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INVITED COMMENTARY

Male Fertility

Is varicocele repair necessary, given the advanced state of assisted reproductive technologies?

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Approximately, 1.6% of all infants born in the United States are conceived using assisted reproductive technologies (ARTs). With the growing rise of ART, questions have been raised about the utility of varicocele repair. While the ability of a microsurgical varicocele repair to improve semen parameters has been established, there remains no standard definition as to what constitutes significant improvements in semen parameters following varicocele repair. The majority of trials have observed enhanced parameters (specifically concentration and motility) as well as increased fertility.

Multiple meta-analyses have reviewed the voluminous existing data on varicocele repair and pregnancy rates, finding that correction of palpable varicoceles in the setting of at least one abnormal semen parameter improves the odds of spontaneous pregnancies.¹ Indeed, it is currently established that varicocele repair in men from couples with otherwise unexplained sub-fertility may improve a couple's chance for pregnancy. Unfortunately, this statement is based on low-quality evidence. More research is needed utilizing live birth or pregnancy rates as primary outcomes as opposed to changes in semen parameters.²

Debate often arises as to what is the most relevant surgical outcome following varicocele repair? While improvements in semen parameters are easily assessed, this contrasts with the goal of the infertile couple to translate laboratory results into increased pregnancies, birth rates, or improved ART outcomes. Varicocele repair has been shown to increase natural pregnancy rates and to mitigate the need for multiple ART cycles. This transmutes into cost-savings for couples and may decrease the risks of ART in female patients. Moreover, varicocele repair prior to *in vitro* fertilization through intra-cytoplasmic sperm injection improves live birth rates.³ Unfortunately, many reproductive endocrinologists (REs) are unaware of these studies; however, these concepts have been gradually gaining acceptance over the years. Given that the ability to intervene relies on the timely referral of the male

partner, continued education and enhanced communication between REs and andrologists are essential.

As noted by Pathak *et al.*,⁴ a growing area of interest in varicocele correction is focused on the patient with nonobstructive azoospermia (NOA). Varicoceles are found in 5%–10% of men with NOA and repair has been associated with the appearance of spermatozoa in the ejaculate in 8%–55% of cases, dependent upon the series.⁵ The caveat in these situations is that many of these patients still have insufficient sperm in the ejaculate to avoid future ART.⁶ Furthermore, varicocele repair can be combined with a testicular biopsy to determine whether spermatogenesis in men with NOA is present. Processing and cryopreservation of sperm from testicular tissue (if identified) can be conducted to harvest sperm at the same time as the testicular biopsy and varicocele repair, thus saving the patient future procedures. In cases where sperm does not successively appear in the ejaculate, varicocele repair has improved the chances of finding testicular sperm on subsequent fresh microTESE.⁷ In summary, randomized controlled trials are needed to further elucidate the role of varicocele in NOA. Nevertheless, varicocele repair remains an important component in the modern treatment of the infertile male.

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