


Varicocele and Spermogram Abnormality: About 264 Cases at the Fertilia Medical Clinic in Bamako

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Abstract

Aims: To determine the impact of varicocele on the result of the spermogram in a group of hypo-fertile or infertile men. **Patients and Method:** This was a cross-sectional, descriptive study concerning 264 men collected between February 2020 and March 2022 at the Fertilia medical clinic in Bamako. The study population consisted of consenting male subjects presenting for infertility. All of our patients had already done a spermogram, they then benefited from a scrotal Doppler ultrasound. The scrotal echo-doppler was completed by an abdominal and pelvic echography in search of a possible etiology, in particular a renal cancer, a thrombosis of the renal or spermatic vein, a retro-peritoneal mass or a nutcracker syndrome. Testicular volume was measured on ultrasound according to Lambert's formula (length × width × height × 0.71). A volume = 16 ml was considered normal. **Results:** 264 patients were recruited in ours. The average age was 33 years with extremes ranging from 25 to 65 years. 149 patients or 56.44% were between 30 and 45 years old. 213 patients or 80.68% had primary infertility. All the patients, *i.e.* 100%, had a sperm anomaly and dilation of the pampiniform plexus veins. The most common sperm abnormalities were oligoasthenoteratozoospermia, which concerned 214 patients, or 81%, followed by azoospermia (40 patients, or 15%) and oligospermia (10 patients, or 4%). 213 patients or 80.68% had a Hirshen grade II varicocele, 45 patients or 17% had grade I and 06 patients or 2.27% had grade III. Among the 6 patients, 04 had left testicular atrophy and 2 bilateral atrophy. The venous reflux was more accentuated on the left than

on the right. **Conclusion:** Varicocele is significantly found in men with infertility. Sperm alterations concern both the concentration of spermatozoa, their mobility and their vitality. Even if the mechanism of alteration of the sperm parameters is not well elucidated, our study made it possible to make the link between the dilation of the veins of the pampiniform plexus and the sperm abnormalities mentioned above. It should be recognized that varicocelectomy has allowed a significant improvement in the quality of sperm with the obtaining of a certain number of natural pregnancies and those resulting from medically assisted procreation.

Keywords

Ultrasound, Male Infertility, Varicocele, Oligoasthenoteratozoospermia

1. Introduction

According to the World Health Organization (WHO), infertility is defined as the absence of conception after at least 12 months of normal, regular, complete and unprotected sexual intercourse [1]. It affects around 180 million people worldwide and around one in six couples face primary or secondary infertility [1] [2]. The rate of infertility varies from one country to another, ranging from 5% to 8% in developed countries and from 5.8% to 44.2% in developing countries [3].

The woman has long been considered the main culprit of marital infertility. Many women remain marginalized, even repudiated because of this confusion linked to ignorance of the etiopathogenic data of marital infertility. For decades, advances in medicine in general and those in reproductive biology in particular and cutting-edge medical imaging techniques have established that the responsibility of the man in the couple's infertility is found in 20-30% of cases according to the French or North American epidemiological databases, respectively [4].

To evaluate male fertility and infertility, the spermogram proves to be a very good basic examination allowing diagnosis to be made, but also to guide the prescriber towards additional examinations. The treatment may call for a gesture on the genital apparatus (surgery) or medically assisted procreation [5].

In Africa, infertility affects 25% to 40% of the southern Saharan population [6].

In Mali, a study showed that the responsibility of the man in infertility varies from 30% to 50% [7].

2. Patients and Method

This was a cross-sectional, descriptive study concerning 264 men collected between February 2020 and March 2022 at the Fertilia medical clinic in Bamako. The study population consisted of consenting male subjects presenting for infertility. All of our patients had already done a spermogram, they then benefited from a scrotal Doppler ultrasound. Scrotal Doppler ultrasound was supple-

mented with abdominal and pelvic ultrasound to check for possible etiology, including renal cancer, renal or sperm vein thrombosis, retroperitoneal mass, or nutcracker syndrome.

2.1. Exploration Techniques

We used different types of ultrasound devices such as Voluson E8, Logic9 and Vivid 3. The ultrasound of the scrotal contents, carried out using a high frequency linear probe, involves the precise study of the topography, the volume and texture of the testicle, position, size and appearance of the epididymis and vas deferens [8]. Testicular Doppler ultrasound includes a color analysis of the vascular density and a spectral study of the intratesticular arterial signal [9]. The gradation of the varicocele is made according to the Hirshen scale which is as follows:

- 1) Reflux during the Valsalva maneuver and not in spontaneous breathing;
- 2) Intermittent in spontaneous breathing;
- 3) Continuous plateau in spontaneous breathing.

Spermograms were performed after three days of sexual abstinence and the samples were taken in the laboratory using the technique of masturbation or coitus interruptus.

2.2. Data Processing and Analysis

The data collected on the technical sheets were entered and analyzed using SPSS software. Spearman's and Pearson's correlation tests were used to determine the degree of significance during comparisons at the 5% level.

2.3. Ethical Consideration

Informed consent from patients was obtained. Anonymity and confidentiality of data were ensured through restricted access to data.

3. Results

264 patients were recruited in ours. The average age was 33 years with extremes ranging from 25 to 65 years. 149 patients or 56.44% were between 30 and 45 years old. 213 patients or 80.68% had primary infertility. All the patients, *i.e.* 100%, had a sperm anomaly and dilation of the pampiniform plexus veins. The most common sperm abnormalities were oligoasthenoteratozoospermia, which concerned 214 patients, or 81%, followed by azoospermia (40 patients, or 15%) and oligospermia (10 patients, or 4%) (**Table 1**).

Of the 264 patients, the varicocele concerned the left side in 64.77% of cases and was bilateral in 32.20% of cases (**Table 2**).

213 patients or 80.68% had a Hirshen grade II varicocele, 45 patients, or 17% had grade I and 06 patients or 2.27% had grade III (**Table 3**). Among the 6 patients, 04 had left testicular atrophy and 2 bilateral atrophy. The venous reflux was more accentuated on the left than on the right.

Table 1. Distribution of patients according to spermatic anomaly.

SPERM ABNORMALITY	n	PERCENTAGE (%)
OLIGOASTHENOTERATOZOOSPERMIA	214	81
AZOSPERMIA	40	15
OLIGOSPERMIA	10	04
TOTAL	264	100%

The relationship between varicocele and oligoasthenoteratozoospermia was significant ($p < 0.005$).

Table 2. Distribution of patients according to location of varicocele.

LOCALIZATION OF VARICOCELE	n	PERCENTAGE (%)
RIGHT VARICOCELE	8	03.03
LEFT VARICOCELE	171	64.77
BILATERAL VARICOCELE	85	32.20
TOTAL	264	100%

Table 3. Distribution of patients according to grade of varicocele.

ULTRASOUND ABNORMALITIES	n	PERCENTAGE (%)
VARICOCELE GRADE I	45	17.04
VARICOCELE GRADE II	213	80.68
VARICOCELE GRADE III	06	02.27
TOTAL=	264	100%

The most represented grade of varicocele was grade II with 80.68%. grade III was associated with cases of testicular atrophy with weight ≤ 02.8 g for some.

4. Discussion

Our study focused on a sample of 264 men among whom the average age was 33 years with extremes ranging from 25 to 65 years. 149 patients or 56.44% were between 30 and 45 years old. This result is similar to those of Oumarou Alim *et al.* [11] and Mboudou *et al.* [12] in Yaoundé in 2004.

Primary infertility was present in 213 patients or 80.68%. This result is similar to those of Oumarou A. al [12] and Traoré Diori C. [13] who each found 70% primary type infertility in their different series.

The most common sperm abnormality was oligoasthenoteratozoospermia with 81%. The relationship between varicocele and oligoasthenoteratozoospermia was proven ($p < 0.005$). This result corroborates with data from the literature according to which the sperm profile of a patient with varicocele most often corresponds to oligoasthenoteratozoospermia [14]. F. Comhaire and A. Mahmoud [14] describe the abnormalities most frequently found during the spermiogram; semen analysis most often finds oligoasthenoteratozoospermia. This

result is in line with the results found in our study.

Although the link between varicocele and infertility is controversial, in our study it was proven that varicocele is a determining factor in infertility ($p < 0.005$).

The localization of the varicocele was mainly on the left side with 80.68%. This score is comparable to that of Mohamed Hicham Benazzouz [15] who found left varicocele in 80% to 90% of cases in 2014. This etiopathogenesis is poorly understood but the most likely hypothesis is the fact of the anatomical path of the vein left spermatic vein which empties into the left renal vein, unlike the right spermatic vein which empties directly into the inferior vena cava [9].

The most represented grade of varicocele was grade II with 80.68%. This result is different from that of Mohamed Hicham Benazzouz [15] who found 88.37% grade III varicocele during his study in 2014. This grade is often associated with a decrease in testicular volume. We found 4 cases of testicular atrophy and he found 3.

5. Conclusion

Varicocele is a frequent male pathology whose incidence is even greater in the population of infertile men. Its diagnosis is essentially clinical. Scrotal Doppler ultrasound can quantify venous reflux and analyze the testicular parenchyma. Sperm alterations concern both the concentration of spermatozoa, their mobility and their vitality. Even if the mechanism of alteration of the sperm parameters is not well elucidated, our study made it possible to make the link between the dilation of the veins of the pampiniform plexus and the above-mentioned sperm abnormalities. It should be recognized that varicocelectomy has allowed a significant improvement in the quality of sperm with the obtaining of a certain number of natural pregnancies and those resulting from medically assisted procreation. (Figures 1-4)

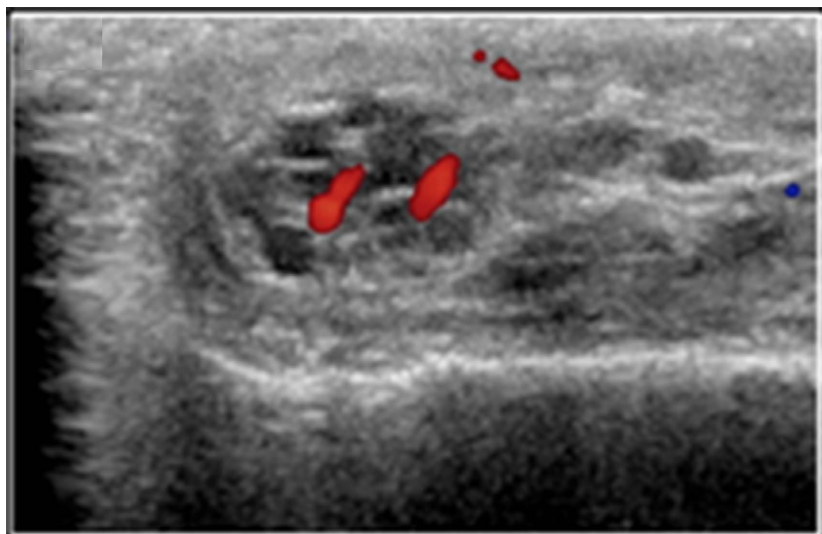


Figure 1. Grade I varicocele, images Color Doppler obtained at rest.

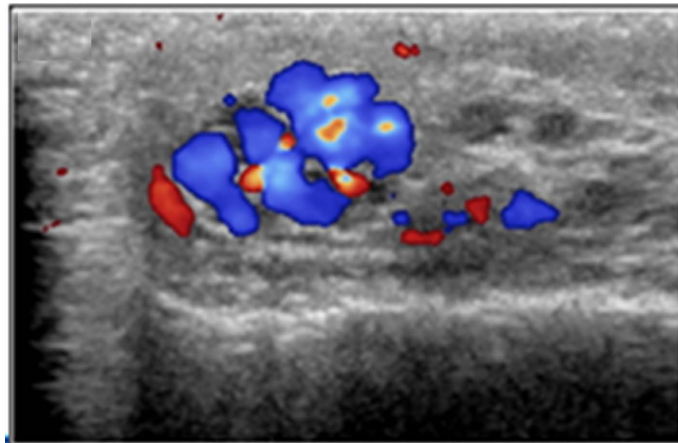


Figure 2. Grade I varicocele in Valsalva

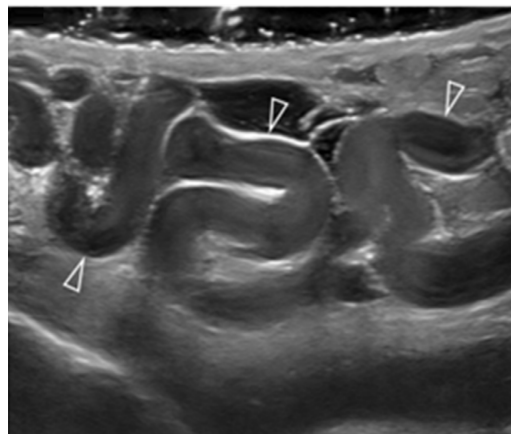


Figure 3. Grayscale appearance of the varicocele. Multiple hypoechoic serpiginous dilated veins (arrowheads) greater than 3 mm containing low-intensity internal echoes.

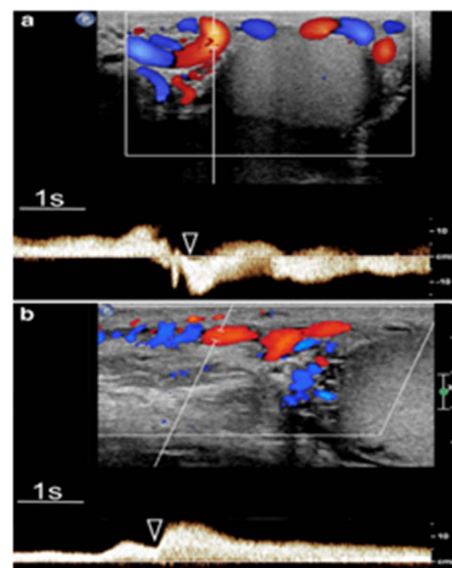


Figure 4. Spectral Doppler analysis in varicocele. Reflux changes while standing during Valsalva ((arrowhead). (a) reverse flow; (b) Increase in flow showing a Plateau throughout the Valsalva. In both cases the reflux persists for more than 2 s.

Authors' Contributions

All authors have read and approved the final version of the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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