

Role of varicocelectomy in improving fertility in infertile male with varicocele

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Abstract

Introduction: Infertility is considered one of the major health problems. 40%–50% of infertility cases are associated with the male factor. There are several types of male infertility. From all types of male infertility, idiopathic infertility and varicocele are the major types. In general population, varicocele has an incidence of 4.4%-22.6%. The surgical treatment is varicocelectomy which can be performed through subinguinal, transinguinal, or suprainguinal incision. Varicocelectomy can be done either by open, laparoscopic, microscopic, or embolization unilaterally or bilaterally. The **aim** of the study is to assess effect of varicocelectomy in improving fertility in infertile male with varicocele. **Patients and methods:** The study was conducted between beginning of March to the end of October 2017. Twenty one (21), infertile male patients with varicocele were collected randomly. The diagnosis of varicocele was done clinically and by doppler ultrasonography. Clinical diagnosis was done by one surgeon and Doppler was conducted by one ultrasonographer. Seminal fluid analysis (SFA) and hormonal assay (Testosterone, FSH, LH and prolactin) were done for patient in initial diagnosis in the same laboratory using mini-vidas automated hormone analyzer. Scrotal subinguinal approach was used for performing varicocelectomy. Postoperatively, SFA was repeated monthly for assessment of patient improvement for 3 months. **Results:** 21 infertile men with varicocele included in this study and the mean of age of patients were 31.4 ± 9.7 years. Postoperatively, all parameters included in this study improved in a highly significant matter ($P < 0.001$). **Conclusion:** This study showed that varicocelectomy improves the fertility of infertile males with varicocele.

Key words: Kirkuk, male infertility, varicocele, subinguinal varicocelectomy, Seminal fluid analysis.

دور استئصال دوالي الخصية في تحسين الخصوبة لدى الذكور المصابين بالعقم مع دوالي الخصية

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الخلاصة

المقدمه: يعتبر العقم واحدة من القضايا الصحية العامة الرئيسية، ويشارك عامل الذكور في 40% - 50% من حالات العقم. النوع الأكثر شيوعاً من العقم عند الذكور هو العقم مجهول السبب، والذي يتميز بوجود واحد أو أكثر من المعلمات السائل المنوي غير طبيعية مع عدم وجود سبب محدد. وهناك سبب شائع آخر لعقم الذكور هو دوالي الخصية. في حين أن دوالي الخصية لديها نسبة 4.4% - 22.6% في عموم السكان، 21% - 41% من الرجال الذين يعانون من العقم الأولي و 75% - 81% من أولئك الذين يعانون من العقم الثانوي لديهم هذه الحالة. العلاج الجراحي هو استئصال الدوالي الذي ينطوي على ربط الأوردة الخصية. ويمكن الحصول على الوصول إلى الأوردة من خلال شق تحت المنطقة الاربية، أو من خلال المنطقة الاربية، أو من فوقها. ويمكن إجراء هذه العملية عن طريق الفتح، أو بالمنظار، أو بالميكروسكوب، أو الانصمام من جانب واحد أو الجانبين. والهدف من هذه الدراسة هو تقييم تأثير استئصال دوالي الخصية في تحسين الخصوبة في الذكور العقم مع دوالي الخصية. المرضى وطريقة العمل: أجريت الدراسة بين بداية مارس حتى نهاية أكتوبر 2017. تم جمع 21 من المرضى الذكور العقم مع دوالي الخصية عشوائياً. تم تشخيص دوالي الخصية سريريا و دوبلر بالموجات فوق الصوتية. تم إجراء التشخيص السريري من قبل جراح واحد، وأجريت دوبلر من قبل طبيب واحد. تم تحليل السائل المنوي والفحص الهرموني (تستستيرون، FSH، و LH و برولاكتين) للمريض في التشخيص الأولي في نفس المختبر باستخدام جهاز ميني فيداس (محلل الهرمون الألي). تم استخدام نهج الصفن تحت المنطقة الاربية لاستئصال دوالي الخصية. بعد العمل الجراحي، تم تكرار سفا شهريا لتقييم تحسين المريض لمدة 3 أشهر. النتائج: متوسط أعمارهم كانت 31.4 + 9.7 سنوات. بعد العمل الجراحي، تحسنت جميع المعلمات المدرجة في هذه الدراسة في مسألة ذات دلالة عالية. (P < 0.001) الاستنتاج: أظهرت هذه الدراسة أن فاريكوسلكتومي يحسن خصوبة الذكور العقم مع دوالي الخصية.

الكلمات المفتاحية: عقم الرجال، كركوك، دوالي الخصية، ازالة الدوالي، تحليل الحيامن.

Introduction

Infertility is considered one of the major health problems⁽¹⁾. 40%–50% of infertility cases are associated with the male

factor⁽²⁾. There are several types of male infertility. From all types of male infertility, idiopathic infertility and varicocele are the major types. In idiopathic infertility, all parameters of seminal fluid are normal

except one or two parameters without any cause identified⁽³⁾. In cases of varicocele, dilatation of testicular veins will be found with or without abnormal parameters of seminal fluid^(4,5). In general population, varicocele has an incidence of 4.4%-22.6% and this increases in males with primary (21%–41%) and secondary infertility (75%–81%)^(3,4,5). The surgical treatment is varicocelectomy (involves ligation of testicular veins) which can be performed through subinguinal, transinguinal, or suprainguinal incision. Varicocelectomy can be done either by open, laparoscopic, microscopic, or embolization unilaterally or bilaterally⁽⁶⁾. Earlier studies indicated a remarkable improvement in fertility profile after the use of varicocelectomy for the treatment of varicocele induced infertility. In addition, clinical trials concerning treatment effectiveness show conflicting results and varicocelectomy has been criticized especially under the light of evidence-based medicine (EBM)⁽⁷⁾. The introduction of intracytoplasmic sperm injection (ICSI) as an effective method of assisted reproduction in cases of male infertility has questioned the methods used until now⁽⁸⁾. Therefore, varicocele still remains one of the most controversial issues and further studies about effects of varicocelectomy on fertility are required^(7,8,9).

The aim of the study is to assess effect of varicocelectomy in improving semen parameters in infertile male with varicocele in Kirkuk.

Patients and methods

This study was conducted at the beginning of March to the end of October 2017. 21 infertile male patients with varicocele were collected randomly. The diagnosis of varicocele was done clinically and by doppler ultrasonography. Clinical diagnosis was done by one surgeon and Doppler was conducted by one ultrasonographer. Seminal fluid analysis (SFA) and hormonal assay (Testosterone, FSH, LH and prolactin) were done for patient in initial diagnosis in the same laboratory using mini-vidas automated hormone analyzer,⁽³⁾.

Scrotal subinguinal approach was used for performing varicocelectomy⁽¹⁰⁾. By using general or spinal anaesthesia, a transverse scrotal incision of 3-5 cm done. Covering fascias of the testes are incised in the same line of scrotal incision. Haemostasis should be secured. The affected testis should be delivered from the wound⁽¹¹⁾. Prophylactic Jaboulay's procedure should be performed to prevent postoperative hydrocele⁽¹²⁾. Then the spermatic cord above the testis should be examined well and then the covering internal and external spermatic fascias should be incised along the blood vessels. Contents of the cord should be examined well. Vas deferens and its vessels, cremasteric fibers and external spermatic vessels should be isolated and protected. Fine pulsations will usually point and reveal the location of the underlying internal spermatic artery (or arteries). Once located and identified, the artery is dissected and

freed from all surrounding veins. Care is taken to identify a number of lymphatic's (usually 2–5 channels). Then all internal spermatic veins are clamped with 2 artery forceps and in between excision of a segment of these vessels done. Both ends are ligated with Silk or Vicryl and approximated to each other. After securing hemostasis, the wound is closed in layers^(13,14,15).

Postoperatively, semen fluid analysis (SFA) was repeated monthly for assessment of patient improvement for 3 months. In this study, we measured the following parameters in SFA: sperm count, sperm concentration, normal sperm percentage and total motile sperm percentage. Normal values of these parameters have been obtained from WHO laboratory manual for the examination and processing of human semen⁽¹⁶⁾.

Comparison between means of variables done by using paired t test.

Results:

Twenty one patients with male infertile were studied. The mean and standard deviation of their ages were 31.4 ± 9.7 years. The study showed that sperm count improved significantly postoperatively, especially after 3 months of operation (Table 1).

Moreover, sperm count and normal sperm percentage improved gradually but significantly after operation, (Table 1). Also, the total motile sperm percentage

improved rapidly, dramatically and significantly postoperatively, (Table 1).

Discussion:

The present study showed that all parameters of seminal fluid analysis in infertile males with varicocele studied were improved postoperatively, either gradually or rapidly. The best results have been seen 3 months postoperatively.

Al-Huwaizi A., *et al.* concluded that there is an improvement of sperm parameters, the oxidant-antioxidant status and chromatin maturity percent following varicocelectomy⁽¹⁷⁾. Hammadi I., *et al.* mentioned that criteria of seminal fluid improved significantly in cases of clinical varicocele while in cases of subclinical varicocele, significant improvement seen in patients with low sperm count only⁽¹⁸⁾. Reddy S., *et al.* described that sperm motility, concentration, and testicular volume were improved after performing varicocelectomy⁽¹⁹⁾.

Vincenzo F., *et al.* mentioned that the criteria of seminal fluid significantly improves following varicocele repair⁽²⁰⁾.

Baazeem A., *et al.* mentioned that repair of varicocele will result in improvement of sperm count, motility (Both total and progressive motility) and ultramorphology. Also there will reduction of sperm DNA damage and seminal oxidative stress⁽²¹⁾.

Abdel-Meguid T., *et al.* concluded that varicocelectomy is superior to observation in infertile men with palpable varicocele and impaired semen quality⁽²²⁾. Also, Seo J., *et al.* described that varicocelectomy improves significantly both criteria of seminal fluid and chances of spontaneous pregnancy⁽²³⁾.

On other side, Cakiroglu B., *et al.* concluded that varicocelectomy may not cause statistically significant improvement in sperm morphology in cases of preoperative normospermia and teratozoospermia⁽²⁴⁾. Pena M., *et al.* concluded also, that varicocelectomy did not cause improvement in sperm parameters in general population⁽²⁵⁾. Okeke L., *et al.* concluded that patients with preoperative oligospermia will get benefit from repair of varicocele⁽²⁶⁾.

The present study conclude; that varicocelectomy did not cause improvement in sperm parameters in general population.

While the present study **recommend** that varicocelectomy should be done for all infertile males with varicocele. Also, the present study recommend that surgeons use scrotal subinguinal approach with prophylactic jableys procedure because of better results, less incidence of postoperative complications and better postoperative recovery of patients.

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Table (1) The mean and standard deviation of semen parameters preoperatively and postoperatively

Time of estimation Parameter (Mean ± SD)	Preoperatively	1 month postoperatively	2 months postoperatively	3 months postoperatively	P- value
Sperm count (million)	49 ± 21.1	52.9±20.9	56.9± 21.4	63.8±20	<0.001
Sperm concentration (million/ml)	14 ± 4.4	15.8±4.5	17±5.3	18.7±5.8	<0.001
Normal sperm percentage (%)	51.4 ±14.1	59.2±13.8	65.3±12	71.9±10.4	<0.001
Total motile sperm percentage (%)	41.4±13	51.1±12.3	58.5±13.5	70.7±13.2	<0.001