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Research Article

Antegrade Scrotal Sclerotherapy of Internal Spermatic Veins for Varicocele Treatment: Results and Complications about 660 Cases

Maatougui Jasser*, Raboudi Mehdi, Mohamed Amine Bakir, Taktak Tarek, Ben Rejeb Nadhir, Khiari Ramzi and Ghozzi Samir

Urology Department, Tunis Military Hospital, University of Tunis el Manar, Tunis, Tunisia

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ABSTRACT

Introduction: Varicocele is one of the leading causes of male infertility. Anterograde scrotal sclerotherapy (ASS) is one of the most recent techniques. Our objective is to evaluate the results of ASS in the treatment of varicocele in adults.

Methods: This is a descriptive and analytical study of 660 patients treated for varicocele causing either a picture of hypofertility and/or symptomatic during the period from January 2008 to December 2018. Preoperative, intraoperative and postoperative data were analysed.

Results: The average age was 30. The average duration of the intervention was 16 minutes (13-50 mins) and the average length of hospitalization was 19 hours (9-36 hours). We noticed a statistically significant improvement in all characteristics on the postoperative spermogram. Oligospermia increased from 41% to 29% (p=0.01), asthenospermia increased from 52% to 33% (p=0.02) and teretospermia from 24% to 14% (p=0.006). The paternity rate among hypofertile men was 22%. The disappearance of varicocele in postoperative was objectified in 588 patients (84%), the disappearance of scrotal pain in 322 patients (48%). Complications were identified in 70 patients (10.6%) hydrocele (27 patients, 4%), scrotal hematoma (14 patients), chemical orchitis (20 patients) and testicular atrophy (9 patients). A recurrence was noted in 73 patients (11%) at 9 months.

Conclusion: SSA appears to be a reliable and reproducible technique in the treatment of varicocele, with significantly less morbidity in comparison with other techniques. We recommend it as a first-line treatment.

Introduction

Varicocele is a varicose dilation of the pampiniform plexus in the spermatic cord most often in relation to valve incontinence of the spermatic venous network. It causes retrograde blood reflux to the testicles. It is often observed in the young subject with a predilection on the left side [1]. Its diagnosis is essentially clinical. Treatment is required in case of pain, infertility or testicular hypotrophy in adolescents. Therapeutic methods aim to interrupt blood reflux, either by embolization by retrograde or anterograde or by ligation of the spermatic vein by open surgery or coelioscopy. Varicocele is responsible for 35% of infertility cases in male couples [2]. It presents a major health problem in the world. Anterograde scrotal sclerotherapy is one of the most recent techniques. Nevertheless, its effectiveness and limitations remain to be studied. The purpose of our study was to evaluate the functional and morphological results of this technique.

Materials and Methods

Our study was conducted retrospectively in the urology department of them military hospital of Tunis. it interested all patients followed for varicocele who had anterograde scrotal sclerotherapy between January 2008 and December 2018. Our study included:

Correspondence to: Maatougui Jasser, Urology Department, Tunis Military Hospital, University of Tunis el Manar, Tunis, Tunisia; Tel: +21620505030; E-mail: jesser1992@hotmail.fr

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i. Patients consulting for scrotal pain and presenting a clinical varicocele.
ii. Patients consulting for hypofertility with spermogram abnormalities secondary to a varicocele. (Other infertility etiologies being eliminated).

The spermogram was performed in all patients. The studied parameters were: sperm volume, number, mobility and vitality of sperm at the first hour and this in accordance with the spermogram standards set by WHO [3]. The exclusion criteria were:

i. Subclinical varicocele.
ii. Recurrent varicocele.
iii. The presence of another cause of infertility (cryptorchidism, testicular atrophy secondary to trauma or history of twisted spermatic cord).
iv. The presence of azoospermia.
v. Patients whose data was missing from the medical observation.

The effectiveness of sclerotherapy was judged by assessing: success, recurrence, post-operative spermogram and the rate of spontaneous pregnancies.

i. Success: The disappearance of varicocele in clinical examination and ultrasound-Doppler at postoperative control.
ii. Failure: The persistence of varicocele regardless of grade at the postoperative clinical examination and/or the ultrasound-Doppler control.
iii. Recurrence: The reappearance of a treated varicocele whose disappearance has been confirmed by postoperative clinical examination and ultrasound-Doppler.

Postoperative follow-up was at least one year. The statistical analyses were carried out using version 20 of the SPSS statistics software. The signification threshold has been set at 0,05.

Results

The average age was 30 with extremes ranging from 18 to 46 years. The circumstances of discovery were dominated by scrotal discomfort in 56% of cases and hypofertility in 35% of cases. Those two signs were associated in 9% of cases. Varicocele was grade III in 60% of cases, grade II in 32% and grade III in 8% of cases. A testicular hypotrophy was found on clinical examination in 11.5% of cases with an average volume of 5.75 ml (4-8 ml) evaluated by ultrasound. The average diameter of the veins of the pampiniform plexus measured on ultrasound was 3,2 mm to the left (avec extremes ranging from 2 to 5 mm). The study of the preoperative spermogram had found a hypospermia in 27% of cases, an oligospermia in 34% of cases, an asthetenospermia in 66% of cases, and a teratospermia in 45% of cases. An oligo-asthéno-teratozoospermia was present in 9 patients (9,3%). pH was generally alkaline and more than 70% of our patients had a pH greater than 7.5. The average duration of the intervention was 16 minutes (13-50 min) and the average length of hospitalization was 19 hours (9-36 hours).

The overall success rate in our series was 81.2%. Recurrence of varicocele was noted in 12.5% of cases within an average of 9 months (minimum: 6 months, maximum: 12 months). We noticed a statistically significant improvement in all the characteristics on the postoperative spermogram. Oligospermia increased from 41% to 29% (p=0.01), asthenospermia increased from 52% to 33% (p=0.02) and teretospermia from 24% to 1% (p=0.006). The paternity rate among hypofertile men was 22%. The disappearance of varicocele in postoperative was objectified in 588 patients (84%), the disappearance of scrotal pain was objectified in 322 patients (48%). In terms of complications, seventy patients (10.6%) presented complications such as hydrocele (27 patients, 4%), scrotal hematoma (14 patients, 2%), orchitis (20 patients) and testicular atrophy (9 patients). A recurrence was noted in 73 patients (11%) at 9 months.

Discussion

The prevalence of varicocele in the general male population is about 15% [4]. Several studies have shown that varicoceles develop most often during puberty [5]. Its prevalence increases by about 10% for each decade [6]. Epidemiological studies had suggested that testicular venous incompetence increases with age, probably due to the failure of the venous valves [7]. The prevalence of varicocele in hypofertile men is in the range of 25% to 35% [8]. Varicocele is the cause of primary male infertility in 35% of cases infertility and in 80% of cases when it is a secondary infertility [9]. Many international publications have found in the population of hypofertile men a frequency of varicocele twice as high as in the fertile population, with an incidence between 30% and 40% [10]. In our country, Khouni's work had found varicocele in 38% of cases with infertility and 35% of cases of varicocele had a problem with hypofertility [11].

The diagnosis of varicocele is essentially clinical. Scrotal doppler ultrasound takes on its full importance when there is a diagnosis or as part of the assessment of infertility when an infra-clinical varicocele is suspected. Because of its safety and low cost, it is the first-line imaging test [12]. The spermogram is intended to assess the impact of varicocele on endocrine and exocrine testicular function. Several parameters can be studied: pH, volume of sperm, the count, mobility and vitality of spermatozoid and their morphology. The standards described here are those recommended by WHO [3]. The relationship between varicocele and sperm alterations may be due to increased venous pressure in the plexus pampiniform, which reduces arterial flow, causing chronic vasoconstriction of testicular arterioles, with hypoperfusion, stasis and hypoxia, and resulting in the accumulation of toxins.

Several therapeutic modalities are indicated in the treatment of varicocele, although none of them have been unanimous in its superiority over the others. The choice of the ideal method of treatment must meet these objectives: disappearance of the varicocele, preservation of testicular function, reduced morbidity at reasonable cost [13]. The principle of varicocele treatment is based on the interruption of the venous flow between the renal vein and the testicule. The technique we use the most is anterograde scrotal sclerotherapy. We compared our results with other series of literature. The volume of ejaculate varies in the literature between 1 and 6 ml. In our study the volume was normal in 73% of cases (Table 1).

Table 1: Preoperative sperm volume.

	Normal (%)	Hypospermie (%)	Hyperspermie (%)	Medium (ml)	Extremes (ml)	Ecart-type
Angel [3]	97,5	2,5	0	4,1	3 - 6	1
Ouanes [15]	66	22	12	3,5	2-3.2	1,2
Our Series	73	27	0	3,07	1-5,8	1,1

Necrospermia varies in the literature between 43% and 67%, in our study it was found in 38% of cases (Table 2).

Table 2: Spermatozoid vitality.

	Normal (%)	Nécrospermie (%)
Khouni [11]	39	67
Melek [14]	56,8	43,2
Ouan's [15]	40	52
Our Series	62	38

Asthenospermia varies in the literature between 65% and 93%. In our series, asthenospermie was present in more than 52% of cases (Table 3).

Table 3: Spermatozoid mobility at first hour before treatment.

	Normal (%)	Asthénospermie (%)
Khouni [11]	11,72	88,28
Melek [14]	34,1	65,9
Ouanes [15]	46	72,3
Our series	48	52

Normal morphology of spermatoizoid varies in the literature between 33% and 63%. A teratospermia was found in 24% of cases in our series (Table 4).

Table 4: Spermatozoid morphology.

	Normal (%)	Tératosperm (%)
Melek [14]	63,6	36,4
Ouanes [15]	52	40,4
Our series	76	24

Comparing different surgical techniques, the literature review has found a morphological success rate of around 82% for PALOMO ligation versus a 92% for celioscopy [16, 17]. Anterograde scrotal sclerotherapy, on the other hand, has slightly lower results with a success rate of 91%. In our series, the success rate was 84%. The recurrence rate was estimated at 11% (Table 5).

Table 5: Postoperative results.

Series	Number of cases	Treatment	Success	Failed
Ouanes [15]	207	Sclero. anterograde	95.2%	4.8%
TRUST 2006 [18]	88	Sclero. anterograde	93 %	7 %
Angel 2010 [3]	45	Sclero. anterograde	84,4 %	15,6 %
Our series	660	Sclero. anterograde	84%	11%

Regarding the results on pregnancy rates. Guidelines are more towards surgical or radiological management of varicocele to optimize the rate of conception [19]. The average pregnancy rate after treatment of varicocele is around 35% [19]. In our study, the average pregnancy rate was 22%. A meta-analysis, published in 2009 by CAYAN, has compared the pregnancy rate of different varicocele treatment techniques finding a slight predominance of the microsurgical approach with pregnancy in 41.9% of cases, followed by 37.6%, 36%, 33.2% and 30% respectively for PALOMO, IVANISSEVITCH, retrograde percutaneous embolization and coelioscopic approach. It should be noted that anterograde scrotal sclerotherapy was not included in this meta-analysis.

In terms of morbidity, the main post-operative complication of anterograde scrotal sclerotherapy is the occurrence of chemical orchitis and late hydrocele [20]. In our study the rate of orchitis occurrence was 3% with a 4% rate of late hydrocele onset. At the end of our work, we found some deficiencies. The main limitation of our study is its retrospective character. On the other hand, the collection of data was not without difficulties. Indeed, the information found in the medical records had sometimes lacked precision. Many of our patients were lost in sight and could not be reached, which further hampered long-term follow-up.

Conclusion

In light of our study, anterograde scrotal sclerotherapy appears to be a reliable and reproducible technique in the treatment of varicocele, with less morbidity and postoperative month stay in comparison with other techniques. We advocate it as a first-line treatment.

Conflicts of Interest

None.

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