

Spontaneous pregnancy rates in Chinese men undergoing microsurgical subinguinal varicocelectomy and possible preoperative factors affecting the outcomes

Jing Peng, M.D.,^a Zhichao Zhang, M.D.,^a Wanshou Cui, M.D.,^a Yiming Yuan, M.D.,^a Weidong Song, M.D.,^a Bing Gao, M.D.,^a Zhongcheng Xin, M.D.,^a and Sainan Zhu, M.D.^b

^a Andrology Center and ^b Department of Biostatistics, Peking University First Hospital, Beijing, People's Republic of China

Objective: To investigate pregnancy rates after microsurgical varicocelectomy in Chinese infertile men with clinical varicoceles and to identify preoperative factors affecting the outcomes.

Design: Retrospective data analysis.

Setting: University infertility clinic.

Patient(s): One hundred seventy-six consecutive Chinese men with infertility and clinical varicoceles who underwent varicocelectomy from January 2010 to December 2011. Semen data were available for 145 patients, and pregnancy data were available for 66.

Intervention(s): Varicocelectomy was performed on all patients.

Main Outcome Measure(s): Spontaneous pregnancy rates and improvement in semen parameters after varicocelectomy.

Result(s): We followed 145 men (82.4%) for a median of 21 months (range 12–36 months) after varicocelectomy. For 109 patients (75.2%), both sperm concentration and forward motility improved. Overall, 45.5% (66/145) of female partners achieved spontaneous pregnancy at a mean follow-up of 11.7 ± 6.2 months. On univariate analysis, preoperative high sperm concentration (≥ 20 million/mL) and high sperm motility ($\geq 25\%$) were positively associated with spontaneous pregnancy. On multivariate analysis, only preoperative sperm concentration was an independent predictor.

Conclusion(s): Microsurgical varicocelectomy could improve semen quality and spontaneous pregnancy rates. Only preoperative sperm concentration was an independent predictor of spontaneous pregnancy. Patients with high initial sperm concentration may benefit from varicocelectomy for spontaneous pregnancy. (Fertil Steril® 2015;103:635–9. ©2015 by American Society for Reproductive Medicine.)

Key Words: Male infertility, varicocele, pregnancy, microsurgery

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Clinical varicoceles are present in ~15% of the general male population and in up to 35% of men with primary infertility and 75%

with secondary infertility (1). In fact, varicocele is the most commonly seen and correctable cause of male-related infertility (2). Guidelines relating to

varicoceles and infertility have been established by the American Urological Association and the American Society of Reproductive Medicine (3, 4). Both recommend varicocele repair in cases of a clinically palpable varicocele with documented infertility, one or more abnormal semen parameters, and normal or potentially correctable female fertility.

Varicocelectomy can improve semen parameters and spontaneous

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Reprint requests: Zhichao Zhang, M.D., Andrology Center, Peking University First Hospital, #8 Xishiku Street, Beijing 100034, People's Republic of China (E-mail: zhangzhichao@bjmu.edu.cn).

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pregnancy rates. In a series of 1,500 microsurgical varicocele repairs, 43% of couples were pregnant in the 1st year and 69% at 2 years when excluding couples with female-related fertility problems (5). A recent randomized controlled trial (RCT) supported the positive effect of varicocelectomy on male infertility (6). Moreover, recent meta-analyses found varicocelectomy associated with high postoperative spontaneous pregnancy rates in infertile men with clinically palpable varicoceles (7–9). Microsurgical varicocelectomy may be the best technique for increasing pregnancy rates and minimizing postoperative complications.

Male infertility microsurgery was introduced in China in 2004 (10). In the past 5 years, the use of microsurgical varicocelectomy has increased (11). However, data from Chinese infertile patients with varicoceles are scarce. In the present retrospective study, we aimed to investigate the outcome of microsurgical subinguinal varicocelectomy in Chinese infertile patients and identify possible preoperative factors that might affect the outcomes of varicocelectomy.

MATERIALS AND METHODS

Study Design

This was a retrospective case-control study to investigate spontaneous pregnancy rates after microsurgical subinguinal varicocelectomy and to analyze possible preoperative factors affecting the outcomes. Because pregnancy is the ultimate goal for infertile patients, we adopted spontaneous pregnancy rate as the primary outcome measure, with changes in semen parameters as a secondary outcome. The Institutional Review Board approved this study.

Patients

From January 2010 to December 2011, male patients with varicoceles underwent microsurgical subinguinal varicocelectomy in our center. Patients were examined in a warm room while standing, and the scrotum was inspected and palpated. All patients underwent Doppler ultrasonography of the scrotum. Varicoceles were clinically classified as: grade 1, palpable during the Valsalva maneuver; grade 2, palpable without the Valsalva maneuver; or grade 3, visible through the scrotal skin. We used Doppler ultrasonography of the scrotum to confirm the diagnosis and follow the postoperative effect. Each of the patients provided written informed consent to be in the study with guarantees of confidentiality.

Inclusion Criteria

We included married overall healthy men with infertility for >1 year of unprotected intercourse, clinically palpable varicoceles (grades 1–3), and impaired semen quality (at least one of the following semen characteristics: sperm concentration <20 million/mL or progressively motile sperm <50%).

Exclusion Criteria

We excluded patients with unilateral or bilateral subclinical or recurrent varicoceles, normal semen parameters, azoospermia, additional causes of infertility, significant

medical diseases, occupational heat exposure, associated female-factor infertility, or unstable marriage.

Female Partner

All of the women were ≤ 35 years old. All underwent evaluation by gynecologists and were reported to have normal fertility features.

Surgical Techniques

All patients underwent subinguinal microsurgical varicocelectomy with a surgical microscope (5, 12). A 3-cm subinguinal incision was made below the external ring. Camper and Scarpa fascia were divided by means of electrocautery. The testis was then delivered. External spermatic veins and gubernacular veins were ligated. The testis was then returned into the scrotum. The operating microscope (Leica M651) was then brought into the field. Under 6-power magnification, the external and internal spermatic fascia were opened. Then the magnification was increased to 10 or 16 power. All veins within the cord, with the exception of the vasal veins, were doubly ligated by passing two 5-0 silk ligatures beneath the vein. After the dissection, only the testicular arteries, cremasteric arteries, cremaster muscle fibers, nerves, lymphatic vessels, and vas deferens with its vessels remained. After adequate hemostasis was achieved, the cord was returned to its bed.

Preoperative Factors

The common preoperative factors of spontaneous pregnancy examined were age, infertile interval, grades of varicocele, side of varicocelectomy, sperm concentration, sperm forward motility, and FSH and T levels (13). Because of the high variability in sperm morphologic criteria in different hospitals, sperm morphology was not included in this study.

Follow-up

All patients were followed for ≥ 12 months after the day of surgery. Repeated semen analysis was performed every 3 months after varicocelectomy. Semen findings before and after varicocelectomy were evaluated according to the World Health Organization criteria (14). Any pregnancy that occurred was documented. The follow-up assessment was conducted by means of chart review and telephone calls. The gathered information included details regarding the patient history and physical examination, semen variables, and spontaneous pregnancy outcome.

Statistical Analysis

Spontaneous pregnancy was calculated from the date of surgery to the date of medically proven pregnancy. Patients who did not experience spontaneous pregnancy were censored at the date of last follow-up. Spontaneous pregnancy rate was estimated by means of the Kaplan-Meier method, and differences were determined by means of the log rank test. Univariate and multivariate analyses with Cox

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