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ENDOVASCULAR EMBOLIZATION OF THE TESTICULAR VEIN DURING VARICOCELE. CLINICAL CASE

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Abstract

Varicocele is a pathology characterized by dilation of the venous veins of the seminal canal. Currently, the incidence of varicocele among adolescent men aged 12-20 years is 10-20%, and among men suffering from infertility, it is detected in 45%. In clinical practice, there are several methods of treating varicocele: open or microsurgical laparotomy, surgical embolization and laparoscopic varicocelectomy. However, the frequency of relapses of varicocele varies and depends on the method of its treatment. Embolization performed using venography helps to accurately determine the condition of the vessels of the testicles. Therefore, in our article we will describe the advantages and possibilities of modern minimally invasive treatment of varicocele embolization, possible complications and results.

Keywords:
varicocele, embolization, infertility

Варикоцеле кезінде аталық без көктамырының эндоваскулярлық эмболизациясы. Клиникалық жағдай

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Аңдатпа

Варикоцеле – аталық без көктамырының кеңеюімен сипатталатын патология. Қазіргі уақытта 12-20 жастағы жасөспірім ерлер арасында варикоцеленің пайда болу жиілігі 10-20% - ды құрайды, ал бедеулікпен ауыратын ерлер арасында 45% - да кездеседі. Клиникалық тәжірибеде варикоцеленің емдеудің бірнеше әдісі бар: ашық немесе микрохирургиялық лапаротомия, хирургиялық эмболизация және лапароскопиялық варикоцелэктомия. Алайда, варикоцеленің қайталану жиілігі әртүрлі және оны емдеу әдісіне байланысты. Венографияны қолдану арқылы жүргізілген эмболизация аталық бездердің тамырларының жағдайын дәл анықтауға көмектеседі. Сондықтан, мақаламызда варикоцеле эмболизациясының заманауи минималды инвазивті емінің артықшылықтары мен мүмкіндіктерін, мүмкін болатын асқынулары мен нәтижелерін сипаттаймыз.

Түйінді сөздер:
варикоцеле, эмболизация, бедеулік

Эндоваскулярная эмболизация яичковой вены при варикоцеле. Клинический случай

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Аннотация

Варикоцеле – это патология, характеризующаяся расширением венозных вен семенного канала. В настоящее время частота встречаемости варикоцеле среди мужчин - подростков 12-20 лет составляет 10-20%, а среди мужчин, страдающих бесплодием, выявляется у 45%. В клинической практике существует несколько методов лечения варикоцеле: открытая или микрохирургическая лапаротомия, хирургическая эмболизация и лапароскопическая варикоцелэктомия. Однако частота рецидивов варикоцеле варьируется и зависит от метода его лечения. Эмболизация, выполняемая с помощью венографии, помогает точно определить состояние сосудов яичников. Эмболизация, проведенная с использованием венографии, помогает точно определить состояние сосудов яичников. Поэтому в нашей статье мы опишем преимущества и возможности современного малоинвазивного лечения эмболизации варикоцеле, возможные осложнения и результаты.

Ключевые слова:
варикоцеле, эмболизация, бесплодие

Introduction

Varicocele has been popular in clinical practice for over a hundred years. According to statistics, among men with primary infertility, its prevalence is about 45% [5], and 70-85% of men with secondary infertility suffer from this disease. In a study of 6,200 boys aged 0 to 19 years, varicocele was found in 4.1% of the total study population and 7.9% in the 10 to 19 year group [3] in a large population-based study, conducted in 2013 with the participation of 1.3 million Israeli male adolescents aged 16.5 to 19.5 years, the prevalence of varicocele was detected in 17.5 over the entire period of the study occurred from 1.6 to 4.6% [4].

Given the polyetiological disease of varicocele, the main causes of which can be called congenital malformations of the testicular veins, congenital insufficiency of the testicular valves. Lesions are most often left-sided, bilateral location is about 10%, only right-sided - 1-2% [5]. Varicocele is more often clinically detected on the left than on the right, and is more often unilateral than bilateral. The reason, of course, is due to its anatomical location, the left spermatic vein drains into the left renal vein, while the right one drains directly into the inferior vena cava on the anterolateral wall below the right renal vein. The greater prevalence of left-sided varicocele is thought to be secondary to the unique angle at the confluence of the left spermatic and renal veins, resulting in increased hydrostatic pressure.

The consequences of varicocele on testicular function in childhood and adolescence are less well understood. This complicates the standard approach. The challenge now is to determine which patient should be treated, when, and what type of treatment should be preferred.

Based on clinical research, varicocele is classified (Dubin M.D., 1970):

1. Subclinical type or grade 0, not palpable or not apparent at rest, manifested by Doppler ultrasonography.

2. Varicocele with clinical manifestations or test (Valsalva) of which is “positive”. Such a varicocele is further subdivided into:

I degree - dilatation of the veins of the ovary is determined only by palpation during the Valsalv test in the upright position of the patient;

II degree - dilated veins without a sample are clearly visible and visible in the upright position of the patient.

III degree - dilated vessels are clearly visible and palpable, a decrease in testicular volume is determined.

According to the nature of venous reflux, varicocele is classified (Coolsaet B.L., 1980):

- with renotesticular;
- with ileotesticular,
- with mixed variant of reflux.

Since varicocele is manifested in clinical practice by many subclinical and clinical manifestations, and in order to prevent complications, varicocele should first be assessed clinically using the Dubin and Amelor scale. Hormone testing (including AMH and inhibin B in childhood and LH, FSH, and total testosterone in adolescence) should be performed for a comprehensive assessment of testicular function. It is important to note that semen analysis is critical and may be requested at least 1.5 years after puberty.

Laparoscopic varicocelectomy was first described in the early 1990s and has since gained widespread success and has been accepted as a simple, safe, and minimally invasive procedure in adults and children. It has a number of advantages over other non-microsurgical inguinal approaches, such as excellent visualization of the seminal vessels, which is especially useful in obese patients, and allows for separate ligation of the seminal veins while sparing the arteries. In a bilateral varicocele, this allows both sides to be treated in a single session, but a risk of hydrocele development has been reported in 25% of patients.

Radiographic approaches include venography to identify the internal spermatic and collateral veins, followed by venous occlusion using a variety of occlusion and embolization techniques. The recurrence rate of varicocele is highly variable and ranges from 0.6% to 45% depending on the treatment approach. The effectiveness of varicocelectomy for the treatment of infertility is determined based on the improvement in serum testosterone levels, semen parameters and, ultimately, the pregnancy rate after treatment. In patients with scrotal pain, pain relief is the primary goal.

With regard to endovascular varicocele embolization, it can be performed under local anesthesia to avoid the complications of general anesthesia. This can be done without damaging the perivascular tissues as it is a purely endovascular technique. Another advantage of embolization is bilateral access, which can be performed in the same place with the same venous access.

Endovascular embolization has low morbidity and complications with a high probability of long-term success, which increases its cost-effectiveness

compared to surgery, which has led some authors to recommend endovascular embolization as the first approach to treating varicocele.

The aim of the study: the role of X-ray surgical methods in the early diagnosis of patients with varicocele and improvement of the treatment results with X-ray endovascular embolization.

Case report

Patient K., 42 years old, on September 10, 2021, was admitted to the Department of Interventional Surgery and Arrhythmology of the City Clinical Hospital No. 7 in Almaty with a diagnosis of right-sided varicocele. From the anamnesis: According to the patient, 3 months ago, at a preventive examination by a urologist, according to the results of ultrasound of the scrotum, the diagnosis was «right-sided varicocele». On examination, the condition was satisfactory. Urination free, painless. No tingling symptoms were observed. Urine was light. The development of the external genitalia corresponds to age. Secondary sexual characteristics are formed correctly, according to the male type. Testicles in the scrotum, normal size, oval, painless on palpation. In the orthostatic position in the right half of the scrotum, a conglomerate of varicose veins of the pampiniform plexus is visually and palpably determined, soft-elastic consistency, slightly painful on palpation, increases during the Valsalva test. After planned instrumental and laboratory studies, it was decided to conduct surgical treatment of the patient. Result: After processing the surgical field under local anesthesia S.Novocaini 0.5%-20.0, puncture and catheterization of the common femoral vein on the right according to Seldinger was performed. A 6F introducer was installed. Using a hydrophilic conductor 0.035, the SIM1, SIM3, MP 4Fr catheter and the latter were selectively placed in the lumen of the orifice of the testicular vein on the right. The right testicular vein enters the inferior vena cava. The vein is sharply dilated, retrograde blood flow. May-Turner syndrome was not identified. Next, the MP type catheter was placed as distally as possible into the lumen of the testicular vein and endovascular embolization was performed with AZUR 18 Pushable 8x10 coils. Next, sclerotherapy with «Ethoxysclerol» 3% 8 ml is given. And above the sclerotic area, embolization was performed with AZUR 35 Pushable 8x14 coils. Control - stop contrast in the lumen of the testicular veins on the left. The catheters and introducer are removed. The artery was clamped for 15 minutes. An aseptic bandage was applied to the puncture site. There were no complications during the operation. Discharged on the 3rd day after admission in a satisfactory condition. When examined after 2 months: urine is normal, without pain. The scrotum was not swollen, the Valsalva test was negative. The pain is gone. Sexual abilities are preserved. It is recommended to take a semen analysis and andrologist's observations.

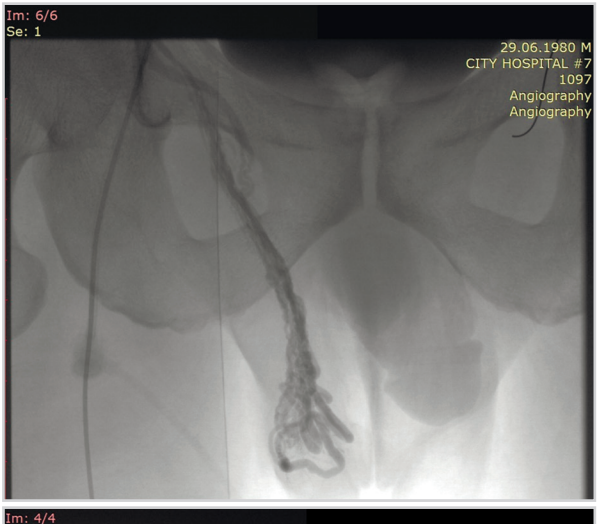

Figure 1.
With phlebography performed from the right-sided femoral vein, the expansion of the right-sided veins of the scrotum is determined

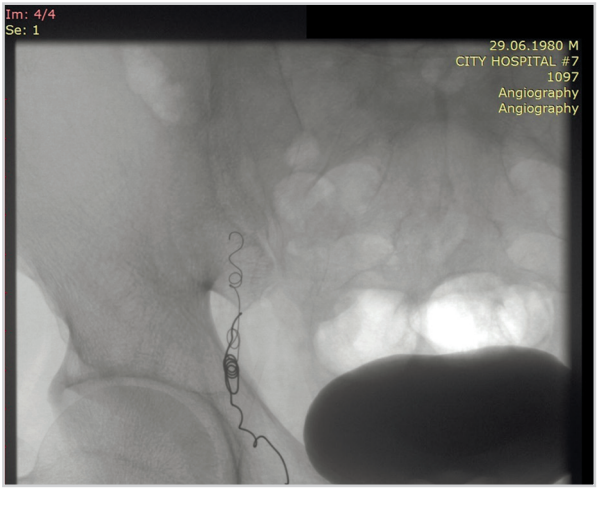

Figure 2.
Period after embolization of scrotal branches with embolus «AZUR 18 Pushable 8x10»

Discussion

Percutaneous embolization is the least invasive of all the treatments. Unlike traditional surgical treatments, percutaneous interventional approaches do not require surgical incisions and therefore can be performed under local anesthesia, while surgical approaches require more extensive anesthetic preparations. The use of venography allows accurate identification of the internal spermatic veins, in addition to any collateral venous supply that may contribute to clinical pathology. In addition, the transvenous method virtually eliminates the possibility of damage to the testicular artery, which theoretically leads to a reduction in complications associated with pain and testicular atrophy.

For left-sided varicocele, the most common approach is the right common femoral vein. Right-sided access is usually preferred because it is technically simpler and provides the optimal angle for catheter access to the left renal and internal spermatic veins. With right-sided varicocele, access to the internal jugular or basilic vein is more often used. The right internal spermatic vein is usually located at an acute angle to the right anterolateral inferior vena cava just below the right renal vein, resulting in straight line access from the access point to the internal jugular vein.

Venography is performed by placing the patient in the reverse Trendelenburg position, or by having the patient perform a Valsalva maneuver. This is useful for confirming the diagnosis and mapping venous collaterals. The typical venous collateral pattern is the bifurcation of the internal spermatic vein into medial and lateral divisions at the L4 level. There is often cross communication between the left and right seminal veins. Recognition of the presence of collateral pathways is critical, as failure to interrupt these collateral pathways may contribute to the persistence or recurrence of a varicocele.

Embolic agents commonly used for varicocele embolization include mechanically occlusive solid and liquid embolic agents. Solid embolics include coils and vascular plugs. Azura 35 coils are often used on our side. Patients should be observed for approximately 2-3 hours after the procedure before being discharged home. Although patients can return to their normal activities within 24-48 hours, they are advised to avoid heavy lifting and contact sports for 5-7 days and eat a diet for 3 days to prevent constipation. Follow-up Doppler ultrasonography is performed after 3 months and semen analysis after 4-6 months in patients undergoing therapy for infertility. At follow-up, even though veins may be visible on examination, the success of the procedure is determined by the absence of retrograde blood flow.

Percutaneous embolization remains an excellent choice for patients who relapse after surgery. Serious complications of embolization are rare. While venous perforation is relatively common during the procedure, it rarely results in major bleeding. Even accidental unintentional perforation of an artery, such as damage to the femoral artery, rarely leads to serious consequences. Coil migration is a known risk in embolization procedures, but is quite rare. The advantages of X-ray varicocele embolization therapy outweigh its high technical and clinical achievements, an alternative to surgical treatment in terms of results and very low complication rate. This is a minimally invasive procedure that provides a quick recovery for the patient, minimal discomfort compared to open surgery, and a short time (usually within 1-2 days) to return to work and a fulfilling lifestyle. It is more economical compared to traditional surgery as the costs of the procedures are minimal. An additional advantage of the embolization method is that a bilateral varicocele can be treated at the same site with venous access, and also has a high technical success in the treatment of recurrent varicocele after surgical ligation.

Conclusion

Percutaneous varicocele embolization is a safe procedure for both adults and children. Embolization offers certain advantages over surgery, such as the possibility of venography and the use of local anesthesia instead of the more invasive method of anesthesia. However, embolization carries a risk, albeit a small one, of technical failure and hence the need for further surgical treatment. In addition, the recurrence rate after embolization is higher than after surgical interventions. With careful patient selection and prior counseling, embolization can be appropriately used as a safe and effective treatment option for symptomatic varicocele. Over the past two decades, endovascular treatment has gained recognition as an effective alternative to surgery. Indeed, the advantage of percutaneous embolization is that it is an outpatient procedure, a faster return to normal activities, significantly cheaper than surgery, and a lower recurrence rate.

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