



CONTROVERSIES IN OB/GYN

Is varicocelectomy useful for treatment of male-factor infertility?

Yes. Varicoceles are detrimental to fertility, and surgery is more cost-effective than ART.

By Mark Sigman, MD



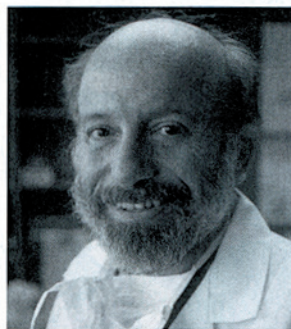
Few topics in male-factor infertility have evoked as much argument as has the value of varicocele repair in the infertile male. The improved success of assisted reproductive technology (ART) through the advent of intracytoplasmic sperm injection (ICSI) has refocused attention on this decades-old debate. The question may appear simple: "Does varicocele repair improve fertility in the infertile male?" but obtaining a definitive answer has been elusive. While many papers have reported the results of varicocele repair, only a few have been prospective, randomized trials. Despite the lack of consensus, a review of available data leads to the conclusion that varicocele repair has

continued on page 105

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No. Controlled studies show no benefit for varicocelectomy.

By Sherman J. Silber, MD



There is probably no subject more controversial in male-factor infertility than varicocele.¹ The overwhelming majority of infertility specialists throughout the world who are not urologists are extremely skeptical of the role of varicocele or varicocelectomy in treatment of male-factor infertility.

In fact, the directors of most assisted reproductive technology (ART) programs view the enthusiasm with which urologists approach varicocelectomy as a potential impediment to the couple who are aging and have little time left in which to take advantage of good pregnancy rates with ART.

Studies of varicocelectomy and infertility

There are many credible, well-controlled studies that

continued on page 109

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Controversies in OB/GYN focuses on controversial issues pertaining to the clinical practice of obstetrics and gynecology and reproductive medicine. The authors have been selected for their ability to articulate a particular point of view, regardless of their own personal convictions.

We hope that these short essays will provoke discussion and help *Contemporary OB/GYN's* readers clarify and refine their own practice management. You can join in the dialogue by completing and faxing in the response form at the end of this article or sending us your opinion (pro or con) via e-mail to judy.orvos@medec.com. A summary of the correspondence we receive will be published in a future issue.

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"No" continued from page 104

show no effect of varicoectomy on infertility.¹⁻⁹ Several of these studies involved careful randomization between infertile men with varicocele who underwent varicoectomy versus those who did not. There has been no difference noted, consistently, in pregnancy rates between the group undergoing surgery and the men who did not have the procedure. In addition, there are many studies that show no difference in the incidence of infertility in populations of either young military recruits or older men with varicocele compared with those without varicocele.¹⁰⁻¹²

There are a few "controlled" studies that favor varicoectomy, but they are extremely flawed by patient selection bias. One study involves 186 out of 455 patients undergoing varicoectomy with only 19 controls.¹³ Another study involved 1,500 infertile males who underwent varicoectomy and only 47 controls.¹⁴ With such lopsided retrospective control groups, selection bias is likely. The World Health Organization study, which was more well-conceived, still involved only 238 couples who were split off from the original study of more than 9,000 couples.^{15,16} Of these 238 couples, only 45 were actually included in the analysis, and the remaining 193 were dropped out for a variety of reasons. The report about the 45 couples on whom the "controlled" study was based was finally published in 1995, but thousands of other participants were dropped

out because of protocol deviations. Thus, the evidence in favor of varicoectomy is very thin.

Studies on semen parameters

The uncritical claim that semen parameters are improved by varicoectomy is also based only on

There was no statistically significant difference in pregnancy rate in those with varicocele vs. those without for older men undergoing vasovasostomy.

uncontrolled observations and the failure to take into account the variability of semen analysis in infertile men and "regression toward the mean."^{3,17} Many controlled studies have demonstrated that, because of intrinsic variability in sperm counts, men with an initially low sperm count later tend to have higher sperm counts despite receiving no treatment. Spontaneous pregnancies without treatment, as well as upward fluctuation of sperm count, are so common that there is much skepticism about many treatments for male-factor infertility that fail to show any effectiveness in

well-controlled clinical trials.^{3,5,17-25}

As far back as 1951, MacLeod and Gold first demonstrated that sperm concentration and motility tend to *increase with time* with repeated testing in oligospermic and asthenospermic men despite no treatment.^{26,27} This was a peculiar mathematical quirk related to the highly variable nature of the sperm count. That means that without any treatment whatsoever, if you *continue* to obtain sperm counts and semen analyses longitudinally on men who initially have a low sperm count and poor motility, the sperm count and the motility routinely will tend to increase despite no treatment.^{26,27} Baker and colleagues were the first to clearly and mathematically explain this phenomenon and they applied it to the varicocele controversy: "In a similar fashion, sperm motility increased in men with varicoceles whether or not they had testicular vein ligations performed."^{3,19,20,22}

No matter what the treatment, whether erythromycin or watchful waiting, clomiphene citrate or varicoectomy, an initially low sperm count (because of intrinsic variability) tends to gravitate higher because of "regression to the mean." Thus, whenever uncontrolled varicoectomy studies mention an improvement in motility or sperm count, this is simply what one often would expect to find with no treatment whatsoever.^{3,22}

Although it is thus widely viewed that varicoectomy does not affect treatment results in infertile couples,

there nonetheless has been a suggestion that the presence of varicocele might cause a progressive decline in sperm production (and testicular atrophy) as men get older. This

notion is contradicted by our 10-year follow-up of men undergoing vasovasostomy and their long-term results.¹² There was no statistically significant difference in pregnancy

rate in those with varicocele versus those without varicocele (78.5% vs. 81.2%) for these older men undergoing vasovasostomy and there was also no difference in postoperative

semen parameters. Our conclusion from this study was that the presence of a varicocele did not have any discernible effect on their long-term fertility.

Sperm count and conception

To understand the importance of a controlled study in evaluating the validity of varicolectomy, one has only to look at the spontaneous conception rates in the wives of men with various low sperm counts. With alarmingly low sperm counts, women can get pregnant without any treatment of the male.²⁸⁻³¹ Even in men with sperm counts as low as 2 million per mL or lower and even with a duration of infertility of as much as 4 years, 20% of the wives eventually have a spontaneous conception without ever having any improvement in the sperm.³² In men with sperm counts of 5 million per mL with only 1 year of infertility, 36% of the wives became pregnant without any treatment. Thus, if one had performed a varicolectomy on such men prior to their wives' conception, without a controlled study, we might mistakenly have concluded that the varicolectomy is what caused the pregnancy, even though it was simply a spurious, unrelated event.

Conclusion

It is easy to become enthusiastic about any treatment for male-factor infertility that is performed without adequate controls. But without a control group with which to compare, one should not be terribly

surprised to see in men with the most severe sperm defects a spontaneous pregnancy rate of 9% to 23% without any treatment, particularly if the couple has had a short period of infertility especially if the woman is young.^{18,32,33} With less severe sperm defects, spontaneous pregnancy rates can be considerably higher than that.^{2,3,19-22,34}

In medicine and science, we must follow evidence and never be driven by what we merely wish to be true. For the last 20 years, numerous controlled studies have failed to support the fantasy that varicolectomy has any major role to play in male infertility. □

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