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V.N. Karazin Kharkiv National University

VARICOSE VEINS OF LOWER EXTREMITIES

Methodical recommendations
for students of higher medical education in the discipline of «Surgery»
Faculty of Medicine

Electronic edition

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Methodical recommendations are worked out on the basis of the Programs of disciplines of «Surgery» for students of higher medical educational institutions of III–IV levels of accreditation, authorized by Ministry of Health of Ukraine. These recommendations are intended for the 5 th year English-speaking medical students.

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Introduction

The varicose veins of legs (varicose illness) represents diseases of a venous wall and valves which lead to chronic venous insufficiency. According to the literature, 10–17 % of population of people is ill varicose illness. The ratio of men and women makes 2 : 4. More frequent the left leg is affected and also the great saphenous vein did in comparison with the lesser (short) saphenous vein.

The following classification of varicose illness {disease} is used in clinic:

1. By the etiological factor: a primary and secondary the varicose veins of legs;
2. By an anatomical principle recognize dilatation:
 - V. Saphena magna; the great saphenous vein (GSV).
 - V. Saphena parva;
 - the small saphenous vein (SSV).
 - vv. subcutaneus;
3. Under the form of varicose dilatation recognize following forms:
 - Cylinder;
 - Sinuous, scattering;
 - mixed;
4. Stages of development of disease:
 - Compensation;
 - Subcompensation;
 - Decompensation;
5. Under the expression of disturbances of a venous circulation recognize I, IIA, IIB and III degrees;
6. Under the state of the valval apparatus of veins recognize: without disturbance of functions of valves; with a failure of valves;
7. Under the character of complications:
 - Complicated by bleeding;
 - Complicated by thrombophlebitis;
 - Complicated by ulcer of crus.

It is necessary to remember factors which provide a normal venous hemodynamic. The venous system of the inferior extremities consists of two rather isolated systems, where the fascia is an interface: superficial or subcutaneous veins are placed over fascia and deep veins are placed sub- fascia, connection between which is carried out by communication (perforated) veins. Feature of veins of the inferior extremities is presence in them of venous valves which oppose retrograde blood flow and support it to the heart. Propulsion of the blood is promoted also by heart beats, by reduction of muscles of shin (a muscular-venous pump) and femur, sucking action of a thoracic cavity. Also the important role belongs to a tonus of venous wall. In norm the blood flows from periphery to the center, and on

communication veins – from superficial in deep. The causes of the varicose veins of legs are precisely unknown. Following theories are offered: genetically, endocrine, neurotrophic, mechanical, different physiologic and pathological factors which promote rising of intra-abdominal pressure.

There are promoted and produced factors. The former are physiological conditions of a blood flow in the inferior extremities, age's changes of venous wall, congenital delicacy of elastic and muscular fibers.

To the second are mechanical difficulties of outflow, shunt of blood from system of deep veins in superficial (Fig. 1).

The listed factors lead to a valves failure of superficial veins. In pathological conditions at a lesion of the valval apparatus begins retrograde filling of veins of the legs from top, and the blood flow in perforated veins goes from deep to superficial veins (the blood stream is kinked).

Features of patient examination with suspicion on the varicose veins of legs.

At inquiry of the patient:

Patients complain on sensation of heaviness, completeness and spreading, fatigabilities in the leg. It is sponginess pastoseness or edema, a burning pain in a field of a phlebectasia, night spasms of muscles of crus, a pain. At the collecting of the anamnesis it is necessary to specify the cause of disease, a working condition and heredity.

Clinical physical examination

On the view there are separate varicose units, their conglomerates that collapsed in horizontal position. There are typical localizations of varicose units which fit with localizations of perforated veins: a point of sapheno-femoral anastomosis, boundary of middle and inferior third of femur, top thirds of crus on a medial surface, an epimalleolar field. Also on the view it is possible to find out complications of varicose disease which are display of a stage of adecompensation. The clottage of varicose veins and a thrombophlebitis, a varicose ulcer, dermatitis, a pigmentation of skin, lymphangitis, bleeding from a varicose ulcer.

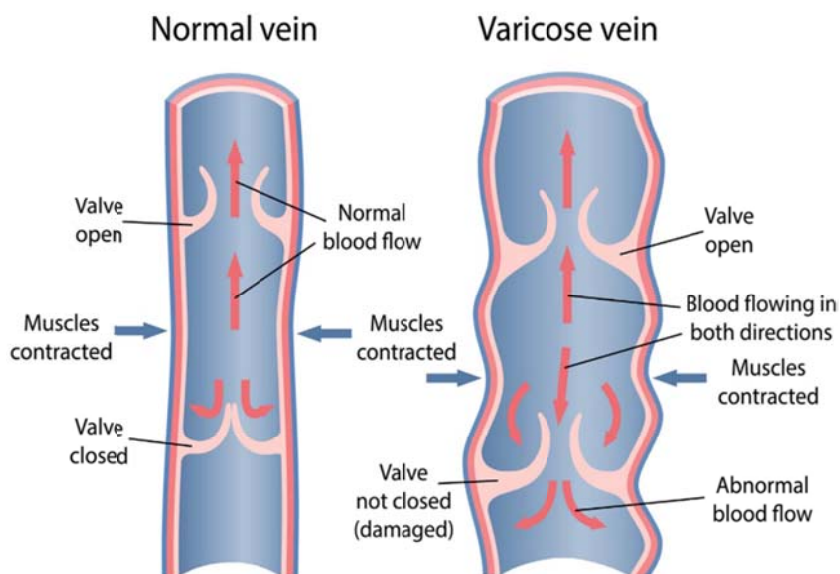


Fig. 1. Retrograde blood flow in the incapable of valves with varicose veins

The clinical characteristic of a chronic venous failure I degree. The chronic venous failure I degree answers a stage of compensation. It is characteristic the absence of complaints. Patients mark sensation of heaviness and completeness after an exercise stress. On the view of patients in vertical position probably slightly expressed dilating of branches of the vv. Saphena magna et parva. The valval apparatus is not damaged due to functional tests.

The clinical characteristic of a chronic venous failure II A degree. For a chronic venous failure II A degree which answers a stage of sub-compensation, characteristic are complaints on sensation of heaviness, completeness and spreading, sponginess pastoseness, edema in the leg, burning pain in a field of a phlebectasia which arise in the end of day and pass till the morning. On the view of the patient in vertical position it is possible to note an appreciable the varicose veins of legs. A functional test of the valval apparatus finds out a failure hypodermic and communicative veins.



Fig. 2. Trophic complications of the varicose disease

At a chronic venous failure II B degree a subjective symptomatology is increased. Sensation of heaviness in legs is constant, fast fatigability, an edema and spasms of crus. The trophic changes of soft tissues with the phenomena of induration, hyperpigmentation, hemosiderosis, dermatitis, loss of hair, and induration of hypodermic tissue are characteristic also. Varicose veins are visible well. There is a failure hypodermic, communication and deep veins of the leg due to functional tests.

The clinical characteristic of a chronic venous failure III degree. For a chronic venous failure III degrees, which educes in a stage of the expressed clinical forms of decompensation, characteristic formation on a background above the described changes vasotrophic ulcers which are localized, mainly, in the inferior third of crus (Fig. 2).

According to standard schemes the plan of auxiliary inspection (laboratory and instrumental) at the patients with varicose veins of legs includes:

Functional tests for definition of a state of valves superficial, communication and deep veins of the inferior extremities.

Assays for definition of a state of valves of superficial veins. *Test Brodie – Troyanov – Trendelenburg* is carried out in position of the patient, laying on

a back (supine). The investigated extremity is lifted for emptying the varicose veins. A soft rubber tourniquet applies on the top third of femur or the spot of saphenofemoral junction squeezed by finger. The patient stands up. After decompression of the great saphenous vein, it is filled within some seconds by retrograde blood flow. This is treated as positive test which indicate the failure of the saphenofemoral junction and valves of the great saphenous vein trunk.

The Hakkenbruch's test. At the patient who stands in vertical position, press by fingers the venous trunk and ask to cough. At a failure of veins valves is present, especially saphenofemoral junction, the jerk of blood returning wave is passed to fingers which lay on vessel.

The tests for definition of communication veins valves state

Pratt's test (Fig. 3) is carried out in position of the patient, laying on a back. The investigated extremity is lifted for emptying the varicose veins. Then an elastic bandage applies on the extremity from toes to groin. A soft rubber garrot applies on the top third of femur. The patient stands up. The garrote is unwinding little by little from the top and, simultaneously, from an inguinal field applies another bandage so that between them there was an interspace 5–6 cm. Thus in places of a communication veins valves failure there is a venous distention. Sheynis' test (triple-garrot). Test carried out in position of the patient, laying on a back (supine). The soft rubber garrots apply on the top third of femur, above- and under- the knee joint.

The patient changes in vertical position. Filling of superficial veins between garrots testifies to presence of a communication veins valves failure in these segments. Thalman's test (modification Sheynis' test). A rubber garrot in length 2–3 m is used for performance this test. After emptying superficial veins garrots applies on the patient leg. Then the patient changes in vertical position and the garrot is taken out. Observing of filling of veins, a communication veins valves failure is assessed, as at Sheynis' test.

Assays for definition of deep veins valves state. Mayo – Pratt's test. Test is carried out in position of the patient, laying on a back. The soft rubber garrot applies on the top third of femur and leg is bandaged tightly from toes to the top third of femur. The patient is suggested to walk during 20–30 minutes. Appearance of a strong distend pain in an extremity is connected with disturbance

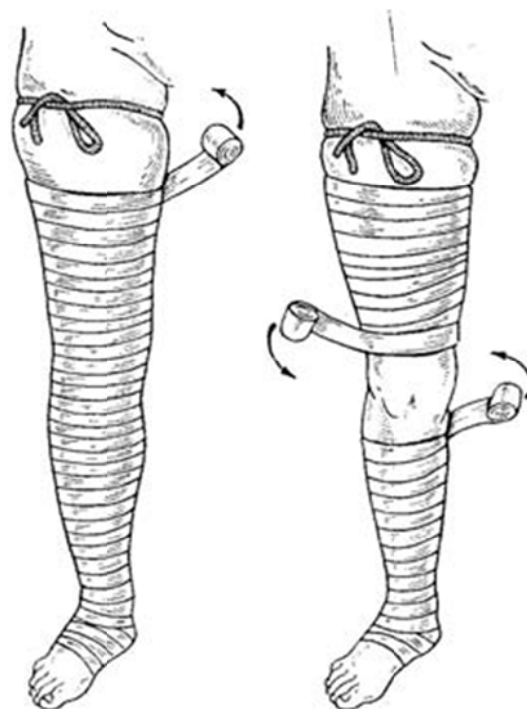


Fig. 3. Pratt's test



*Fig. 4. Test Delbet – Perthes
(«march test»)*

deep veins patency. Absence of unpleasant sensations testifies to good function of deep veins.

Test Delbet – Perthes («march test») (Fig. 4). The patient is in standing position. On the top third of femur a garrot is applied. Then the patient goes during 10–15 minutes. The saphenas are collapsed if there are deep and communication veins patency and their valves apparatus is safety.

Phlebography apply to finding-out of a state of deep and main veins and their valval apparatus, definition of features of a blood flow in veins and its direction in communication veins. At diseases of deep veins of the inferior extremities apply a distal vertical functional phlebography. For this purpose one of dorsal vein of foot or a great saphena arteriad of medial ankle

are punctured or denuded and catheterized. To prevention filling superficial veins contrast solution introduce after applying a tourniquet on the inferior third of shin. An x-ray table is placed under a 45–90° angle. The phlebography carries out in some stages: a shin, a femur during the muscle contraction at standing up on toes of foot. Intraosseous phlebography carries out through heel bone more often when intravenous phlebography is impossible (an oedema of foot, trophy ulcers). For finding-out of a state of a femoral vein and its valves, the phlebography carries out by subcutaneous puncture of the femoral vein. Contrast mass is injected holding of breath (Walsalva's test). At an insufficiency of valves there is retrograde blood flow as the result shunting the contrast solution in distal parts of the femoral vein, a popliteal vein, veins of the shin.

Differential diagnostics

The varicose veins of legs is carry out with diseases which have a similar clinical picture: congenital venous dysphasia, a femoral hernia. Differential diagnostics of varicose disease and congenital dysplasia of veins. The last represent capillary, cavernous or hemangiomas.

Differential diagnostics is based on the collecting of anamnestic data about disease exhibitions, especially at young age, however the basic method in recognition is the phlebography.

Differential diagnostics of varicose knot of groin and a femoral hernia is carrying out using the data of the patient inspection. The opportunity of manual reduction of hernia protrusion in the abdominal cavity in vertical position is

characteristic for a femoral hernia but it is impossible to make at presence of varicose knot of groin. Also the collecting of anamnesis data is important (were or not a strangulation of hernia, when the swelling was occurred). Also a phlebography is possible for differential diagnostic.

Substantiation and formulation of the clinical diagnosis at the patient (on classification of disease, presence of complications and an accompanying pathology basis).

1) The basic diagnosis – primary (secondary), mixed varicose of the great saphenous vein of dextral leg in the compensate stage without valves failure;

2) Complication – the acute thrombophlebitis;

3) Accompanying – a chronic venous failure I stage

Treatments of the patient. Today treatment of the varicose veins of legs it s possible to secure following methods of treatment: conservative, sclerosing and operative.

Conservative treatment of the varicose veins of legs is directed on the prevention of the subsequent development of disease or if there is a contraindication to application of other methods of treatment. Hard bandaging of the leg, wearing of convenient footwear is necessary to recommend patients. During a sleep – to give to legs the elevated position. It is recommended to limit intake of fluid, salt, to normalize weight. Prescribe drugs which improve microcirculation in tissues (Troxevasinum, Escin), venotonics (Detralex)), diuretic drugs, cardiac glycosides, a physiotherapy, exercise therapy, at not complicated forms of varicose disease the hydrotherapeutic procedures, especially swimming, are recommended.

Sclerotherapy: the introduction in varicose nodes sclerosing solutions (Varicocidum, vistarin, Trombovar) Drugs cause a destruction of intimae, the walls of vein adhere, obliterations of their lumen comes. The indication to sclerotherapy: for an obliteration of separate nodes or fields of the varicose veins in an initial stage of disease or negative Troyanov's test; for obliteration of separate nodes and small veins which have remained after excision of the cores; in the form of the combined treatment (sclerotherapy lateral branches of superficial veins before operation). Contraindication to carrying out sclerotherapy are thrombophlebitis, obliterating and purulent diseases.

Surgical treatment of the varicose veins of legs (Fig. 5). Surgical treatment of the varicose veins of legs is applied at: progress of subjective signs, a decompensation of varicose disease with a failure of valves, complications of varicose disease (an acute thrombophlebitis, a trophic ulcer, a bleeding from varicose nodes).

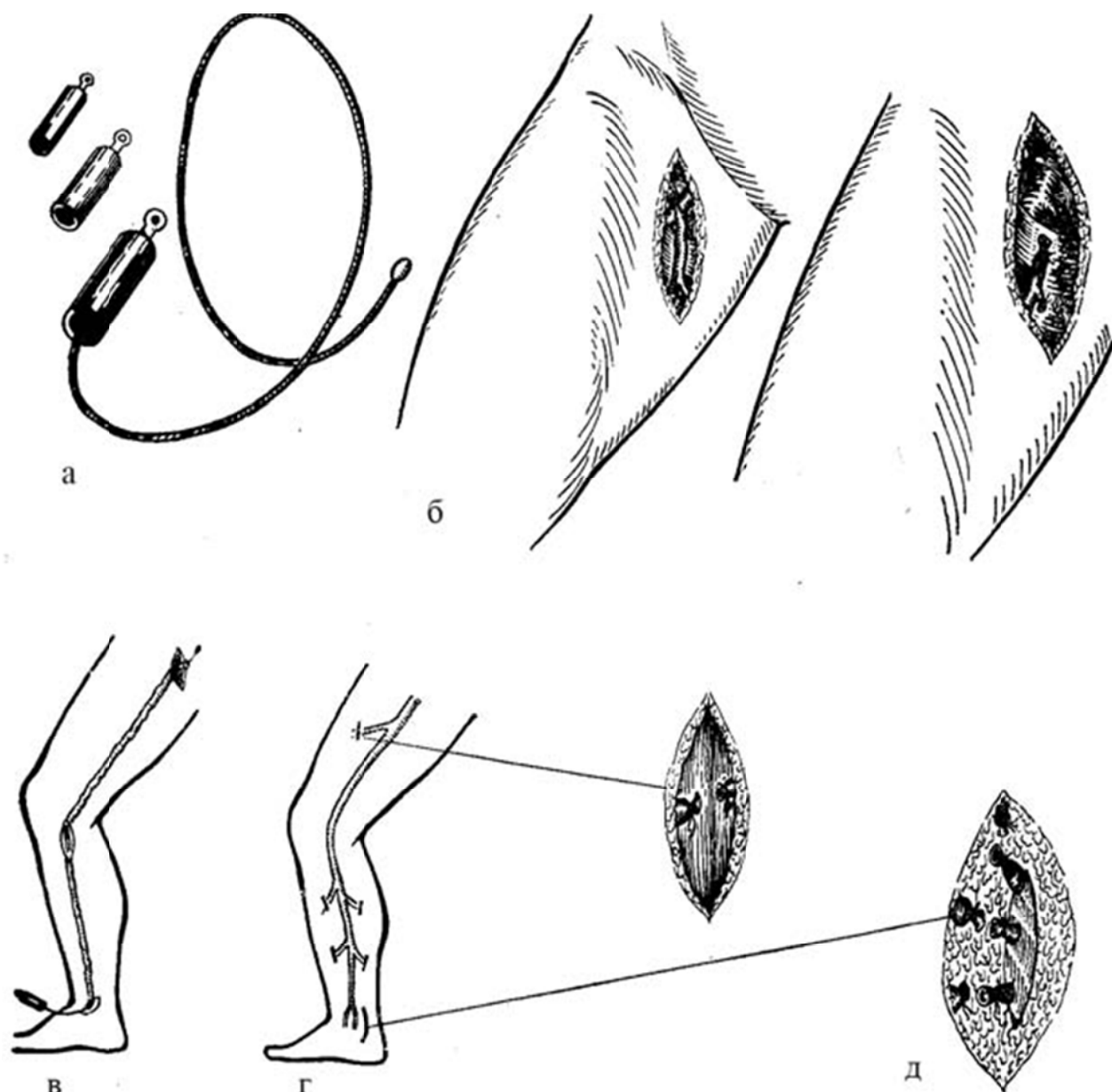


Fig. 5. Babcock-Narath operation:

a – Babcock's probe,

б – Troyanov-Trendelenburg's operation,

в – removing of the main trunk of the great saphenous vein by Babcock's probe,

г – removal of the narrative varices and varicose side branches by Narath,

д – Kokket's operation

Contraindications to surgical treatment can serve: an obstruction of deep veins; decompensate heart diseases, diseases of the liver and kidneys with the expressed disturbance of their function; an obesity III degrees. Dermatitis, eczemas concern to relative contraindications.

The saphenectomy operation sequence. Today there are combined methods for surgical treatment of varicose disease which consist of bonding several classical operations have been offered earlier as independent. As a rule, the operation begin from Troyanov-Trendelenburg 's operation. From the small cut of a skin

below inguinal (Poupart's) ligament separate the great saphenous vein, ligate it in the saphenofemoral junction and transect between two ligatures. Simultaneously ligate all veins which flow in to the great saphenous vein in this place. On the femur the great saphenous vein is deleted by Babcock's method. For this purpose, into a lumen of the crossed great saphenous vein introduce special olive-tipped probes which pass into distal direction. Then above an oliva of a probe make a small cut of a skin, transect a vein and its end fix by the ligature on a probe. Then a probe extract together with a vein. On the shin saphenas delete from separate small skin cuts which placed each other on 10 - 15 cm. This method has offered Narath. At the valves failure of femur and popliteal deep veins carry out extravasal methods elimination of valves failure which principle consists in formation extravasal spiral which narrows a vein in a place of the big valve, or sew with atraumatic suture by Kisner. After operation an active regimen is recommend for patients. Walking is allowed next day after operation. The patients are recommend bandaging an extremity by elastic rollers during 1,5–3 months for prophylaxis of postoperative complications.

The cause of varicose disease relapse after saphenectomy is veins which run into the great saphena in the region of the saphenofemoral junction. Therefore the ligation of the given veins during performance of primary operation is a great importance for the prevention of disease relapse.

The ligation of insufficiencies communication veins which are localized, more often, on inside surface of the shin is obligatory. At absence of trophic disorder the over fascia ligation of communication veins is validated. If there are trophic distresses of the skin and subcutaneous fats it is necessary to perform sub fascial ligation of the communication veins by Linton. Operation carry out from a cut on an internal surface of an shin in length 10–15 cm. Cutting a skin, a hypodermic fat, a crural fascia, find communication veins then ligation and cut them. Continuity of a deep fascia restore suturering by doubling its edges. If the indurations of skins and a hypodermic fat on the internal and external sides of shin are presence it is necessary to carry out subfascial ligation of communication veins through a section on a back surface of an shin (by Felder).

For prophylaxis of the varicose veins of legs wearing elastic stockings is recommended, bandaging of extremities, wearing convenient footwear on a low heel, to avoid a long standing and hard physical exercise, working in hot and wet rooms, normalization of weight.

CONTROL TESTS

1. Symptoms of varicose veins of the lower extremities are everything except:

- A) puffiness of the distal extremities towards the end of days
- B) leg cramps at night
- C) sharp pain in the calf muscles when walking
- D) trophic skin disorders in the lower third of the leg
- E) the presence of dilated veins

ANSWER: C

2. Varicose veins of the lower extremities manifests as:

- A) swelling
- B) hyperpigmentation of the skin of the legs
- C) formation of ulcers on the legs
- D) dermatitis
- E) all named

ANSWER: E

3. What is the rarest complication of primary varicose veins?

- A) Fibular vein thrombosis
- B) Thrombosis of the great saphenous vein
- C) PTFS
- D) Acute thrombophlebitis
- E) Chronic thrombophlebitis

ANSWER: A

4. With varicose veins of the lower extremities, everything is also often found except:

- A) deforming arthrosis
- B) hemorrhoids
- C) hallux valgus
- D) herniation tendency
- E) telangiectasia of the lower extremities

ANSWER: A

5. The most effective way to prevent progression of varicose veins is:

- A) limb elastic compression
- B) compliance with the rational regime of work and rest
- C) severe physical exertion
- D) complex therapy of vasocompression

E) courses of complex physiotherapeutic treatment

ANSWER: A

6. Pulsating varicose vein in a young adult is due to-

A) Arteriovenous fistula

B) Sapheno femoral incompetence

C) Deep vein thrombosis

D) Abdominal tumour

ANSWER: A

7. Which is NOT used in treatment of Superficial venous thrombosis

A) Immediate anticoagulation

B) Rest and elevation

C) Analgesics

D) Treat associated malignancy

ANSWER: A

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Електронне навчальне видання комбінованого використання
Можна використовувати в локальному та мережному режимі

Окле́й Денис Вікторович
Бичков Сергій Олександрович
Проні́н Василь Олександрович

ВАРИКОЗНЕ РОЗШИРЕННЯ ВЕН НИЖНІХ КІНЦІВОК

Методичні рекомендації
для здобувачів вищої медичної освіти з дисципліни «Хірургія»

(Англ. мовою)

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