

# Evaluation of Varicocelectomy in the Urology-Andrology Department of the Peace Hospital of Ziguinchor: Report of 52 Cases

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## Abstract

**Introduction:** Varicocele is a significant cause of male infertility and represents one of the most frequent reasons for consultation in urology and andrology services in Senegal. In sub-Saharan African societies, infertility in couples has long been considered a taboo subject, often placing social pressure primarily on women. The diagnosis of varicocele is mainly clinical but can be supplemented with scrotal Doppler ultrasonography. Treatment for varicocele associated with altered semen parameters may involve surgery (open or laparoscopic) or radiological embolization. The therapeutic choice depends on both the surgeon and the patient. The objective of this study was to evaluate the outcomes of varicocelectomy performed in the Urology-Andrology Department of the Peace Hospital of Ziguinchor. **Patients and Methods:** This was a retrospective, descriptive study conducted over a period of four (04) years, from January 2019 to December 2022. The parameters analyzed included epidemiological, diagnostic, therapeutic, and follow-up data. **Results:** A total of 930 patients were managed for urogenital pathologies, of whom 8% (n = 70) were treated for male infertility associated with varicocele. The age group 30 - 39 years accounted for 49% of patients. All patients consulted due to a desire for fatherhood. Primary infertility was observed in 75% (n = 39) of cases. A history of urological infection was found in 7.7% (n = 4) of patients. Active smoking was reported in 17% (n = 9), and alcohol consumption in 11.5% (n = 6). Varicocele was bilateral in 90% of cases. Semen analysis was abnormal in 98% (n = 51) of patients, with oligo-astheno-terato-necrozoospermia being

the most common combination of abnormalities, found in 32.7% (n = 17). Seminal cytobacteriological examination, performed in 37% (n = 19) of patients, did not isolate any pathogens. Hormonal assays (testosterone and FSH) were performed in 10% (n = 5), showing low testosterone levels (2 cases). Scrotal Doppler ultrasound revealed bilateral varicocele in 94% (n = 49) of patients. Open surgery was performed in 71% (n = 37), while laparoscopy was used in 29% (n = 15). During follow-up between 3 and 9 months, we observed normalization of all sperm parameters in 34.6% (n: 18) of patients. Within an average of five (5) months after surgery, 38.5% (n = 20) of natural pregnancies were achieved. **Conclusion:** Varicocele is a common male condition, with an even higher incidence among infertile men. Varicocelectomy appears to play an essential role in the management of men with varicocele and abnormal semen parameters, in the absence of other causes.

### Keywords

Varicocele, Male Infertility, Varicocelectomy

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## 1. Introduction

Varicocele refers to varicose dilatation of the veins of the anterior venous plexus of the spermatic cord (pampiniform plexus) [1]. Couple infertility is defined as the failure to achieve pregnancy after 12 months of regular unprotected sexual intercourse and may be classified as primary or secondary. Male infertility is one of the most frequent reasons for consultation in Urology and Andrology Departments in Senegal [2]. According to the World Health Organization (WHO), the number of subfertile couples is estimated between 60 and 80 million, representing approximately 15% of couples of reproductive ages [3]. Moreover, the literature clearly attributes a male factor in at least 60% of cases [3]. For a long time, infertility has been a taboo subject in sub-Saharan African societies, traditionally attributed to women, who often bear the social consequences within the marital context. However, studies conducted in Senegal have shown that male infertility is twice as common (31.7% versus 14.7%) as female infertility [4]. The diagnosis of varicocele is clinical, supported by scrotal Doppler ultrasonography and semen analysis. The evaluation of its severity has led to recommendations by scientific societies [5]. The work of Gat *et al.* [6] in the early 2000s revolutionized the understanding and treatment of varicocele. The choice of surgical technique (open or laparoscopic) depends on both the surgeon and the patient. The objective of this study was to evaluate the outcomes of varicocelectomy in the Urology-Andrology Department of the Peace Hospital of Ziguinchor.

## 2. Patients and Methods

This retrospective, descriptive study was conducted over a period of four (04) years, from January 2019 to December 2022. It included all infertile patients fol-

lowed in the department and operated on for varicocele, who were married to a woman under 45 years of age with no menstrual disorders and whose fertility assessment (physical examination, hormone assays, hysterosalpingography) was normal. Patients lost to follow-up, patients with non-operated varicocele, those with obstructive azoospermia, those with incomplete medical records, and cases of couple infertility due to causes other than varicocele were excluded.

The parameters studied were:

1) Epidemiological: frequency of varicocele surgery, age of patients and their spouses.

2) Clinical: reasons for consultation (type of infertility, scrotal pain, scrotal heaviness, chronic scrotal swelling); medical-surgical history (urogenital infections, hypertension, diabetes; scrotal trauma, testicular dystopia, inguinoscrotal hernia, spermatic cord torsion), presence of gynecomastia; testicular characteristics (position, size, consistency), epididymis, presence of varicocele (side and grade).

3) Para-clinical: preoperative semen analyses, hormonal assays (FSH, LH, total testosterone), and scrotal Doppler ultrasound.

4) Therapeutic: type of surgery (laparoscopy or open surgery by inguinal approach) and immediate postoperative complications.

5) Follow-up: postoperative semen parameters (at 3, 6, and 9 months) and spontaneous pregnancies (at 3, 6, 9, and 12 months).

6) Sperm analysis performed in the laboratory using the SCA (sperm class analyzer<sup>R</sup>) automated system.

Qualitative variables are presented as counts and proportions, and quantitative variables as means with standard deviations.

### 3. Results

During the study period, 930 patients were treated for urogenital pathologies, of which 8% ( $n = 70$ ) were followed for male infertility and varicocele, among whom 52 were included. The 30 - 39-year age group represented 49% of patients, with a mean age of  $38.48 \pm 7.09$  years (range: 25 - 53 years). The mean age of the spouses was  $30.6 \pm 6.68$  years.

All patients consulted due to a desire for fatherhood; scrotal pain and chronic scrotal swelling were present in 6% ( $n = 3$ ) each. Primary infertility accounted for 75% ( $n = 39$ ) of cases. A history of urological infection was found in 7.7% ( $n = 4$ ) of patients (2 cases of orchiepididymitis, 1 case of urethritis, and 1 case of urogenital schistosomiasis). Type 2 diabetes was present in 4%. No history of scrotal trauma, inguinoscrotal hernia, testicular dystopia, spermatic cord torsion, or pelvic surgery was reported. A family history of infertility was found in 6% ( $n = 3$ ). Active smoking was noted in 17% ( $n = 9$ ) and alcohol consumption in 11.5% ( $n = 6$ ). Use of phytotherapy was reported in 4% ( $n = 2$ ).

On examination, unilateral or bilateral testicular hypotrophy was noted in 21% ( $n = 11$ ). Varicocele was diagnosed in all patients: it was bilateral in 90% of cases,

and left-sided in 8%. Grade II varicocele accounted for 75% (n = 39) (**Table 1**). Semen analysis was abnormal in 98% (n = 51) of cases, with a mean semen volume of 3 mL. Normal sperm count was observed in 21.1% of cases. Asthenozoospermia was the most common qualitative abnormality (87%), followed by necrozoospermia (81%) and teratozoospermia (71%). Oligozoospermia was the most common quantitative abnormality (94.2%). Azoospermia was found in 5.8% (n = 3). Oligo-astheno-terato-necrozoospermia was the most common combination of abnormalities (32.7%, n = 17), followed by oligo-astheno-necrozoospermia (13.5%) and astheno-necrozoospermia (7.8%) (**Table 2**).

**Table 1.** Distribution of patients according to the clinical grades of varicocele (Dubin and Amelar classification).

Grade clinical varicocele	effective	Percentage %
Grade I	0	0
Grade II	39	75
Grade III	13	25
TOTAL	52	100

**Table 2.** Comparison of rates, anomalies, spermiological pre-operative and post-operative.

Sperm abnormalities	% Preoperative	% Post-operative
Oligozoospermia	73.08	42
Asthenozoospermia	87	50
Teratozoospermia	71	31
Necrozoospermia	81	54
Azoospermia	5.8	5.8

Seminal cytobacteriology, performed in 37% (n = 19) of patients, did not detect any pathogens. Hormonal assays (testosterone and FSH) performed in 10% (n = 5), showing low testosterone levels (2 out of 3 patients with azoospermia). Scrotal Doppler ultrasound performed in all patients confirmed bilateral varicocele in 94% (n = 49), left-sided varicocele in 6% (n = 3), and right-sided testicular hypotrophy in 79%.

Open inguinal surgery was performed in 71% (n = 37) of patients, while laparoscopy was used in 29% (n = 15). Medical treatment with vitamins and trace elements was associated with 54% (n = 28) of cases.

During follow-up, semen analysis was performed at 3, 6, and 9 months in 56% (n = 29), 21% (n = 11), and 23% (n = 12) of patients, respectively. We observed normalization of all sperm parameters in 34.6% (n: 18) of patients. Postoperatively, azoospermia persisted in three patients. Within an average of five (5) months, 38.5% (n = 20) of natural pregnancies occurred in couples after varicocelectomy and complementary management.

## 4. Discussion

The detrimental influence of varicoceles on spermatogenesis and on the quality of semen analysis has been clearly demonstrated [7]. Its incidence can reach up to 22% among men in the general population. It is even more frequent in the population of infertile men, with an estimated incidence of 40% when semen parameters are impaired [8].

The age group most represented in our study was 30 - 39 years, a finding also reported in a study conducted in Conakry [9]. This corresponds to the typical age for marriage, during which young couples experience heightened concern and social pressure regarding their first pregnancy, often prompting them to seek medical consultation.

The majority of patients in our series consulted for infertility. This result is comparable to that of Diallo AB *et al.* [9] in Conakry, where 80.7% of patients presented with infertility. Conversely, Bolanga BR *et al.* [10] reported a lower rate of 50% for male infertility as the reason for consultation. Indeed, varicocele is the leading cause of male infertility, diagnosed in over 35% of infertile men [11]. In our study, infertility was predominantly primary. This observation is consistent across several studies [12]-[14], which also found a predominance of primary infertility (Table 3). This trend may be explained by the stronger desire for conception among newly married couples.

**Table 3.** Comparison of the frequencies of primary and secondary infertility based on data from the literature.

Studies	% Primary Infertility	% Secondary Infertility
Our study	75	25
Frikh M <i>et al.</i> [12]	61.8	38.2
Diao B <i>et al.</i> [4]	68.4	31.6
Ndiaye M <i>et al.</i> [14]	78.6	21.4
Niang L <i>et al.</i> [17]	66.5	33.5

Our study identified a history of urogenital infections among patients. A review has shown that 13.5% of infertile couples suffer from urogenital infections, with a rate of 8.5% among male partners [7]. Urological infections therefore play a significant role in male infertility.

Varicocele induces histological lesions in the testicle, affecting all cell types and compartments, and is responsible for testicular hypotrophy. Its frequency varies widely from 29% to 87% [1]. We observed testicular hypotrophy both on palpation and by ultrasonography, predominantly bilaterally. Similar findings have been reported in the literature, where bilateral testicular hypotrophy has been noted in 59.15% to 62% of cases [13] [15]. According to the guidelines of the American Society for Reproductive Medicine (ASRM), one of the criteria for varicocelectomy includes infertility in adults and testicular hypotrophy in adolescents [16].

The determination of the affected clinical side and the grade of varicocele has been the subject of numerous studies. A bilateral predominance of varicocele has been evidenced by several authors, with rates of 74% and 96% reported [10] [15]. These results support our findings, which showed bilateral varicocele in almost all patients. Isolated right-sided primary varicocele is rare and may suggest anatomical anomalies such as situs inversus, venous malformation, or right renal tumor with venous extension [1]. Grade II clinical varicocele was predominant in our study, a finding also noted in other studies at rates of 84.7% and 56% [2] [10].

In the preoperative period, we found abnormal semen analysis in nearly all patients. This rate is comparable to that reported by Diallo AB *et al.* [9], who found 95% abnormal semen parameters. In the literature, studies by Niang L *et al.* [17] and Fouda JC *et al.* [18] reported necrozoospermia rates of 45.7% and 16.9%, respectively.

Prospective randomized studies on the treatment of varicoceles in adults have yielded conflicting results regarding the necessity for surgical intervention [19] [20]. The management of hypofertile men with varicocele has generated debate in the literature. While some authors advocate surgery combined with vitamin supplementation, others recommend therapeutic abstention. As highlighted in a Cochrane meta-analysis and by authors such as Madgar, varicocelectomy in hypofertile men whose only etiological factor is varicocele has led to improved semen parameters and fertility. However, studies by Nieschlag, comparing two groups of hypofertile men with varicocele—one treated surgically and the other observed for 12 months—found no significant difference in pregnancy rates [5]. Tsampoukas G *et al.* [21] showed in a meta-analysis that patients receiving vitamin supplementation after varicocelectomy exhibited significant improvement in semen parameters after 6 months compared to those without adjuvant therapy.

In Senegalese clinical practice, varicocelectomy is considered an indispensable step in achieving satisfactory semen quality. These findings support our therapeutic approach combining varicocelectomy with adjuvant vitamin therapy.

In line with existing literature [10] [18], we observed improved semen parameters following varicocelectomy. The impact of varicocelectomy on fertility in hypofertile couples remains a matter of debate. In the Cochrane review, Madgar reported that after 12 months, spontaneous pregnancies occurred in 60% of treated men compared to 10% in the observed group [5]. In our study, with a mean follow-up of 5 months post-varicocelectomy, we recorded 20 (38.5%) spontaneous natural pregnancies. Diao B *et al.* [15] noted significant improvement in semen concentration and motility, with a spontaneous pregnancy rate of 20.8% (Table 4). Varicocelectomy thus appears to play a key role in managing hypofertile men with clinical varicocele and no other identifiable cause. In contrast, no improvement was observed in patients with non-obstructive azoospermia.

**Table 4.** Spontaneous pregnancy rates according to data in the literature.

Studies	%Spontaneous Pregnancy
Diallo AB <i>et al.</i> [9]	35.3
Diao B <i>et al.</i> [15]	20.8
Fall B <i>et al.</i> [2]	26.1
Fouda JC <i>et al.</i> [18]	32.4
Notre étude	<b>38.5</b>

The limitations and difficulties of this study are related to its retrospective nature and the non-standardized use of adjuvant vitamin therapy which may induce bias.

## 5. Conclusion

Varicocele is a common male condition, with a particularly high incidence among infertile men. It is now regarded as a definitive cause of male infertility. The management of male infertility remains a clinical and therapeutic challenge, requiring a tailored approach. Varicocelectomy plays a critical role in the management of hypofertile men with clinically significant varicocele and no other identifiable etiology.

## Conflicts of Interest

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

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