Adolescent Versus Adult Varicoceles—How Do Evaluation and Management Differ?

In the management of varicocele fertility is the over-riding consideration. For the adult the concern is typically immediate, whereas for the adolescent preservation of future fertility is the primary objective. This fundamental difference largely determines the manner in which varicocele is managed.

In the adult population prospective, observational management is uncommon. The majority of varicoceles will be discovered in the course of infertility evaluation and, in conjunction with an abnormal semen analysis, will warrant correction. Others will present as a result of symptoms or patient displeasure with the presence of a scrotal mass and these, too, are corrected. Incidentally discovered varicocele associated with normal semen parameters in an adult actively trying to conceive does not mandate followup. In addition, adult males with varicocele are not routinely followed for testicular disproportion which, if absent at presentation, rarely seems to develop. One group that is followed is those in whom varicocele was discovered in adolescence and who may warrant a semen analysis every 1 to 2 years.

The situation is different for adolescents in whom varicocele is typically discovered early in puberty, or on routine examination or by the patients themselves. The future fertility status of these patients is unknown. What we do know is that 80% of adult males with varicocele will be fertile and, thus, a selective approach to the surgical management of adolescent varicocele has been advocated. Historically objective criteria for surgery have included varicocele grade, gonadotropin-releasing hormone stimulation studies, testicular disproportion and, more recently, semen analysis. Of these criteria testicular disproportion (hypotrophy) has been the most widely accepted. Our center and others have demonstrated that ultrasound calculated testicular volume measurements are more precise than those performed with orchidometers and, therefore, scrotal ultrasound has become a routine part of the initial evaluation at most major centers. It is less clear at what volume differential surgery is warranted and when is the optimal timing of intervention. In a study of adolescents with varicocele we found that when correlating testicular volume differentials with total motile sperm count significant abnormalities could be seen at greater than 10% which became prominent at greater than 20% (59% total motile sperm count less than 10 million). We found no correlation between varicocele grade and abnormalities in semen parameters. As a result we regard a persistent volume differential greater than 20% as an indication for surgery. Because normal boys may have asymmetric testicular growth in early puberty we confirm persistence of this volume differential for more than 1 year before surgery as advocated by Kolon et al.

In this issue of The Journal Kozakowski et al (page 2717) present another means of assessing adolescent varicocele, namely peak retrograde flow (PRF). This parameter is obtained using Doppler ultrasound measurement of retrograde flow in the largest branch of the spermatic venous complex with the patient in the supine position and performing the Valsalva maneuver. For patients who presented with a greater than 20% volume differential and a PRF greater than 38 cm per second (18%, 14 of 77) none had improvement in testicular hypotrophy. On the other hand if the initial volume differential was less than 20% and PRF was less than 30 cm per second, a differential greater than 20% was unlikely to develop. The authors proposed this measurement as a means of predicting ultimate testicular volume differentials, thereby allowing earlier appropriate surgery.

While these findings are intriguing one wonders about the reproducibility of the technique and its practical value. Because the technique relies on the Valsalva maneuver, which can be modulated, variability may result. Although 18% of patients were in the poor prognostic category and may have benefited from early surgical intervention, 32% (25 of 77) had improvement in testicular hypotrophy. On the other hand if the initial volume differential was less than 20% and PRF was less than 30 cm per second, a differential greater than 20% was unlikely to develop. The authors proposed this measurement as a means of predicting ultimate testicular volume differentials, thereby allowing earlier appropriate surgery.
throughout adolescence, suggesting no compromise in delay.\(^4\) On the other hand if the patients with a greater than 20% volume differential were older and in Tanner stage V, one could obtain a semen analysis and have access to the most important predictor of fertility.

When spermatic vein occlusion is indicated a variety of approaches are available but the optimal technique remains controversial. Surgical options include the Palomo (retroperitoneal mass ligation), Ivanissevich (inguinal), subinguinal and laparoscopic approaches, whereas interventional radiological techniques include embolization and sclerotherapy (antegrade or retrograde). Adult practitioners and infertility experts have embraced the microsurgical subinguinal artery sparing technique of Goldstein et al which is highly successful, and associated with low hydrocele rates and minimal morbidity.\(^5\) Pediatric urologists on the other hand favor the Palomo and laparoscopic approaches with or without artery sparing with more cautious adoption of the microscopic subinguinal approach. This preference may reflect the level of practitioner comfort with the microsurgical technique, with which infertility experts are facile. In our reported surgical experience at Children’s Hospital Boston success rates were equally high using the Palomo, laparoscopic and subinguinal approaches, but lower with the Ivanissevich technique.\(^6\) Artery sparing and the microsurgical technique did not compromise success rates but did reduce the rate of hydrocele. One case of testicular atrophy occurred with the subinguinal microscopic artery sparing technique.

Also in this issue Barroso et al (page 2724) present a meta-analysis of the Palomo and laparoscopic techniques in pediatric patients. In the broadest of strokes they found these approaches equally successful with and without artery sparing. Unfortunately the exclusion of important large studies and length of postoperative followup undermined their findings regarding hydrocele rates. Similarly the lack of detail regarding patient age and specific semen parameters renders comparative fertility rates uninterpretable.

One instructive omission from the meta-analysis by Barroso et al is any mention of testicular atrophy. This rare but dreaded complication has been reported with the microsurgical subinguinal and Ivanissevich techniques as well as with sclerotherapy.\(^7,8\) However, it has not been reported in association with an initial surgical approach above the internal ring and vasal vessels (Palomo, laparoscopic). In particular for the adolescent, in whom surgery is largely prophylactic and whose spermatic vasculature may be more vulnerable, a cautious surgical approach seems warranted.

ACKNOWLEDGMENTS
Mark Sigman and Abraham Morgentaler contributed to this editorial.

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