



## RESULTS OF SURGICAL TREATMENT OF VARICOCELE

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### ABSTRACT

The study included the treatment results of 376 patients with left-sided varicocele admitted to the surgical department of the Tashkent City Clinical Hospital No. 1, named after Ibn Sino. Depending on the method of surgical intervention, two groups of patients were identified. In 2009-2014, 181 patients underwent conventional surgical interventions (Ivanissevich or Palomo operations), which made up the comparison group. From 2015 to 2022, 195 patients underwent subinguinal selective surgeries (antegrade endovascular sclerotherapy of the left testicular vein (LTV) and Marmar surgery), which were included in the leading group. So, compared to 2009-2014, the frequency of postoperative complications decreased from 12.7 to 2.6%, i.e., almost five times in the leading group. Antegrade angiosclerotherapy of PTV is more easily tolerated by patients compared to traditional operations, and this operation is cost-effective and reduces the length of hospital stay compared to other surgical interventions.

**KEYWORDS:** varicocele, diagnosis, treatment, Ivanissevich operation, Palomo operation, Marmar operation, antegrade endovascular sclerotherapy, complication.

## INTRODUCTION

Varicocele is a common male disease that can lead to morphofunctional disorders of the testicular tissue. The incidence of varicocele at the age of 10 to 25 years varies from 9 to 25.8%; the average is 16.3%. According to the WHO (1992), the disease occurs in 36% of males.

There is an urgent need for a selective approach to diagnostic methods and surgical treatment and to find minimally invasive and inexpensive methods that provide a solution to this problem.

To choose surgical treatment of varicocele, an individual differentiated approach is necessary for each patient with different types of pathological reflux of this pathology.

**Objective:** To improve the results of surgical treatment of various types of pathological varicocele reflux.

## MATERIALS AND METHODS

The study is based on the treatment results of 376 patients with left-sided varicocele who were admitted to the surgical department of Tashkent City Clinical Hospital No. 1. Ibn Sino.

Depending on the method of surgical intervention, two groups of patients were identified. In 2009-2014, 181 (48.1%) patients underwent standard surgical procedures (Ivanisevich or Polomo operations), which made up the comparison group.

From 2015 to 2022, 195 (51.9%) patients underwent subinguinal selective surgeries (antegrade endovascular sclerotherapy LV and Marmara surgery), which were included in the leading group.

To determine the direction of abnormal blood flow, i.e., abnormal blood reflux, USDPG was performed using a Trombett test.

When performing varicocelectomy until 2014, only traditional conventional methods were used (Table 1). 1), which have several severe and well-known disadvantages – high trauma of the intervention, an increased risk of postoperative wound complications, unsatisfactory cosmetic results, a long period of early rehabilitation, and a high frequency of disease recurrence. These circumstances prompted us to search for more gentle, less traumatic, and, at the same time, operator-friendly angiosurgical interventions.

**Table 1.**

Distribution of patients in the comparison group depending on the degree of varicocele, hemodynamic type, and choice of surgical intervention

Varicocele degree	Choice of surgical intervention					
	Ivanissevich's Operation			Ivanissevich operation Palomo		
	operation Hemodynamic type			Hemodynamic type		
	I type	I type	III type	I type	I type	III type
I degree	1	-	-	-	-	-
II degree	27	13	4	19	6	2
III degree	34	12	12	28	16	7
Total	62	25	16	47	22	9
Total	103			78		

Since 2015, we have chosen an individual, differentiated approach to the surgical treatment of varicocele, depending on the clinical course of the disease and the hemodynamic type. Thus, Iantegrade angiosclerotherapy of the left testicular vein (LTV) was used for renospermal type I (120 – 61.5%) and mixed type with predominance of renospermal reflux (III A type 19 – 9.7%), for ileospermal Itype II (42-21.5%) and mixed type with predominance of

ileospermial reflux (III B type 14 – 7.2%) varicocelectomy was performed according to Marmar (Table 2).

**Table 2.**

The distribution of patients in the leading group depending on the degree of varicocele, hemodynamic type, and choice of surgical intervention

Varicocele grade	Surgical choice			
	Antegrade angiosclerotherapy LTV		Marmar operation	
	Hemodynamic type		Hemodynamic type	
	I type	III A type	I type	III B type
I degree	1-1		-	1
II degree	58	7	9	4
III degree	61	12	33	9
Total	120	19	42	14
Total	139		56	

## RESULTS

Improving the choice of tactics for surgical treatment of varicocele, techniques for performing surgical intervention, reducing the trauma of surgical intervention, and other innovations developed and implemented in the framework of this study could not but affect the immediate results of managing this category of patients. Thus, compared with 2009-2014, the frequency of postoperative complications decreased from 12.7 to 2.6%, i.e. almost five times.

Long-term results were analyzed in 229 (60.9%) of 376 patients operated on for varicocele (Table 3). To assess long-term results, patients were subjected to a thorough questionnaire and outpatient and inpatient examination. Long-term results were studied in the period from 1 year to 12 years.

One of the leading indicators that characterize the effectiveness of surgical intervention in varicocele is the frequency of disease relapses. When studying the nature of relapse, the hemodynamic type of varicocele was compared.

Of the 229 patients examined in the long-term period, recurrence of varicocele was noted in 20 (8.7%) patients, while in the group of patients operated 9-2014 on in 2009-2014, this indicator reached 17.1%. Subsequently, due to the use of the innovations mentioned above and disease prevention measures, the frequency of disease relapses was reduced in the leading group of patients to 1.6%.

**Table 3.**

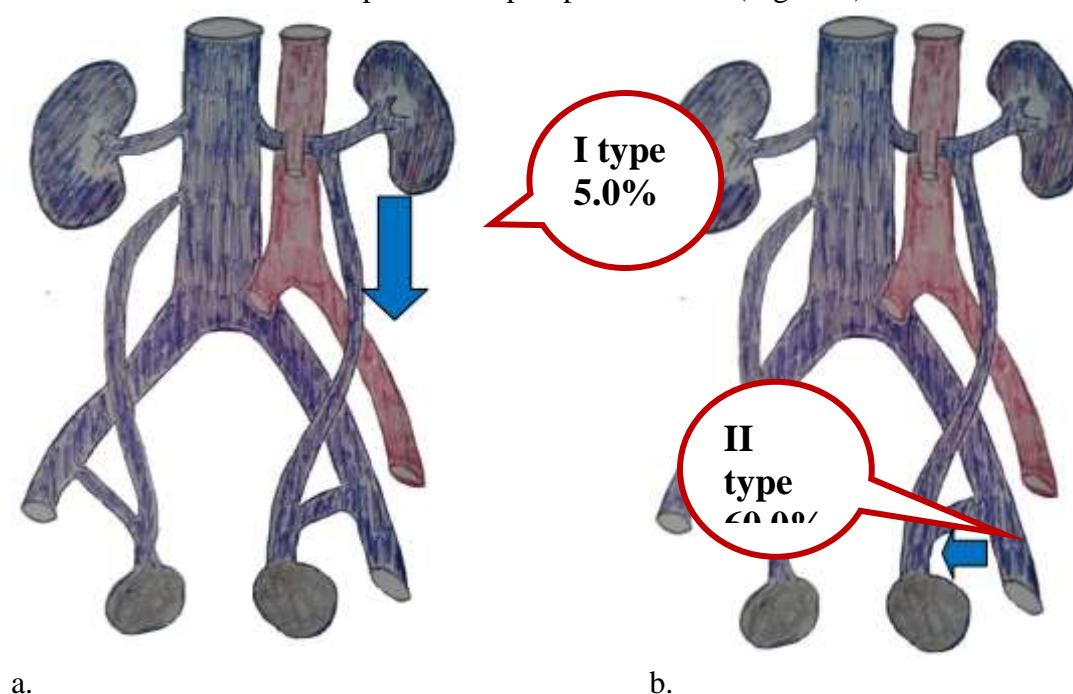
**Number of patients observed in the long-term postoperative period**

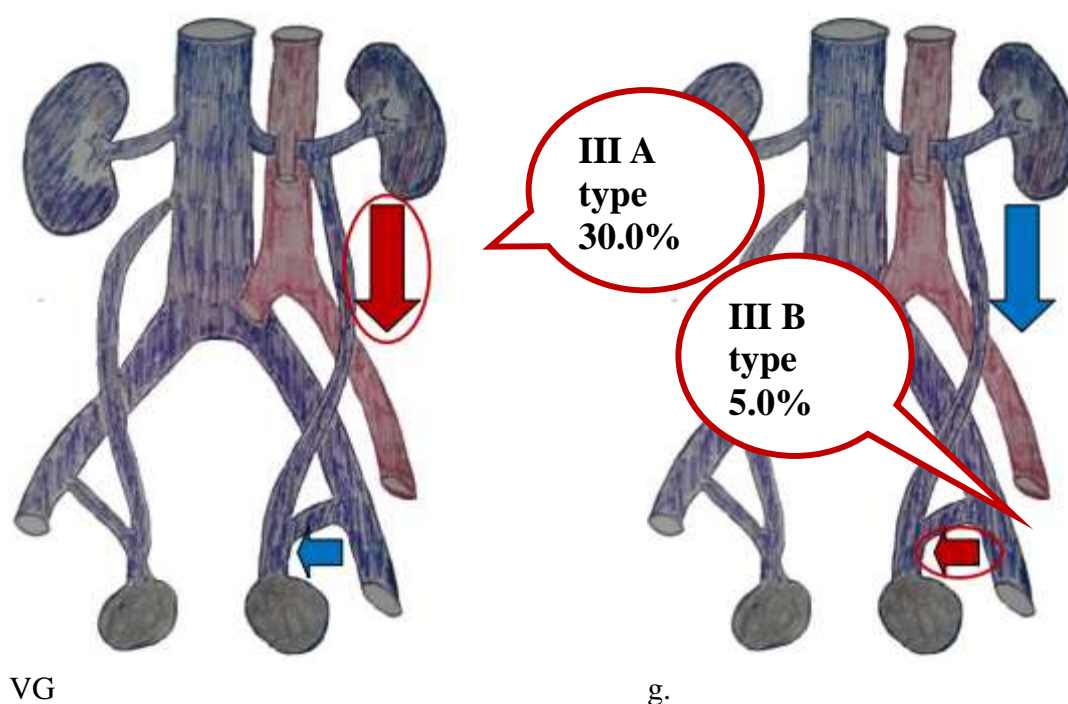
Hemodynamic type	The number of relapses depends on the type of operation								Total (n=376)	
	Comparison group				Main group					
	Ivanissevich operation (n=103)		Palomo operation (n=78)		Antegrade LV angiosclerotherapy (n=139)		Operation Marmar (n=56)			
	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%
I type	36	34,9	25	32,0	78	56,1	--	-	139	36,9
	2	5,5	1	4,0	-	-	-	-	3	2,1

II Type II	15	14,6	13	16,7	--	-	29	51,8	57	15,1
	6	40,0	3	23,1	--	-	1	3,4	10	17,5
III Type III	10	9,7	6	7,7	-	-	-	-	16	4,2
	4	40,0	2	33,3	-	-	-	--	-6	37,5
III A type	-	-	-	-	11	7,9	--	-	11	2,9
	-	-	-	-	1	9,1	--	-	1	9,1
III B type	-	-	-	-	-	-	6	10,7	6	1,6
	-	-	-	-	-	-	-	-	-	-
Total	61	59,2	44	56,4	89	64,0	35	62,5	229	60,9
	12	19,7,7	6	13,6	1	1,1	1	2,8	20	8,7

*Note: In the numerators, the number of observations in the long-term postoperative period; in the denominators, the number of relapses in the long-term postoperative period.*

In all 20 (8.7%) patients with recurrent varicocele, the hemodynamic type of pathological reflux was studied and compared with preoperative data (Figure 1).





**Figure 1.** The occurrence of varicocele recurrence depends on the hemodynamic type.

In a retrospective analysis of long-term outcomes, the vast majority of patients with relapses were type II and III type III (7.4%).

Thus, based on the immediate and long-term results of the surgical treatment of 376 patients with varicocele, we developed a therapeutic and diagnostic algorithm for managing patients in this category.

### CONCLUSIONS

1. ULTRASOUND Doppler scanning of testicular veins makes it possible to determine the degree of vascularization of the scrotal organs, which allows you to most reliably make an accurate diagnosis together with ultrasound data in B-mode and choose an adequate treatment strategy.
2. Various hemodynamic types of venous outflow caused varicocele recurrences through the internal seminal vein that were not accounted for during the primary operation. The prospect of improving the results of surgical treatment of spermatic varicose veins is the individualization of the surgical method, taking into account the type of pathological reflux;
3. The implementation of the treatment and diagnostic algorithm developed by us for managing patients with varicocele demonstrates a lower frequency of complications (2.6%) and relapses (1.6%) compared to conventional traditional methods of surgery (complications – 12.7%, relapse – 17.1%).

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