

Results of Varicocelectomy in the Management of Male Infertility

SISSOKO Idrissa^{1*}, KASSOGUE Amadou¹, DIALLO Moussa Salif¹, SANGARE Daouda¹, DIAKITE Adama Salifou², BOUARE Alassane¹, ONGOIBA Souleymane³, KONE Ousmane⁴, BAGAYOGO Tidiani Kariba⁵, BERTHE Amadou⁶, BERTHE Honoré JG⁷, DIAKITE Mamadou Lamine⁷

¹Urology Department, Kati University Hospital- MALI

²Urology Department, Kayes Regional Hospital- MALI

³Urology Department, Mali-Gavardo Hospital- MALI

⁴Urology Department, Markala Regional Hospital- MALI

⁵Urology Department, CHME Le Luxembourg- MALI

⁶Urology Department, CSREF Commune I- MALI

⁷Urology Department, Point G University Hospital- MALI

DOI: [10.36347/sjmcr.2022.v10i09.010](https://doi.org/10.36347/sjmcr.2022.v10i09.010)

| Received: 02.08.2022 | Accepted: 06.09.2022 | Published: 15.09.2022

*Corresponding author: Dr. SISSOKO Idrissa

Urology Department, Kati University Hospital- MALI

Abstract

Original Research Article

Male infertility remains a public health problem today. Varicocele looms large and is significantly associated with impaired sperm quality. Varicocele being defined as an abnormal and/or tortuous dilation of the scrotal veins of the pampiniform plexus. **Method:** This was a descriptive cross-sectional study with retrospective during 24 months. Our inclusion criteria were all patients operated on for varicocele on grounds of infertility or spermogram abnormality in the department, varicocele patients not operated on, or operated on for varicocele for other causes and incomplete records were not included in our study. **Result:** The 25-40 age group was the most represented with 60%, The desire for procreation was the reason for consultation most encountered with 73.33% and this desire had been evolving for 5 to 10 years in 53.33% of cases. High blood pressure was the most common medical history at 26.7%. Inguinal hernia was the most common surgical history, 36.66%. The normal spermogram rate increased from 13.33% before the intervention to 56.66% at 12 months postoperatively and the pregnancy rate increased to 33.33% at 12 months. **Conclusion:** Varicocele is a frequent pathology, Surgical cure for varicocele also significantly improves the fertility parameters of sperm in infertile patients within 3 to 6 months after the operation.

Keywords: Varicocele- male infertility- azospermia.

Copyright © 2022 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

Couple infertility remains a public health problem today. Many publications have reported the existence of a decline in the quality of sperm in men over the past decades [1]. Varicocele looms large and is significantly associated with impaired sperm quality. Although the majority of men with varicocele are fertile, varicocele remains the most common clinical abnormality in infertile men [2].

Varicocele is defined as an abnormal and/or tortuous dilation of the scrotal veins of the pampiniform plexus [3]. It is found in 15% to 20% of the general male population, 35% of men with primary infertility, and more than 70% with secondary infertility. It is a classically unilateral left pathology [2, 4]. This

asymmetry could be explained by the fact that the pressure within the left renal vein where the left spermatic vein empties is higher than in the vena cava with also a longer path on the left. The varicocele is bilateral in 1.5% and right unilateral in 0.2%. In infertile men, it is left unilateral in 85 to 90% of cases [5].

The pathophysiological mechanisms that underlie the genesis of an alteration of spermatogenesis in relation to varicocele are imperfectly elucidated. Testicular hyperthermia, testicular hypoperfusion and increased oxidative stress caused by varicocele are all factors with a possible negative impact on testicular functioning [6, 7].

Citation: SISSOKO Idrissa, KASSOGUE Amadou, DIALLO Moussa Salif, SANGARE Daouda, DIAKITE Adama Salifou, BOUARE Alassane, ONGOIBA Souleymane, KONE Ousmane, BAGAYOGO Tidiani Kariba, BERTHE Amadou, BERTHE Honoré JG, DIAKITE Mamadou Lamine. Results of Varicocelectomy in the Management of Male Infertility. Sch J Med Case Rep, 2022 Sept 10(9): 898-902.

Among the various surgical techniques described to treat varicocele, microsurgical ligation by subinguinal or inguinal approach is gradually becoming the reference standard (low recurrence and complication rates). Alternative embolization and/or retrograde sclerotherapy have been validated in interventional imaging [3].

The vast majority of studies conclude with an improvement in sperm parameters after treatment. An improvement in concentration (average increase of 12 M/ml of spz) and motility of spermatozoa (average increase of 11%) and variable effects concerning spermatozoa morphology have been reported by a meta-analysis [2].

Most of these studies were carried out in different contexts, our study aims to assess the effectiveness of surgical treatment of varicocele in infertile men on the parameters of the spermogram in our context.

PATIENTS AND METHODS

This was a descriptive cross-sectional study with retrospective collection carried out in the urology department of the University Hospital Pr Sidy Sall of Kati during the period from June 1, 2019 to June 30, 2020, i.e. 24 months. We collected all patients hospitalized in the department during the study period for varicocele. Our inclusion criteria were all patients operated on for varicocele on grounds of infertility or spermogram abnormality in the department, varicocele patients not operated on, or operated on for varicocele for other causes and incomplete records were not included in our study.

All our patients were operated on within the framework of a short hospitalization of 24 hours, under spinal anesthesia and general anesthesia in two cases (laparoscopy). We made an inguinal incision next to the inguinal ring, identification and dissection of the spermatic cord, ligation – section of the dilated veins.

Patients were reviewed in postoperative consultation within a maximum of 6 weeks with clinical

examination for recurrence; ultrasound was performed only in case of complication. Clinical cure of varicocele was defined by the absence of impulsiveness of the pampiniform plexus to Valsalva efforts. The spermogram was performed at 3, 6, 9 months postoperatively.

The questionnaires were entered and analyzed on Word 2016, Excel 2016 and SPSS version 21.0 software after data verification.

RESULTS

We collected 707 cases of urological pathologies in the urology department of the CHU Pr Bocar Sidy SALL of Kati, including 30 cases of varicocele, i.e. a hospital frequency of 5.6% (table 1). The 25-40 age group was the most represented with 60% (table 2). All our patients were married with 36% polygamous.

The desire for procreation was the reason for consultation most encountered with 73.33% and this desire had been evolving for 5 to 10 years in 53.33% of cases. High blood pressure was the most common medical history at 26.7%. Inguinal hernia was the most common surgical history, 36.66%.

Varicocele is found on clinical examination in 93.33%. Grade II varicocele was the most common on ultrasound with 63.33% and testicular size was normal in 73.33%. It was bilateral in most cases in 76.66%.

The table (III, IV) gives the distribution of the patients according to the data of the spermogram Oligospermia was present in 40%. Varicocele was approached via the inguinal route in 93.33% of cases (table V).

The table (VI, VII) summarizes the evolution of the postoperative spermogram, thus the normal spermogram rate increased from 13.33% before the intervention to 56.66% at 12 months postoperatively and the pregnancy rate increased to 33.33% at 12 months.

Table I: distribution according to the frequency of varicocele compared to other surgical urological pathologies in the department

Pathology	Number	Percent (%)
BPH (benign prostate hyperplasia)	282	39,8
Urinary lithiasis	133	18,7
Obstructive renal failure	93	13,1
Bladder Tumor	56	07,8
Varicocele	30	05,6
Prostate cancer	26	03,6
Ureteral stricture	26	03,6
Hydrocele	17	02,3
Urethral stricture	12	01,5
Mute kidney	10	01,3

Pathology	Number	Percent (%)
Renal tumor	07	0,9
Pyelo uretral junction syndrom	06	0,7
Cryptorchidy	05	0,6
Fournier Gangrena	03	0,4
Priapism	01	0,1
Total	707	100

Table II: distribution of patients according to their age.

Age	N	%
25 – 40	18	60
41 – 50	08	26.66
50 and mores	4	13.33
Total	45	100,0

Table III: distribution of patients according to spermogram data

Spermogram	Number	%
Asthenospermia	8	26.66
Normal	4	13.33
Oligospermia	12	40
Azoospermia	5	16.66
Hyperspermia	1	3.33
Total	30	100,0

Table IV: distribution of patients according to spermogram data.

Spermocytogram	Number	%
Teratospermia	23	92
Normal	2	8
Total	25	100,0

Table V: distribution of patients according to type of surgery

Type de chirurgie	number	%
Inguinal abord	28	93.33
Laparoscopy	2	6.66
Total	30	100.0

Table VI: distribution of patients according to the evolution of the postoperative spermogram

Spermogram	0 month	3 months	6 months	9 months	12 months
Asthenospermia	8(26.66)	7(23.33)	4(13.33)	4(13.33)	5(16.66)
Normal	4(13.33)	5(16.66)	11(36.66)	15(50)	17(56.66)
Oligospermia	12(40)	12(40)	12(40)	8(26.66)	4(13.33)
Azoospermia	5(16.66)	5(16.66)	3(10)	3(10)	3(10)
Hyperspermia	1(3.33)	1(3.33)	0(0.00)	0(0)	1(3.33)
Total	30(100,0)	30	30	30	30

Table VII: distribution of patients according to the number of postoperative pregnancies

Pregnancy	0 month	3 months	6 months	9 months	12 months
miscarriages	2(6.66)	3(10)	3(10)	5(16.66)	5(16.66)
evolutive pregnancy	1(3.33)	1(3.33)	1(3.33)	4(13.33)	5(16.66)
No pregnancy	27(90)	26(86.66)	26(86.66)	21(70)	20(66.66)

COMMENTARY- DISCUSSION

Infertility is defined by the delay in conception after one year of unprotected intercourse within a couple. This period is even shortened to 6 months in the presence of an advanced age of the partner (>35 years) or a notion of surgical cure for cryptorchidism in men. Infertility affects 15% of couples [5, 8]. Male origin is present in 40% of cases [9]. Infertility can be attributed

to men when there is an alteration in one or more sperm parameters, namely the concentration spermatic and/or mobility and/or morphology in at least one of 2 semen samples taken 4 weeks a part [2].

The risk factors are multiple and vary between anatomical, hormonal, infectious and toxic causes.

Varicocele is a frequent pathology, reported in \pm 15% of the male population after puberty.

This incidence increases significantly in men suffering from primary (\pm 35%) and secondary (\pm 80%) infertility.

In our study, varicocele represented 5.6% of hospitalizations in the department during the study period, the age group of 25 to 40 years represented 60% of cases. Most of our patients (73.33%) consulted for desire for procreation (infertility), this desire evolved between 5 and 10 years in 53.33%. which shows the delay experienced by our patients before consulting, most often linked to the taboo that the problem of male infertility constitutes. Culturally, infertility is wrongly associated with the female sex, which motivates many men to marry several women or often motivated by parents, even before questioning themselves. Thus, 36% of our patients were polygamous before diagnosis and the reason for this polygamy was infertility in 100% of these patients.

The varicocele was clinical in 93.33%, it was grade II on ultrasound in 63.33% and bilateral in 76.66% and the testicular volume was normal in 73.33%, moreover we did not find an isolated right varicocele. In the study by Ouanes Y *et al.*, varicocele was bilateral in 63% of patients, and unlike our study, grade III was predominant with 51.8% and testicular hypotrophy was noted in 13.52% [12].

The spermogram interpreted according to reference values given by the World Health Organization (WHO) was disturbed in the majority of cases, thus the abnormalities of the spermogram were oligospermia in 40% and teratospermia in 92% of cases [10]. A. Kbirou *et al.*, in their studies found 74% spermogram abnormalities, including 33% oligospermia and 6% teratospermia [13].

Several theories have been suggested to explain the mechanism of alteration of the spermogram in the presence of varicocele, among which we cite the increase in temperature at the level of the testicles, local hypoxia by stagnation of venous blood poor in oxygen and the reflux of the toxic metabolites from the kidney or the adrenal [2].

The surgical cure of varicocele is a valid option for the management of infertile couples; this cure was performed by inguinal route in 93.33% of cases and laparoscopic in 6.66% of cases. Other therapeutic options have been used in other studies such as embolization by interventional radiology, sclerotherapy, which have produced good results [2].

The control spermogram at 3, 6, 9 and 12 months revealed an improvement in sperm parameters, thus the normal spermogram rate increased from

13.33% before the intervention, 16.66% at 3 months, 36.66% at 6 months and 56.66% at 12 months postoperatively. The number of miscarriages and ongoing pregnancy increased respectively from 10% and 3.33% at 3 months to 16.66% at 12 months.

A meta-analysis found in infertile men treated for a varicocele an improvement in the concentration (average increase of 12 M/ml of spz) and mobility of the spermatozoa (average increase of 11%) and variable effects concerning the morphology of the sperm [2]. According to the recommendations of the Andrology and Sexual Medicine Committee of the French Association of Urology, the delay before objectifying the effectiveness of the treatment is between 3 and 6 months, which correspond to at least one cycle of spermatogenesis.

Several studies have demonstrated an improvement in the pregnancy rate [2], such as that of Madgar I and Coll. which found a natural pregnancy rate of 60% in the treated group against 10% in the control group [2]. The patients in the control group then performed a varicocele cure and reached the natural conception rate of the treated group (66% with 44% in the first year and 22% in the second year).

CONCLUSION

Varicocele is a frequent pathology in our current practice; it is the first cause of male infertility found in our department. Surgical cure for varicocele also significantly improves the fertility parameters of sperm in infertile patients within 3 to 6 months after the operation.

REFERENCES

1. ODZEBE, AWS (2019). Sperm profile of a man with varicocele. *Annal of Health Sciences*, 18(2), 44-50.
2. Methorst, C., Akakpo, W., Graziana, JP, Ferretti, L., Yiou, R., Morel-Journel, N., ... & Huyghe, E. (2021). Recommendations of the Andrology and Sexual Medicine Committee of the AFU concerning the management of Varicocele. *Advances in Urology*, 31 (3), 119-130. <https://doi.org/10.1016/j.purol.2020.11.006>
3. Bonnet, Q., Coppens, L., Delvigne, A., & Waltregny, D. (2020). Impact of antegrade sclerotherapy of clinical left varicocele on the spermogram. *Advances in Urology*, 30 (5), 281-287. <https://doi.org/10.1016/j.purol.2020.02.010>
4. Maheshwari, A., Muneer, A., Lucky, M., Mathur, R., McEleny, K., & British Association of Urological Surgeons and the British Fertility Society. (2022). A review of varicocele treatment and fertility outcomes. *Human Fertility*, 25(2), 209-216. DOI://doi.org/10.1080/14647273.2020.1785117

5. Frikh, M., Benaissa, M., Kasouati, J., Benlahlou, Y., Chokairi, O., Barkiyou, M., ... & Elouennass, M. (2021). Prévalence de l'infertilité masculine dans un hôpital universitaire au Maroc. *The Pan African Medical Journal*, 38(46).
6. Lara-Cerrillo, S., Gual-Frau, J., Benet, J., Abad, C., Prats, J., Amengual, M. J., ... & García-Peiró, A. (2022). Microsurgical varicocelectomy effect on sperm telomere length, DNA fragmentation and seminal parameters. *Human fertility*, 25(1), 135-141. DOI: 10.1080/14647273.2019.1711204
7. Afshar, K., & Domes, T. (2018). Varicocele. *Canadian Urological Association Journal*, 12(4 Suppl 1), S34-6. <http://dx.doi.org/10.5489/cuaj.5231>
8. BOLANGA, RB (2020). DETERMINING PARAMETERS OF THE SPERMOGRAM AFTER A VARICOCELECTOMY. *African Journal of Urology and Andrology*, 2(2).
9. Kandevani, N. Y., Namdari, F., Hamidi, M., Dialameh, H., & Behzadi, A. (2022). Developing a novel prediction model for the impact of varicocelectomy on postoperative fertility. *European Journal of Translational Myology*. 32(2), 10411. doi: 10.4081/ejtm.2022.10411
10. Bagayogo, NA, Sine, B., Thiam, A., Diaw, M., Diao, B., Ndoeye, AK, & Bagayogo, NA (2021). Varicocele surgery under local anesthesia: technical aspects and feasibility. *Ann. Afr. Med* , 14 (3), e4250.
11. Zampieri, N., & Camoglio, F. S. (2018). Semen analysis in patients treated for varicocele in pediatric age: are surgical outcomes enough to preserve the fertility potential?. *American Journal of Clinical and Experimental Urology*, 6(3), 149-153.
12. Hassan, H. Y. (2019). Role of varicocelectomy in improving fertility in infertile male with varicocele. *Journal of Madenat Alelem University College*, 11(1), 19-26.
13. Ouanes, Y., Bibi, M., Chaker, K., AS, S. B. R., & Nouria, Y. (2021). Impact of bilateral varicocelectomy in infertile men. *Progres en Urologie: Journal de L'association Francaise D'urologie et de la Societe Francaise D'urologie*. <https://doi.org/10.1016/j.purol.2021.03.002>
14. Kbirou, A., Jandou, I., Adnane, E., Mohammed, E., Moataz, A., Mohammed, D., ... & Aboutaieb, R. (2022). Profil épidémiologique et clinique de l'infertilité masculine: étude observationnelle transversale descriptive et analytique. *Sexologies*, 31(2), 117-122. <https://doi.org/10.1016/j.sexol.2021.05.004>
15. Rocher, L., Balasa, C., Hindawi, G., Bresson, B., & Maxwell, F. (2020). How I do an ultrasound checkup for male infertility. *Journal of Diagnostic and Interventional Imaging* , 3 (1), 12-17.