, or morphology. The simultaneous occurrence of all 3 of these abnormalities has been termed a "stress pattern"³. Such a pattern may be present in men with a varicocele but is not diagnostic of that lesion.

A varicocele in a juvenile patient presents a complex management problem. The fact that not all men with varicoceles are infertile has suggested that repair may not always be indicated in the juvenile patient whose fertility status is unknown. The question, then, is how best to evaluate the adolescent patient with a varicocele. The management goal is to prevent future fertility deficits while avoiding unnecessary surgery.

One useful parameter is testicular size. A decrease in the size of the ipsilateral testicle -- either on initial examination or during close follow-up is a widely accepted indication for offering surgical repair. A recent study has demonstrated that surgical correction of an adolescent varicocele allowed "catch-up" growth of the affected testis, resulting in testicular volume comparable to the contralateral gonad⁴.

The goals of varicocele repair are to relieve pain in symptomatic cases and to improve semen parameters, testicular function, and pregnancy rates in couples with male-factor infertility associated with

varicocele. Studies have shown that varicocele repair can improve all three of these in infertile men^{5,6} with a significant improvement in semen analysis seen in 60–80% of men.^[7] It is possible that varicocelectomy can halt further damage to testicular function and improve spermatogenesis, as well as enhancing Leydig-cell function (as reflected by an increase in postoperative serum testosterone levels in infertile men).^[8] Urologists might, therefore, have a valuable role in preventing future infertility and androgen deficiency^[9, 10] in aging men.

The clinical outcomes of varicocelectomy are also related to the size of the varicocele. Repair of large varicoceles results in a significantly greater improvement in semen quality than repair of small varicoceles.^[11,12] In addition, large varicoceles are associated with greater preoperative impairment in semen quality than small varicoceles. In the presence of small (grade I) varicoceles along with larger (grade II and III), contralateral varicoceles, greater improvement in semen parameters can be expected if repair is performed bilaterally, rather than only the larger side being repaired.^[13] Some evidence suggests that the younger the patient is at the time of varicocele repair, the greater the improvement after repair and the more likely the testis is to recover from varicocele-induced injury.^[14,15,16] The most common complications of varicocelectomy are hydrocele formation, varicocele recurrence, and testicular artery injury.

In a controlled trial of varicocele repair in infertile men that compared surgery with no surgery, the surgery group had a pregnancy rate of 44% at 1 year, compared with 10% in the no-surgery group¹⁷.

Controlled randomized published trials of varicocele surgery vs. no surgery, show equivocal pregnancy rates. Meta analysis of these studies showed no significant effect of surgery on pregnancy rates. A Cochrane review of eight randomized studies concluded that there is no evidence that varicocele treatment for unexplained infertility will improve conception.^[18] However, in retrospective cohort studies, improvement of semen quality is seen in 51-78% of men after varicocele repair, with an associated pregnancy rate of 24-60%.^[19] In randomized, controlled trials of varicocele repair in men with clinically palpable lesions and abnormal semen analyses, a doubling of baseline pregnancy rates has been observed with varicocele treatment. A study by Madgar et al^[6] has reported 60% pregnancy rate in the treatment group as compared to 10% in the control group. While in our study oligospermia improved in 60% of the patients whereas teratospermia and asthenospermia also improved in 30% and 45% of the patients respectively.

The overall pregnancy rates in our study increased to 63% in the varicocelectomy group whereas it remained about 19 % in the group treated conservatively.

CONCLUSION

This study showed the significant improvement in both qualitative and quantitative sperm parameters. The overall pregnancy rate increase to 63% in the varicocelectomy group comparing with 19% in the group conservatively.

Varicocele causes a progressive time-dependent decline in semen quality. However it remains the most correctable factor to improve semen quality. When present in the infertile male surgical correction should be strongly considered.

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