

Paternity after microscopic inguinal surgery of varicocele in infertile males: A 5-years follow up

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Abstract

Objectives: Infertility affects about 15% of couples. One of the most common causes of male infertility is varicocele. In this study, the live birth rate after microscopic inguinal varicocelectomy and some related factors were studied in Northeast of Iran.

Design and patients: In this cross-sectional study, 976 infertile males who underwent microscopic inguinal varicocelectomy (2004-2009) in an academic hospital were studied and 264 were randomly selected. Female factors were ruled out. Data regarding age, varicocele grade and live birth rate were recruited and entered into SPSS-14 software; T-test and χ^2 were used to analyze the variables.

Results: The mean (\pm SD) age was 29.09 (\pm 4.80) years, 139 (52.7%) reported to have a successful result after a mean (\pm SD) duration of 21.74 (\pm 6.24) months. Unilateral varicocelectomy had significantly more positive results (58.8%) than bilateral (20.9%) but the relationship with grade was not significant. Primary type had 54.5% live birth v.s. 31.8% in secondary type (P-value<0.05). The mean duration between operation and live birth was significantly different in primary and secondary type (P-value<0.05).

Conclusions: Surgery of primary infertility could reveal to a higher live birth rate in a much shorter duration; also unilateral varicoceles are better responders to the surgery.

Key words: Varicocele, unilateral, infertility, live birth rate.

Introduction

Infertility is an important health issue which about 15% of couples in reproductive age should cope with it. Male factors are involved in about 40 to 50% of these cases. One of the most causes of male infertility is varicocele, which is defined as a

dilatation in pampiniform venous plexus surrounding the testis (1, 2). Upon world health organization (WHO) studies, varicocele is reported as a cause of infertility in 35-50% of primary infertility and 81% of secondary infertility (2, 3). Its prevalence is 8-20% in the general population (4). Also some studies indicate the familial trait of this disease so that clinical varicocele is more common in first degree relatives, particularly among brothers (3). It has been said that the spontaneous pregnancy rate after varicocele repair varies from 16% to 55.2% (2).

There are kinds of conflict in different studies regards the benefit of varicocele repair on reproductive outcome and chance of conception in infertile couples and variable pregnancy rate. Cayan et al reviewed and compared the results of similar studies about the succeed rate after various methods of repairing the varicocele between 1980-2008, and concluded a higher rate of spontaneous pregnancy and lower recurrence and complications after the microscopic surgery compared to the conventional techniques (2).

In this study, the live birth rate after microscopic inguinal varicocelectomy and the relationship with the degree of varicocele were studied in a 5-year follow-up in Northeast of Iran.

Patients and Methods

In this cross-sectional study, medical records of all patients (N=976) who underwent varicocelectomy by a urology specialist (2004-2009) in an academic hospital in Gorgan, Northeast of Iran were studied.

Patients were included from infertile couples whose the only cause of infertility after different exams was varicocele. Infertility in these patients was defined as "1 year of unwanted non-conception with unprotected intercourse in the fertile phase of the menstrual cycles" (5).

Patients who underwent inguinal microsurgical varicocelectomy after at least seven months from the surgery time were included. Spouses had been examined for polycystic ovary, hormonal tests, such as prolactin, thyroid function tests, FSH-LH, Salpyngography and laparoscopic evaluation to rule out female factors. Single patients and those who had other indications for varicocelectomy were excluded.

On the other hand, patients were classified into 2 groups: 1-primary infertility if he had no history of prior paternity, 2-secondary infertility if he had previously fathered a child with his current partner or a previous partner (6).

Testis and scrotal ultrasonography were done for all and varicocele grade was classified as followings: grade 1- palpable or visible only on Valsalva maneuver (straining); grade 2- palpable but not visible when standing upright at room temperature; and grade 3- visible when standing upright at room temperature (7). Spermograms were performed by computer assisted assay method twice. To increase the accuracy, all of these examinations were performed by a certain radiologist and laboratory.

Surgical procedure was microscopic inguinal varicocelectomy. All information related to age at the time of surgery, time of marriage and infertility duration, varicocele grade, ultrasound reports, physical examination results and spermatogram before and after the surgery were extracted.

Then patients were called and asked about the occurrence of pregnancy and live birth. Patient selection was randomly upon medical records code

and if patients were not accessible, another patient was replaced (N=264).

Data were entered into SPSS-14 software and T-tests and χ^2 were used to analyze the variables. P-value less than 0.05 was considered significant.

Results

The mean (\pm SD) age of patients was 29.09 (\pm 4.80) years. Among these 264 cases, 139 (52.7%) had reported a successful result and live birth occurred after a mean (\pm SD) duration of 21.74 (\pm 6.24) months (10-45 months).

Mean (\pm SD) age was not significantly different between patients who had positive results (ie; revealed to live birth after the surgery), and whom with negative results (ie; no fertility after varicocele repair) (28.40 \pm 4.06 years versus 29.86 \pm 5.42 years) (P-value>0.05).

Unilateral varicocelectomy had significantly more positive results (58.8%) than the bilateral surgery group (20.9%); live births occurred in people with unilateral varicocele 2.8-folds more than patients with bilateral varicocele (P-value<0.05).

As shown in table 2, outcome of the surgery had no significant relationship with varicocele grade. Positive surgery results were seen in 58.3% of patients with grade I, 50% of grade II and 54.2% of grade III (P-value>0.05).

Primary and secondary infertility was seen in 242 and 22 patients, respectively. The primary type had 54.5% live birth after varicocelectomy while it was 31.8% in secondary type (P-value<0.05).

Table 1. The frequency of live birth after inguinal varicocelectomy according to unilateral and bilateral involvement

Side \ Surgery Result	Positive		Negative		Total	
	No.	%	No.	%	No.	%
Unilateral	130	58.8	91	41.2	221	100
Bilateral	9	20.9	34	79.1	43	100
Total	139	52.7	125	47.3	264	100

Table 2. Live birth rate after varicocelectomy in different varicocele grades

Varicocele Grade \ Surgery Result	Positive		Negative		Total	
	No.	%	No.	%	No.	%
I	7	58.3	5	41.7	12	100
II	49	50	49	50	98	100
III	83	54.2	70	45.8	153	100
Total	139	52.7	125	47.3	264	100

Table 3. Live birth after varicocelectomy in primary and secondary infertility patients

Type of varicocele	Surgery Results		Positive		Negative		Total	
	No.	%	No.	%	No.	%	No.	%
Primary	132	54.5	110	45.5	242	100		
Secondary	7	31.8	15	68.2	22	100		
Total	139	52.7	125	47.3	264	100		

However, the mean duration between operation and time of live birth was 21 (± 6.13) months in primary and 28.28 (± 4.82) months in secondary type, this difference was statistically significant (P -value <0.05).

Patients' age was not significantly effective on the duration between operation and time of successful fertility (P -value >0.05).

Discussion

Present study showed 52.7% live birth after the microsurgical inguinal repair of varicocele in a population of infertile men, aged 29.09 (± 4.80) years.

In another study from North of Iran, pregnancy rate after inguinal microscopic surgery has been reported 36% which was lower than our study (8). This rate was 20.2-55% in different studies (2-5).

It could be explained by the different definition of success rate in various studies. We considered a "live birth rate" as the outcome and most of the others named it just as improved "semen quality" and "pregnancy rate" (2-5, 7-8). It means that we apply a more concise definition for the successful result of varicocele repair.

On the other hand, age of male patients and female factors like advanced age of female partner are among the related effective factors which are discussed in other papers (9), and could cause the different success rate.

Although, results of the present study showed that the mean age of patients with positive results were lower than patients who had negative results, but this difference was not statistically significant. Some studies showed the same results (10), others showed no significant improvement in spermograms of patients over 30 years-old after 1 year follow up (11).

But in this study, patients' age was not significantly effective on the duration between operation and time of successful fertility (P -value >0.05).

Unilateral varicocelectomy had significantly more positive results (58.8%) than the bilateral surgery group (20.9%) (P -value <0.05). This was not similar to most of the other studies. Scherr and Goldstein prospectively followed a total of 91 patients in USA, 65 bilateral and 26 unilateral left repairs. Bilateral varicocelectomy revealed significantly greater improvement in post-operative seminal parameters compared to the unilateral repair (12).

In another study in Canada, data of 369 consecutive varicocelectomies performed for male factor infertility showed a significantly greater improvement in sperm quality (motility) and male fertility potential in bilateral varicocelectomy (clinically palpable bilateral varicoceles) than unilateral one (13). In an Egyptian report, postoperative paternity was significantly higher in patients with bilateral varicocele (54.5%) diagnosed in ultrasonography of the testes (14).

Maybe this discrepancy is related to some or all of the following factors:

1. Sperm quality (motility) and seminal parameters are the main post-operative measurements in other studies, not the rate of live birth.
2. Clinical or ultrasonography diagnosis of varicocele could play a role in this differences.
3. The most important thing is that our sample size in the group of Bilateral varicocele ($N=9$) was very low and it couldn't be discussed accurately. Further studies with larger sample size are needed.

Present results showed that a successful result (live birth) occurred after 21.74 (± 6.24) months (range from 10- 45 months). Cayan et al in Turkey infertile males, showed an overall spontaneous pregnancy rate of 36.6% achieved after varicocelectomy with a mean time to conception of 7 months (range 1 to 19) (4). Maybe longer time is

needed to paternity and more patience should be offered to these patients.

Positive surgery results were seen in 58.3% of patients with grade I, 50% of grade II and 54.2% of grade III (P-value>0.05). Varicocele grade had no significant effect on the result of surgery. This result was similar to the other studies (15-16). Albeit cases with grade I were only 7 and not enough to be compared to other grades.

The primary type had 54.5% fertility rate and live birth after varicocelectomy while it was 31.8% in secondary type (P-value<0.05). However, the mean duration between operation and time of live birth was 21 (\pm 6.13) months in primary and 28.28 (\pm 4.82) months in secondary type, this difference was statistically significant (P-value<0.05).

Walsh et al (2009) reported that although in secondary type infertility, cases are older with older partners compared to primarily infertile men, but they have significantly better sperm concentrations with a history of fathering a child (6). This difference should be further evaluated in a prospective study.

Conclusions

According to the present results, primary infertility could be revealed to a higher live birth rate in a much shorter duration; also unilateral varicoceles are better responders to the surgery.

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