

Treatment of Varicocele in Adults: Surgery versus Embolization: Experience of Mohammed V Military Instruction Hospital

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DOI: [10.36347/sasjs.2023.v09i05.013](https://doi.org/10.36347/sasjs.2023.v09i05.013)

| Received: 28.11.2022 | Accepted: 06.01.2023 | Published: 16.05.2023

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Abstract

Original Research Article

Introduction: Varicocele is a varicose dilatation of the spermatic cord veins, particularly the pampiniform plexus. It is a frequent and benign affection, which may have a harmful effect on spermatogenesis. **Aim:** Through this work, we will try to compare the efficiency, complications and recurrence after treatment of varicocele in two patients groups: surgery and embolization. **Material and Methods:** This is a retrospective study that included all patients treated for idiopathic varicocele, symptomatic or associated with abnormalities of the semen analysis, by embolization, between 2016 and 2021, at the Moulay Ismail Military Instruction Hospital. Thirty patients were included. To compare, the last 30 patients treated by surgery (open or laparoscopic) were included in a second group. Patients in the embolization group were treated with coil embolization or sclerosant agent under local anesthesia. We compared the efficiency, complications and recurrence rate after treatment of varicocele in both groups. The statistical analysis was carried out by the epidemiology laboratory of the Faculty of Medicine and Pharmacy of Fes using the Chi test 2 and Anova test. **Results:** Surgery has a higher success rate than embolization. However, embolization offers many advantages in terms of surgical time ($p = 0.001$), duration of hospital stay ($p = 0.001$), lower recovery time, and less long-term complications. Recurrence was found in 4 patients in group 1 and in 2 patients in group 2. In both groups, there was an improvement in semen analysis, with pregnancy occurred in one couple in group 2, and four in group 1. **Conclusion:** These two treatment methods are effective in the treatment of idiopathic varicocele, but embolization is a faster, less invasive technique with low postoperative morbidity.

Keywords: Varicocele, Treatment, Surgery, Embolization, Adult.

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INTRODUCTION

Varicocele is a varicose dilatation of the spermatic cord veins, particularly the pampiniform plexus. It is a frequent and benign affection, which may have a harmful effect on spermatogenesis. Numerous studies have shown that varicocele also has a deleterious effect on testicular growth [1, 2]. The purpose of treatment is to interrupt blood reflux, and suppress its consequences on the testicle, to improve fertility. Treatment modalities evolved from open surgery to laparoscopy and embolization. The debate is still topical between surgeons and interventional radiologists: what is the best technique? To this day, no technique seems to have demonstrated its superiority over others [3, 4]. Through this work, we will try to

compare the efficiency, complications and recurrence after treatment of varicocele.

MATERIAL AND METHODS

This is a retrospective study that included all patients treated for idiopathic varicocele, symptomatic or associated with abnormalities of the semen analysis, by embolization, between 2016 and 2021, at Mohammed V Military Instruction Hospital. Thirty patients were included. To compare, the last 30 patients treated by surgery (open or laparoscopic) were included in a second group. Patients in the embolization group were treated with coil embolization or sclerosant agent under local anesthesia. We compared the efficiency, complications and recurrence rate after treatment of varicocele in both groups. The statistical analysis was carried out by the epidemiology laboratory of the

Citation: El Bahri Abdessamad, Louardi Nabil, lamghari Aziz, Boukhlifi Youness, Alami Mohammed, Ameer Ahmed. Treatment of Varicocele in Adults: Surgery versus Embolization: Experience of Mohammed V Military Instruction Hospital. SAS J Surg, 2023 May 9(5): 410-414.

Faculty of Medicine and Pharmacy using the Chi test 2 and Anova test.

RESULTS

The mean age was 29.38 ± 8.50 years (15 to 55 years). For the first group, the mean operating time was 41.3 minutes, versus 26.5 minutes for the second group ($p = 0.001$) (Figure 1). No intraoperative complications were observed in the first group. For the second group, we observed three embolization's failure: one because of the presence of continent ostial valves at the end of the spermatic vein, and 2 because of venous spasm. No complications related to femoral puncture or anesthesia was found. The average length of hospitalization was 2.87 days (1-5) for the first group and one day for the second group ($p = 0.001$) (Figure 2).

For group 1, we noted 3 cases of postoperative hydrocele (10%) that resolved spontaneously. The average recovery time was 14.23 days. It was noticed that the pain disappeared in 8 patients, it decreased in 2 patients and 2 patients did not feel improvement in their pain after a 3-month reassessment. It was not increased in any patient. For group 2, 10 patients (33.33%)

presented an inflammatory orchitis which disappeared under analgesic and anti-inflammatory treatment. The average recovery time was 1.2 days. After a 3-month reassessment, we noted that the pain disappeared in 8 patients, decreased in 4 patients, increased in 1 patient and did not change in 1.

Comparing recovery time, it was quicker in group 2 than in group 1: 1.2j vs 14.23 d ($p = 0.001$) (Figure 3). We noticed a varicocele recurrence in 6 patients: 4 occurred in the first group (13,33%) and 2 in the second group cases (7.4%). No testicular atrophy was reported in both groups after treatment. Semen analysis comparison was done in 10 patients in group 1, and 11 patients in group 2. It revealed an improvement, however not statistically significant (Table 1). In group 1, 5 couples could not conceive, 3 couples were able to carry a pregnancy, a couple could conceive with the help of a medically assisted procreation and 4 patients were lost to follow-up. In group 2, 1 couple was able to carry a pregnancy, 2 couples could not conceive, 1 patient did not show a desire of immediate pregnancy and 3 patients were lost to follow up.

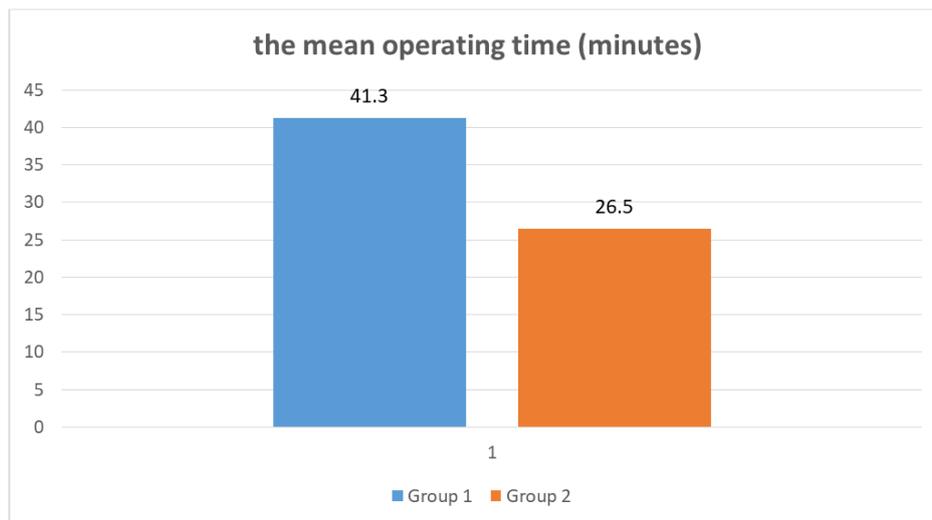


Figure 1: The mean operating time (minutes)

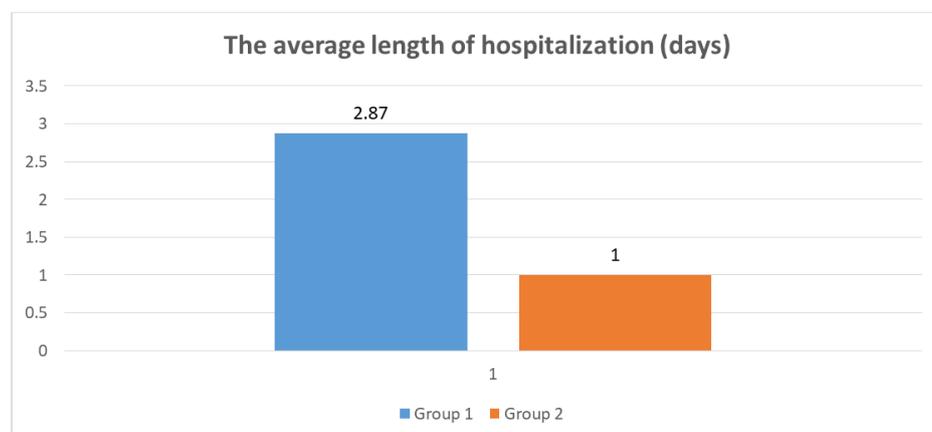


Figure 2: The average length of hospitalization (days)

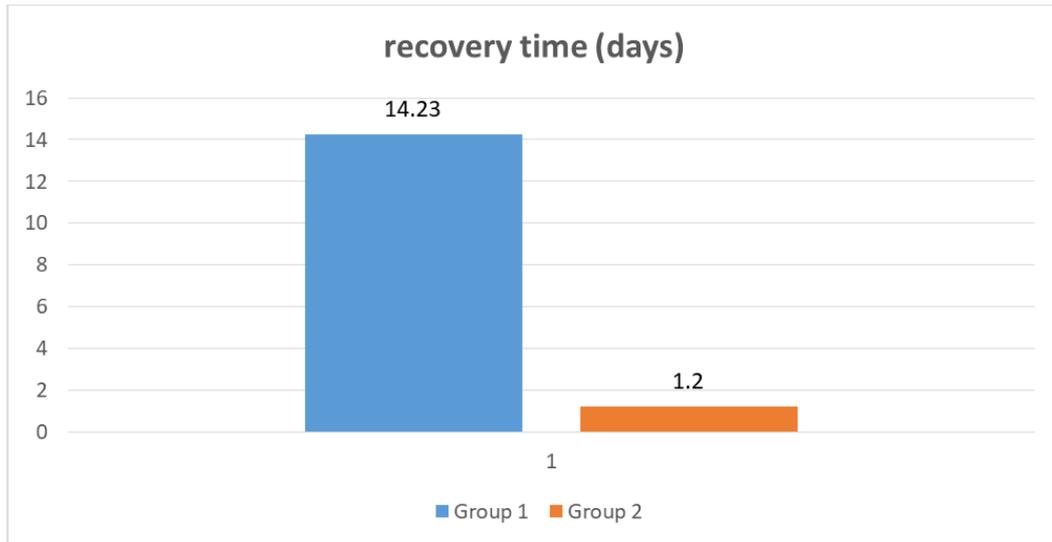


Figure 3: Recovery time (days)

Table 1: Quantification of sperm parameters according to the type of treatment

| Sperm count in each group (M / ml) | | | |
|--|---------------|----------------|-------|
| | Preoperative | Post operative | P |
| Group 1 | 34.6±28.28 | 43.3±30.7 | 0.458 |
| Group 2 | 46.55±54.54 | 65.45±49.99 | 0.313 |
| P | 0.543 | 0.242 | |
| Average mobility of spermatozoa in each group (% / 1H) | | | |
| | Preoperative | Post operative | P |
| Group 1 | 32± 17,32 | 48,2± 20,73 | 0,056 |
| Group 2 | 32.45±24.68 | 37 ,36± 29,99 | 0,105 |
| P | 0,962 | 0,352 | |
| Average sperm morphology in each group (typical %) | | | |
| | Preoperative | Post operative | P |
| Group 1 | 51,9 ±25,30 | 48,7±23,42 | 0,294 |
| Group 2 | 50.55 ± 28.66 | 49.7 ± 22.55 | 0,875 |
| P | 0,910 | 0.920 | |

DISCUSSION

Varicocele treatment relies, in almost all cases, on the interruption of venous flow between the renal vein and the testicle by ligation of dilated veins that drain the testicle [2]. The aim is to treat the patient with lowest morbidity, by suppressing venous retro-spermatoc reflux, while maintaining arterial supply and lymphatic drainage. In a retrospective study by Beutner *et al.*, comparing laparoscopy, retrograde and anterograde sclerotherapy, complications were 15%, 5% and 9%, respectively. Hydrocele was the most common complication with the laparoscopic approach. Orchiepididymitis was the most common complication for anterograde and retrograde sclerotherapy. This is comparable to our results. Nevertheless, the recurrence rate was lower with laparoscopic treatment (5% vs 16% with anterograde and 19% with retrograde sclerotherapy) [5]. A higher rate of complications, as well as a higher cost associated with laparoscopy compared to anterograde sclerotherapy, has been reported in another prospective study [6]. In our serie, embolization was clearly advantageous in terms of

operating time (26.5 min vs 41.3 min, $p = 0.001$), in the length of hospital stay (1 vs 2.87, $p = 0.001$) and the recovery time (1.2 vs 14.23, $p = 0.001$). However, the success rate was lower than surgery.

According to Sze *et al.*, gonadal vein duplication is common in patients with persistent or recurrent varicocele after surgery. Embolization effectively treats these cases, resulting in a high rate of clinical success [7]. According to Jargiello *et al.*, retrograde embolization is greater than varicocele surgery because of its ability to detect variants of the gonadal vein [8]. These recurrences appear more frequent in adolescents than in adults and are due to a higher potential for neovascularization. They are related to the development of collaterals which override the primary occlusion site [9]. In a recent meta-analysis conducted by Borruto *et al.*, open surgical approaches were compared to minimally invasive surgical approaches. It has been shown that there is no statistically significant difference between laparoscopic and open surgery concerning recurrence rate [10]. However, Ding's meta-analysis

concluded that cases of recurrent varicocele were significantly lower after microsurgery compared to open or laparoscopic surgery [11]. Diegidio *et al.*, reported that the lowest recurrence rate was 2.07% for the microsurgical subinguinal technique. Other techniques appear to have higher recurrence rate than microsurgical subinguinal technique. The recurrence rate was 9.47% for the microsurgical inguinal technique, 12.5% for the Palomo technique, 4.29% for the radiologic embolization, 15.65% for the classical inguinal surgery technique and 11, 11% for laparoscopy [12]. Until today, there are very few comparative studies.

In our series, we noted an improvement in sperm parameters in both groups, but this is not statistically significant. Several reasons can be put forward to explain the lack of significance of the results: lack of the power of the study, semen analysis before and after treatment could only be compared in 21 out of 60 patients, semen analysis were not all performed in the same laboratory, implying probable disparities in the methods of analysis and patients initially having a normal semen analysis were included. However, the results obtained are similar to numerous studies and Meta- analyzes published in the literature.

Nilsson *et al.*, published the first randomized controlled trial on varicocele in 1979, including 86 men with clinical varicoceles and infertility. They were randomized in 2 groups: patients treated with the Palomo technique and patients who have not received any treatment. The men were followed for 6 months. No difference between pre- and post-operative sperm analyzes was observed when comparing the treatment group to the monitoring group, and no difference in pregnancy rates was detected [13]. In a recent study, the role of anterograde scrotal sclerotherapy in the treatment of varicocele was evaluated in 59 infertile men with severe oligo-astheno-teratozoospermia (OAT). After an average time of 34.8 ± 3.2 months of follow-up, significant improvement was noted in mean concentration, motility, and sperm morphology in 36 patients (61%). Spontaneous pregnancy occurred in nine couples (15%) [14]. Surprisingly, it has been reported that the treatment of varicocele results in the production of a small amount of motile spermatozoa in the ejaculate of patients initially having non-obstructive azoospermia due to hypo spermatogenesis or maturation cessation [15].

CONCLUSION

The best treatment of primary varicocele has the lowest postoperative complications, the best outcome, the best semen analysis improvement and a good pregnancy rate. Both methods of treatment are effective in the treatment of idiopathic varicocele. However, embolization is a faster, less invasive technique with low postoperative morbidity.

CONFLICTS OF INTEREST

The authors do not declare any conflict of interest.

Contribution of the Authors

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

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