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Varicocelectomy in men with nonobstructive azoospermia: Is it beneficial?

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ABSTRACT

Objectives: To investigate the effect of open lymph sparing high ligation varicocelectomy in nonobstructive azoospermic men with palpable varicocele and determine predictive parameters of outcome.

Methods: After a standard diagnostic evaluation, a total number of 83 men with nonobstructive azoospermia (54 men with complete azoospermia and 29 with virtual azoospermia) and palpable varicocele underwent open lymph sparing high ligation varicocelectomy. Testicular core biopsy was also performed perioperatively in all patients. Varicocelectomy was performed bilaterally in 60 patients and unilaterally in 23. The outcome success was assessed in terms of improvement in semen parameters and spontaneous pregnancy. Four patients with recurrent varicocele were excluded from final data analysis.

Results: After a mean follow up of 7.4 months, motile sperm in the ejaculate could be identified in 27 (34.2%) nonobstructive azoospermic patients with a mean postoperative sperm count of $3.56 \pm 4.8 \times 106$/mL (range 0.3–18.9) and a mean sperm motility of $42.24 \pm 17.64\%$ (range 24–76). No predictive parameters of postoperative improvement other than testicular histopathology could be concluded. Of these 27 patients, 2 had Sertoli-only-cell pattern, 6 had maturation arrest at spermatid stage pattern, 13 had hypospermatogenesis and 8 had normal spermatogenesis. Spontaneous pregnancy was achieved in 6 (7.7%) patients. Of these 6 patients, 2 had maturation arrest at spermatid stage pattern, 2 had hypospermatogenesis and 2 had normal spermatogenesis. No predictive parameters of spontaneous pregnancy achievement could be concluded.

Conclusion: High ligation varicocelectomy may offer nonobstructive azoospermic men an opportunity to have motile sperm via ejaculate and even the chance of natural conception, instead of the more bothersome assisted reproductive techniques.

1. Introduction

A varicocele is observed in 10–20% of the general male population, in 35–40% of men with primary infertility, and in up to 80% of men with secondary infertility.[1–3] Although the pathogenesis of varicocele remains enigmatic, gross testicular alteration associated with varicocele are well documented.[4] The effect of varicocele is diverse but often can result in generalized impairment of sperm production characterized by abnormal semen quality, ranging from oligospermia to complete azoospermia.[5,6] The observation of azoospermia or severe oligospermia with varicocele is common and is reported to range from 4.3% to 13.3%.[7]

There is a clinical evidence to suggest that spermatogenesis in damaged or falling testes may vary within a single testis, resulting in focal or "patches" of sperm production within an organ largely devoid of germinative cells. It is assumed that a testis of a man with nonobstructive azoospermia might show a homogeneously or a non-homogeneously distributed spermatogenesis. In the former case, a large piece of testicular tissue will represent the whole testicular parenchyma, whereas in the latter case a large piece of testicular tissue might be negative for focal advanced spermatogenesis.[8]

For men with azoospermia or severe oligoasthenospermia, modest improvement in semen quality after varicocele repair may have a significant impact on couple's fertility options.[9] A primary benefit of varicocele repair in azoospermic men with spermatogenic failure is the possibility of producing motile sperm in the ejaculate.[10] Freshly ejaculated sperms have superior intracytoplasmic

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sperm injection success rates compared with sperm retrieved via testicular sperm extraction for spermatogenic failure and thus, an invasive and potentially damaging procedure is avoided.[11]

A few reports have independently found that microsurgical technique of varicocele repair in men with azoospermia resulted in induction or enhancement of spermatogenesis in 40–60% of patients, thus demonstrating the benefit of performing varicocele repair in men with azoospermia.[9,12–15]

The aim of our study was to evaluate the outcome of open lymph sparing high ligation varicocelectomy in nonobstructive azoospermic men with palpable varicocele and to determine predictive parameters of postoperative improvement.

2. Patients and methods

Between June, 2004 and June, 2007, eighty-four men with nonobstructive azoospermia (54 men with complete azoospermia and 29 with virtual azoospermia) and palpable varicocele presenting with primary infertility underwent varicocele repair at Endocrine Surgery Unit, Mansoura University Hospital. A detailed informed consent was obtained from all patients after approval from local ethics committee.

A minimum duration of infertility, defined as failure to establish a pregnancy within 12 months with unprotected intercourse, was required for study group entry. A basic infertility evaluation including a detailed history taking and a complete physical examination was undertaken.[16] Testis volume was assessed by a single examiner with the aid of an orchidometer. Testicular atrophy was defined as any testis with a volume less than 15 cc or a testis 25% or more smaller (volume/volume) than its contralateral mate.[9] A minimum of 3 preoperative semen analyses were obtained in all patients by masturbation after 2–5 days of abstinence. A minimum interval of 2 weeks separated all analyses. Semen specimens were collected and evaluated according to WHO criteria.[17] Only men with complete (pellet −ve) or virtual azoospermia (pellet +ve) were enrolled. Complete azoospermia was confirmed by the absence of sperms in the centrifuged semen pellet (pellet −ve) whereas virtual azoospermia was considered in case with any sperm on this pellet (pellet +ve). All men were fructose positive.

Varicoceles identified at scrotal examination, performed with the patient in the standing position and during Valsalva's manoeuvre, were classified as grade I (palpable only during Valsalva's manoeuvre), grade II (palpable without Valsalva's manoeuvre), or grade III (visible without need for palpation).[5] Scrotal ultrasound with real time colour Doppler imaging was used both to confirm the presence of varicocele and to demonstrate subclinical varicocele on the contralateral mate. When bilateral varicocele was palpable or detected by scrotal ultrasound, the larger size was reported.

Assay of serum FSH (normal: 0.7–11 mIU/mL), Immunobead test for antisperm antibodies and monoclonal assay for seminal white blood cells were also made. Patients with pyospermia were treated before varicocele repair. All men underwent genetic testing. None of the patients in this study had chromosomal abnormalities or Y chromosome microdeletions.

All men underwent varicocele repair, using modified open lymph sparing high ligation technique in which the internal spermatic artery and veins are ligated separately preserving only the lymphatics.

Each patient underwent diagnostic testicular core biopsy at the same time as the varicocele repair. Biopsies were performed on the healthier appearing testis based on size and consistency. All biopsies were analysed by an experienced pathologist and were classified as Sertoli-cell-only (SCO) pattern (Fig. 1), maturation arrest at spermatocyte stage, maturation arrest at spermatid stage (Fig. 2), hypospermatogenesis (Fig. 3) and normal spermatogenesis (Fig. 4).[18]

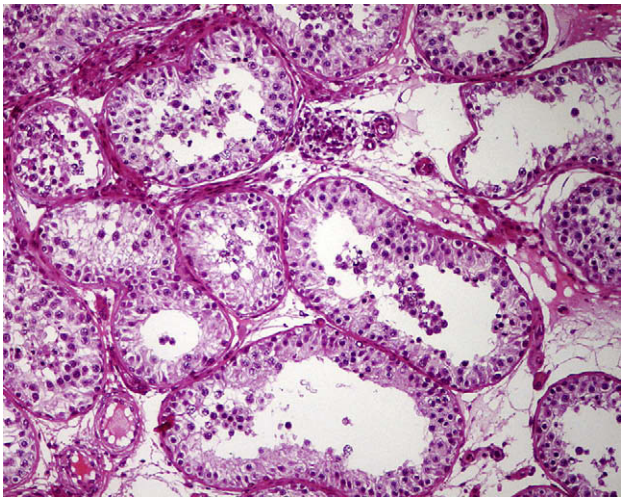

Fig. 1. Histology showing SCO pattern with focal areas of spermatogenesis. Original magnification ×10.

Postoperative semen analyses were obtained starting at 3 months after surgery. The laboratory technician was blinded to the diagnosis. The most improved postoperative semen analysis was used for data analysis. Enrolment criteria for men who have yet to contribute to a pregnancy included a minimum of 3 months of follow up and one semen analysis. Four patients with recurrent varicocele were excluded from final data analysis. Hydrocele formation occurred in 3 (3.8%) patients in whom aspiration was performed in one patient and surgical repair in the other 2 patients.

The incidence of semen parameters improvement and pregnancy achievement was correlated with different clinical, laboratory and pathological parameters. The Pearson Chi-square test was used with $p < 0.05$ considered significant.

3. Results

The mean age of the evaluated patients was 31.78 ± 3.97 years (range 25–40) and mean FSH values were 16.56 ± 8.32 mIU/mL (range 3.4–34). Testicular atrophy was bilateral in 54 (68.3%) patients, unilateral in 8 (10.2%) whereas 17 (21.5%) patients had normal testicular volume. The varicoceles were grade 2 in 42 (53.2%)

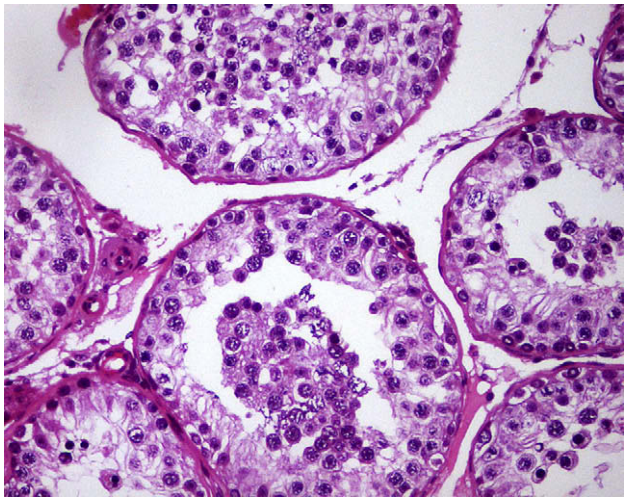

Fig. 2. Histology showing maturation arrest pattern. Original magnification ×20.