

THE IMPACT OF LOUPE-ASSISTED INGUINAL VARICOCELECTOMY ON SEMEN QUALITY AND PREGNANCY RATE

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Abstract

Context. Open varicocelectomy is generally performed without microscopic equipment in Iran. We report our experience with loupe-assisted inguinal varicocelectomy, and its impact on semen parameters and pregnancy rate.

Subjects and Methods. We conducted a retrospective interventional study on secondary data obtained from the medical records of 303 men with varicoceles, who underwent an inguinal varicocelectomy between March 2003 and April 2012. The surgical technique involved the use of a 3.0 × loupe during spermatic cord dissection at the level of the internal inguinal ring under spinal anesthesia. Semen samples were analyzed for sperm concentration, motility, and sperm morphology before the varicocelectomy and after 3 months. All the infertile patients were followed-up postoperatively for more than 1 year.

Results. There were 9 (3.0%) varicocele recurrences and 3 (1.0%) hydroceles. After varicocelectomy, sperm concentration and motile spermatozoa increased. In addition, spermatozoa with normal morphology improved significantly postoperatively. Of the 303 subjects treated, 153 (83.2) had a 1-year preoperative history of infertility; the spontaneous pregnancy rate of the spouses during the follow-up period was reported to be 61.4%.

Conclusions. The results of this research indicated that varicocelectomy using loupe-assisted inguinal technique could improve semen parameters and pregnancy rate with a low postoperative complication rate.

Key words: Infertility, Pampiniform plexus veins, Varicocele, Semen.

most studies have supported the procedure for men with a clinical varicocele (4-6). It is suggested that varicocelectomy improves semen quality (7), and subsequent pregnancy rates in 34% of the spouses of treated men (8). Moreover, varicocelectomy is more cost effective than both intrauterine insemination and *in vitro* fertilization (9). In infertile men with azoospermia and a varicocele, intracytoplasmic sperm injection was reportedly useful after surgical repair of the varicocele (10). However, some complications reportedly associated with varicocelectomy include varicocele recurrence, hydrocele, and testicular artery injury (11). There are also many reports that discuss the role of varicocelectomy in pregnancy rates and semen quality in infertile men. However, the role of varicocele treatment in improvement of semen parameters and pregnancy rates is poorly understood. The clinical guidelines of the National Institute for Health and Clinical Excellence state that varicocelectomy should not be recommended for treatment of infertility. It is now known that the rate of varicoceles and their complication (infertility) are increasing among the Iranian population (12). Therefore, the present study of men in Babol, who underwent inguinal varicocelectomy using a loupe-assisted method during a 10-year period investigated semen parameters, pregnancy rates, and postoperative recurrence of varicoceles.

PATIENTS AND METHODS

INTRODUCTION

A varicocele is an abnormal dilation of the pampiniform plexus veins, with a frequency exceeding 35% in infertile men. Varicocelectomy is generally performed in infertile men with a varicocele (1-3). There is some controversy regarding varicocelectomy as a surgical treatment for male infertility, but

The research was approved by the ethics committee of the Medical Sciences University of Babol. A data sheet was compiled for the study after written consent was obtained from the patients. Data were collected retrospectively for 303 men with unilateral and bilateral varicoceles who underwent an inguinal varicocelectomy by a single surgeon (researcher)

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Table 1. Pre- and postoperative semen analysis (n = 297)

Varicocelectomy	Before Treatment Mean ± SD	3 months after treatment Mean ± SD	P
Sperm concentration, × 10 ⁶ /mL	30.2 ± 23.7	56.9 ± 31.1	0.0001
Sperm progressive motility, %	27.4 ± 17.4	53.3 ± 20.4	0.0001
Normal sperm morphology, %	25.4 ± 16.3	44.2 ± 17.6	0.0001

SD: standard deviation.

Table 2. Postoperative complications (n = 297)

Complication	N	%
Hydrocele	3	1.0
Recurrence	9	3.0
Atrophy	0	0.0

during a 10-year period from March 2003 to April 2012. Indications for varicocelectomy were testicular pain, infertility, or abnormalities in sperm parameters. The operational definition for varicocele was based on physical examination of the scrotum for visibly dilated and palpable veins. The subjects were examined in the supine and standing position in a warm room. In obese patients or men with a thick scrotum, scrotal ultrasonography was used for confirmation of a varicocele. Men with a clinical varicocele were divided among grade I (palpable with Valsalva maneuver only), grade II (palpable at rest), and grade III (readily visible). All the patients were followed-up postoperatively with a physical examination every 3 months for more than 1 year. Semen samples were obtained by masturbation, and examined for sperm concentration, motility, and normal sperm morphology before the varicocelectomy and after 3 months. Analysis based on World Health Organization guideline (WHO 1999) for each subject (13) was performed by specially trained laboratory workers.

Surgery was performed using a 3.0 × loupe during spermatic cord dissection at the level of the internal inguinal ring under spinal anesthesia.

The data sheet was used to gather information about age, marital status, high or low risk occupation, history of infertility, time until spontaneous pregnancy following varicocelectomy, pregnancy history, semen parameters before varicocelectomy, reported complications (including hydrocele, atrophy, and recurrence), and clinical grading of the varicocele. All analysis was performed using SPSS software (Statistical Package for the Social Sciences, version 16.0, SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to report baseline demographic data. For analysis, we used paired sample t-tests and the chi-square test.

RESULTS

The mean age of patients was 25.9 ± 4.8 years (range 15-41 years). About 50% of the men had a higher risk job. In comparing pre-operative and post-operative semen parameters, there was a significant increase in the sperm concentration and in the percentage of motile spermatozoa postoperatively (from 30.2 × 10⁶/mL to 56.9 ± 31.1 × 10⁶/mL and 27.4% to 53.3 % respectively, p = 0.0001), as well as the mean normal morphology improved from 25.4 % preoperatively to 44.2 % postoperatively (P= 0.0001) (Table 1).

These results indicate that varicocelectomy is associated with a significant improvement in sperm concentration, total motility, and morphology. No intraoperative complication was observed. There have been 9 (3.0%) varicocele recurrences and 3 (1.0%) hydroceles (Table 2).

Among 303 patients with varicoceles, 184 (60.7%) were married and 83.2% (153/184) were infertile, with a clinically palpable unilateral or bilateral varicocele. A total of 153 patients had a 1-year history of infertility; the pregnancy rate among spouses was reported 94 (61.4%) during the follow-up period.

DISCUSSION

Varicocelectomy is the most common surgery for treatment of male infertility (15). However, the relationship between varicocelectomy and infertility remains controversial (16), and there is a significant question regarding the effect of varicocelectomy on semen analysis and pregnancy rates. Studies have reported that varicocelectomy improves sperm concentration, motility, and morphology (4, 17, 18). In the present study, men who underwent varicocelectomy had an improvement in sperm concentration, total motility, and morphology similar to cited studies. However, a meta-analysis study showed that varicocele repair might not benefit male infertility (19), while, Ficarra *et al.* (2012) has shown varicocele repair was associated with a spontaneous pregnancy rate of 30% (20).

In this study over a 10-year period, we assessed men with a palpable lesion and abnormal semen quality parameters. The spontaneous pregnancy rate after inguinal varicocelectomy was about sixty percent. Notably, we found the spontaneous pregnancy rate after varicocelectomy was higher than in the other studies (21-24). In addition, the postoperative complication rate was very low (4.0%). Most of the patients (84.2%) underwent inguinal varicocelectomy for infertility and scrotal pain (15.8%).

One limitation of this study was that the subjects were selected from only one clinic, even though there are other clinics for varicocele treatment in Babol. However, management of all patients by a single surgeon yields valuable data. Another limitation was that not all information that can affect the pregnancy rate was available.

In conclusion, the present study showed that varicocelectomy using a loupe-assisted inguinal technique could improve sperm concentration, motility, and morphology, as well as the spontaneous pregnancy rate, with a low postoperative complication rate.

Conflict of interest

The authors declare that they have no conflict of interest.

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