

Varikoselektominin sperm kalitesi ve doğurganlığa etkisi: 240 hastanın retrospektif incelemesi

The effect of varicocelelectomy on sperm quality and fertility: a retrospective analysis of 240 patients

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Özet

Amaç: İnfertil erkeklerde varikoselin cerrahi olarak düzeltilmesinden sonraki geç dönemde spermiogram değerlerine ve fertiliteye katkısını belirlemek için hastalar retrospektif olarak araştırıldı.

Gereç ve yöntem: Çalışmamızda Ocak 2004-Haziran 2012 yılları arasında Kars Devlet Hastanesi ve Kars Kafkas Üniversitesi Tıp Fakültesi'nde infertilite nedeniyle ameliyat yöntemine bakılmaksızın varikoselektomi yapılan ve kayıtlarına ulaşılan 240 hasta retrospektif olarak tarandı. Spermiogram ve doppler USG incelemesi olan ve tıbbi kayıtlarına ulaşılan 148 hasta çalışmaya dahil edildi. 46 hastanın medikal kayıtlarına ulaşılamadı, onlar da telefonla aranarak fertilizasyon durumları soruldu ve yeni bir semen analizi yaptırmak üzere kliniğimize davet edildi. Varikoselektomi yapıp eşi gebe kalan ancak düşükle sonlanan çiftler fertil olarak kabul edildi.

Bulgular: Hastaların ameliyat yaşları 19-38 arasında olup, yaş ortalamaları 29.3 olarak hesaplandı. Preoperatif semen analizinde, hastaların %70.6' sında (n:131) oligospermi, %22.4' ünde (n:43) oligoastenopermi ve %7' sinde (n:14) oligoastenoteratozoospermi mevcuttu. Hastaların 125' inin (%64.7) postoperatif spermiogram tetkiklerinde, WHO kriterlerine göre sperm konsantrasyonu, motilitesi veya morfolojisinin en az birinde artış saptandı. 80 çiftte (%41.1) varikoselektomi sonrasında ek bir tedavi ve yardımcı üreme tekniği kullanılmadan gebelik gerçekleştiği öğrenildi.

Sonuç: Biz çalışmamızda, infertil hastaların sperm parametrelerinde ve spontan gebelik oranında artış saptadık. Varikoseli olan infertil hastalara varikoselektomiyi tavsiye etmekteyiz.

Anahtar kelimeler: varikosel, cerrahi işlemler, infertilite

Türkçe kısa makale başlığı: Varikoselektominin sperm kalitesi ve doğurganlığa etkisi

Abstract

Introduction: In our study, we retrospectively analysed the effect of surgical varicocele repair on sperm analysis and fertility status of infertile patients in the late period.

Materials and methods: We retrospectively searched the records of 240 patients who underwent surgical varicocele repair between January 2004 and June 2012 in Kars State Hospital and Kafkas University Faculty of Medicine. 148 patients with obtained full medical records, sperm analysis and doppler ultrasonography were included in the study. We could not reach the postoperative data of 46 patients and they were asked current status of fertility on the phone and invited to our department for new semen analysis. Couples whose pregnancies resulted with abortions after varicocele repair were accepted as fertile.

Results: The mean age of the patients was 29.3 years ranging between 19 and 38 years old. Preoperative sperm analysis showed oligospermia, oligoasthenospermia and oligoasthenoteratozoospermia in 70.6%, 22.4% and 7% of cases, respectively. Postoperative semen analysis revealed improvements in at least one of sperm concentration, motility and morphology in 125 patients according to the WHO criteria and 80 of couples had spontaneous fertilization after varicocelelectomy without any requirement of assisted reproductive techniques.

Conclusion: Our study showed increase in parameters of semen analyses and spontaneous pregnancies in patients after varicocelelectomy. We advise varicocelelectomy to the infertile cases with varicoceles.

Key words: varicocele, surgical procedures, infertility

İngilizce kısa makale başlığı: The effect of varicocelelectomy on sperm quality and fertility

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Introduction

Varicocele can be defined as tortuosity, dilation and varicosity of the pampiniform plexus, caused by retrograde blood flow via the internal spermatic vein (1). It is the most commonly observed and correctable cause of the male factor infertility (2). The incidence of varicocele is approximately 15% and 1/3 of the infertile males are affected from this pathology (3).

There is a big dilemma in urology about whether varicocelectomy improves fertility or sperm quality. The Cochrane database revealed that varicocelectomy carried no benefit on a couple's chance of conception, when compared with control groups (4). The lack of this study was including the men with subclinic varicoceles or normal semen analysis. On the other hand, many studies dealing with varicocelectomy of infertile men with palpable varicoceles suggested that repair of the varicocele had a beneficial effect on fertility status (5,6).

Varicocelectomy options in infertile men might be open surgical, laparoscopic and radiologic approaches (7). To date, there have been no randomized, controlled prospective studies that revealed the superiority of one technique on another for the treatment of varicocele in infertile men.

In our study, we retrospectively analysed the effect of surgical varicocele repair on sperm analysis and fertility status of infertile patients in the late period.

Materials and methods

We retrospectively searched the records of 240 patients who underwent surgical varicocele repair between January 2004 and June 2012 in Kars State Hospital and Urology Department of Kafkas University Faculty of Medicine. One hundred forty-eight patients with obtained full medical records, sperm analysis and doppler ultrasonography were included in the study. We could not reach the postoperative data of 46 patients and they were asked current status of fertility on the phone and invited to our department for new semen analysis. They were also included in the study. The other 46 patients who were asked for a new semen analysis on the phone, but did not accept and/or having no postoperative semen analysis and/or having an infertile wife with or without medical support were excluded from the study. Couples whose pregnancies resulted with abortions after varicocele repair were accepted as fertile and successful.

Most of the complaints of the patients were scrotal swelling and pain. Clinical and laboratory tests were performed in all of the cases before surgery, including objective examination of the genitals. We classified varicocele on physical examination according to the Dubin and Amelar grading system (8).

After physical examination, doppler ultrasonography was performed. The doppler ultrasonography of the patients prior to the operation was performed by using PowerVision 6000 ultrasonography (Toshiba Inc., Tokyo, Japan) 7.5 MHz linear duplex probe with valsalva maneuver and spontaneous respiration. Presence and duration of the reverse blood flow were calculated and they were diagnosed as varicocele.

Semen samples were collected by masturbation after 4 days of abstinence and examined in the urologic laboratory of Kars State Hospital and Kafkas University Faculty of Medicine. The semen analysis was evaluated in terms of semen volume, sperm concentration, motility and morphology. Basic requirements for semen analysis was standardized according to the World Health Organization (WHO) guidelines.

Routine endocrinologic tests were performed in all patients prior to surgery for excluding any hormonal disorders. All of the cases had normal values of follicle-stimulating hormone, luteinizing hormone, prolactin and testosterone.

The indications of varicocelectomy were varicocele causing deterioration of sperm parameters. No patients had history of previous scrotal, inguinal or pelvic surgery.

Surgical Technique

All the patients were operated by 2 surgeons (K.C and R.K) under general or spinal anesthesia without using microscope. The procedures started with a low inguinal incision just above the external ring. The spermatic cord was dissected from the surrounding tissue and suspended in all cases. Dilated and tortuous veins were identified and ligated by a 4/0 vicryl suture.

Results

In this study, we could only evaluate the outcomes of 194 patients with doppler ultrasonography and semen analysis performed at the preoperative and postoperative period. The mean age of the patients was 29.3 years ranging between 19 and 38 years old.

Physical examination revealed grade 3 varicocele in 64 patients, grade 2 varicocele in 88 and grade 1 in 42. Preoperative sperm analysis showed oligospermia, oligoasthenospermia and oligoasthenoteratozoospermia in 70.6% (n:137), 22.4% (n:43) and 7% (n:14) of cases, respectively. Postoperative semen analysis revealed improvements in at least one of sperm concentration, motility and morphology parameters in 125 (64.7%) patients according to the WHO criteria and 80 (41.1%) of couples had spontaneous fertilization after varicocelectomy without any requirement of assisted reproductive techniques.

We performed bilateral varicocelectomy in 23 patients (11.7%) and left varicocelectomy in 171. The mean duration of operation time was 42 minutes and mean number of ligated veins was 4.2. External spermatic vein was observed in 79 cases (40%) and it was also ligated. The patients were routinely hospitalized for 1 day and discharged the day after the operation. The reason of hospitalization instead of an outpatient basis was general or spinal anesthesia which required close follow up of patients in the postoperative period.

No intra or postoperative complications like hydrocele, hemorrhage, wound infection, testicular hematoma or testicular atrophy were observed.

Discussion

Varicocele is the most frequent correctable pathology observed in infertile men who were admitted to the infertility clinics. The incidence of varicocele is approximately 15% and 1/3 of the infertile males are affected from this pathology. There are 3 types of varicocele according to the physical examination signs (8). Dubin and Amelar system is the most popular classification system used for grading varicocele. According to this classification, grade 1 varicocele can only be diagnosed by palpating the scrotal veins with Valsalva maneuver. Patients with palpable scrotal veins during the rest without the need of Valsalva maneuver are diagnosed as grade 2 varicocele. If the tortuous, dilated scrotal veins can be observed at physical examination without palpation, these patients are diagnosed as grade 3 varicocele (8). In our study, physical examination revealed grade 3 varicocele in 64 patients, grade 2 varicocele in 88 and grade 1 in 42. In the literature, there are some meta analyses suggesting that surgical correction of varicocele can improve spontaneous pregnancy

rates in infertile men with low semen parameters (5-6). In a meta-analysis, dealing with the outcomes of microsurgical varicocelectomy and high ligation series for varicocele treatment in infertile men, it was demonstrated that semen parameters were significantly improved in infertile men with palpable varicocele and abnormal semen analysis (9). In our study, postoperative semen analysis revealed improvements in at least one of sperm concentration, motility and morphology parameters in 125 (64.7%) patients according to the WHO criteria and 80 (41.1%) of couples had spontaneous pregnancies after varicocelectomy without any requirement of assisted reproductive techniques. We think that spontaneous pregnancy is the best indicator of assessing fertility status.

Varicocelectomy options in infertile men might be open surgical, laparoscopic and radiologic approaches (7). To date, there have been no randomized, controlled prospective studies that revealed the superiority of one technique on another for the treatment of varicocele in infertile men. A recent meta-analysis aimed to address the best treatment alternative of clinical palpable varicocele in infertile men (7). They analyzed 36 studies reporting postoperative spontaneous pregnancy rates and complications in infertile men with palpable varicoceles. They concluded that open microsurgical inguinal or subinguinal varicocelectomy might result with higher spontaneous pregnancy rates and fewer recurrences and postoperative complications when compared with other treatment modalities in infertile men. In our study, all the procedures were performed with naked eye without using microscope. Our aim was only to assess the outcomes of surgical varicocelectomy without comparing the surgical techniques in terms of semen parameters and spontaneous pregnancies.

Sclerotherapy or radiologic embolization of spermatic veins is an alternative repair method of varicocele. It is accepted as a minimal invasive method with less pain in infertile men with varicocele. The main disadvantages of this modality are interventional failure with a rate of 27%, sufficient skill and experience requirement and exposure to radiation (3). The overall complication rate of sclerotherapy is approximately 11% (10). The complications of this procedure are balloon migration, vascular perforation, allergy to contrast material, extravasation and thrombosis of the pampiniform plexus. This approach can also be

preferred for patients with failed varicocelectomy after surgical repair (11). We could not perform this technique in infertile patients with varicocele due to lack of this technology.

Open surgical approaches of varicocelectomy include high retroperitoneal, inguinal or subinguinal approaches. The high retroperitoneal technique known as Palomo depends on the ligation of the internal spermatic vein within the retroperitoneum before it exists in the inguinal channel (3). The major advantage of this technique is ligation of reduced number of veins at this level, which can minimize the risk of recurrence. On the other hand, by using this technique, a surgeon can not check the presence of an external spermatic vein which can also cause recurrence of varicocele (12). This modality can be an alternative to patients with previous inguinal surgery.

Inguinal (Ivanissevich) or subinguinal approaches can both be preferred for varicocele repair. The advantages of these techniques are ligation of internal and external spermatic veins at the same session. By using magnification, lymphatics and testicular artery can be protected easily (13). In our institution, we prefer to use inguinal or subinguinal approaches for the treatment of varicocele.

Microscopic varicocelectomy is another treatment modality of varicocele. It can be performed via inguinal or subinguinal approaches. When compared with inguinal approach, subinguinal approach does not require the incision of aponeurosis of the external oblique; but surgeon faces with higher number of spermatic veins. The disadvantages of this technique are requirement of more skill and damage of arterial supply, if the incision site is near to the level of the external inguinal ring (14).

Laparoscopic varicocelectomy is the last treatment modality of varicocele treatment. This technique carries the advantages of higher magnification and low incidence of hydrocele formation. The major disadvantages of this modality are chance of missing the external spermatic vein, longer learning curve, more invasiveness than open approaches and requirement of general anesthesia. There is also a risk of intestinal and major vascular injury during needle or trocar insertion. Enquist et al. reported major complication rate of 7.6% with laparoscopic varicocelectomy (15).

The complications after varicocele may vary from hydrocele formation to testicular atrophy. The complications depend on the type of surgery performed. Hydrocele is the most common

complication with the incidence of ranging 0% to 10% in infertile men (7). According to the meta analysis of Cayan et al. (7), the lowest hydrocele formation was observed in microsurgical series with an overall rate of 0.44%. This rate was 8.28% in the Palomo technique, 2.84% in the laparoscopic varicocelectomy series and 7.3% in the macroscopic inguinal or subinguinal series. Same group also analysed the recurrence rates according to the surgery techniques. They reported the recurrence rates of Palomo, microsurgical varicocelectomy, laparoscopic varicocelectomy, radiologic embolization and macroscopic inguinal or subinguinal approach as 14.97%, 1.05%, 4.3%, 12.7% and 2.63%, respectively. In our study, we did not observe any complication or recurrence at the postoperative period. This may attribute to the small number of treated patients in our study and lack of standardized follow up period.

Varicocelectomy in infertile men with varicocele improves the semen parameters and fertilization status of the couples. Spontaneous pregnancies are reported to be high after treatment of the infertile men with varicocele. Our study also shows increase in parameters of semen analyses and spontaneous pregnancies in patients after varicocelectomy. We advise varicocelectomy to the infertile cases with varicoceles. The best treatment modality is a dilemma in urology and for finding the correct answer of this question, further prospective randomized studies are required which involve large patient population.

References

1. Zucchi A, Mearini L, Mearini E, et al. Treatment of varicocele: Randomized prospective study on open surgery versus Tauber antegrade sclerotherapy. *J Androl* 2005; 26:328-32.
2. Schlesinger MH, Wilets IF, Nagler HM. Treatment outcome after varicocelectomy. A critical analysis. *Urol Clin N Am* 1994; 21:517-29.
3. Nagler HM, Luntz RK, Martinis FG. Varicocele. In: Lipshultz LI, Howards SS, eds. *Infertility in the male*. 3rd ed. St. Louis, Missouri: Mosby-Year Book; 1997:336-59.
4. Evers JL, Collins JA. Surgery or embolisation for varicocele in subfertile men. *Cochrane Database Syst Rev* 2004; CD000479.
5. Ficarra V, Cerruto MA, Ligouri G, et al. Treatment of varicocele in subfertile men: the Cochrane review-a contrary opinion. *Eur Urol* 2006; 49:258-63.
6. Marmar JL, Agarwal A, Prabakaran S, et al. Reassessing the value of varicocelectomy as treatment for male

- subfertility with a new meta-analysis. *Fertil Steril* 2007; 88:639-48.
- 7.Cayan S, Shavakhabov S, Kadioglu A. Treatment of palpable varicocele in infertile men: A meta-analysis to define the best technique. *J Androl* 2009; 30:33-40.
- 8.Dubin L, Amelar R. Varicocele size and results of varicocelectomy in selected subfertile men with varicocele. *Fertil Steril* 1970; 21:606-09.
- 9.Agarwal A, Deepinder F, Cocuzza M, et al. Efficacy of varicocelectomy in improving semen parameters: new meta-analytic approach. *Urology* 2007; 70:532-38.
- 10.Pryor JL, Howards SS. Varicocele. *Urol Clin N Am* 1987; 14:499-513.
- 11.Sharlip ID, Jarow JP, Belker AM, et al. Best practice policies for male infertility. *Fertil Steril* 2002; 77:873-82.
- 12.Murray RR, Mitchell SE, Kadir S, et al. Comparison of recurrent varicocele anatomy following surgery and percutaneous balloon occlusion. *J Urol* 1986; 135:286-89.
- 13.Raman JD, Goldstein M. Intraoperative characterization of arterial vasculature in spermatic cord. *Urology* 2004; 64:561-64.
- 14.Hopps CV, Lemer ML, Schlegel PN, et al. Intraoperative varicocele anatomy: a microscopic study of the inguinal versus subinguinal approach. *J Urol* 2003; 170:2366-70.
- 15.Enquist E, Stein BS, Sigman M. Laparoscopic versus subinguinal varicocelectomy: a comparative study. *Fertil Steril* 1994; 61:1092-96.