

Disorders of peripheral veins

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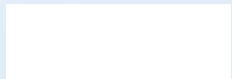
Disorders of venous system

- Deep venous system
- Superficial venous system (v.saphena magna, v.saphena parva, vv.communicantes)
- Vv.perforantes
(between deep and superficial venous system)

Venous thrombosis

Deep venous thrombosis

- Suddenly occurred occlusion of deep venous system
- Causes of thrombosis: Virchow
 - Rokitanski triad (venous wall impairment, blood stasis and hypercoagulation)



Deep venous thrombosis: hypercoagulation

- **primary** – inherited coagulation disorders
 - ATIII deficiency; protein C, protein S, plasminogen deficiency, APC resistance – Leiden's mutation of factor V
- **secondary** (malignancies, obesity, pregnancy, corticoid treatment, anti-baby pills treatment, nephrotic syndrom)

Deep venous thrombosis: blood stasis and wall impairment

Blood stasis

- Immobilisation
- surgery
- Fixation
- Hemiplegia
- Long travelling – plane, car

Wall impairment

- Direct - injury, burn, sepsis, surgery
- Indirect – cytokines during tissue injury

Risk of venous thrombosis:

- The risk ↑ with age, doubles every 10 years (after 40 years of age)
- Thrombosis after ortopedic surgery in 40-80% patients
- Padova score is calculated in internal patients

- malignancies ↑ risk 4,1-6,9x

- VT – provoked x unprovoked

- OR > 10: ortopedic surgery, trauma, puerperium (20x), thrombophilias in homozygot patients (až 80x)
- OR 2-9: hormonal treatment (2,9x), malignancies (4,1-6,9x), heart failure, pregnancy (5x), stroke, thrombophilias - heterozygots
- OR < 2: immobilization, long-term sitting

Deep venous thrombosis

- Swelling, pain, dilated veins, collaterals, colour changes

Clinically:

- Larger circumference of calf
 - Painful during palpation
 - Plantar sign
 - Homan 's sign znamení
 - Dilation and non-emptying of superficial veins
-

Diagnostics of deep venous thrombosis:

- History
- Physical examination
- **Wells' s criterias** – in medium or high susceptibility send the patient to vascular lab
- **Duplex ultrasound examination** with using of compression manœuvre of the whole extremity + triplex scan in pelvic area (98% sensitivity and specificity in proximal region, >90% in calf area)

Treatment of DVT – target:

- Prevention of progressive thrombus formation
- Prevention of pulmonary embolism
- Maximal recanalisation
- Recurrence of thrombosis

- **pharmacological**, endovascular, surgical, caval filters, supportive measures
- Physical activity – walk
- Compression stockings or garmets

Treatment of DVT

- 1/ **LMWH** 2xd in therapeutical doses + **warfarin** for 3-6-12month (LMWH only in oncological patients)
- 2/ NOAC: **rivaroxaban** (Xarelto) 15mg 2x daily for 3 weeks, then 20mg 1x daily for 3-6-12 month without LMWH, **dabigatran** (Pradaxa), **apixaban** (Eliquis)
- If the treatment is recommended for more than 1 year – NOAC should be replaced by warfarin

Deep vein thrombosis and pulmonary embolism prevention:

- Surgical patients – surgery, dehydration, sepsis, malignancies
- Orthopedical surgery – tournicets, venous wall injury
- Gynecology – pregnancy, delivery, pills
- Internal medicine – malignancies, heart failure, sepsis
- Patients with thrombosis/embolism in history
- ***Elastic stockings, early walking after surgery, exercising, pneumatical intermittent compression, LMWH***

Superficial venous thrombosis/thrombophlebitis

- **Inflammation and/or thrombosis of epifascial veins**
- Superficial flebitis
- Superficial venous thrombosis – non-varicous veins
- Varicoflebitis/varicothrombosis – affects varicous veins
- **Red, warm, painful stripe in the course of the vein**

Superficial venous thrombosis/thrombophlebitis

- Prevalence 3 – 11%
- Women 4-6x more frequent
- Varicoflebitis in 10-20% people with varices

Risk factors:

- Thrombophilias (50% SVT of non-varicous veins)
- Malignancy
- Immobilization, trauma
- Hormonal treatment

Clinical presentation and treatment

Patient complaints:

- Pain, swelling

Clinical findings:

- Noncollapsible, tough, palpable, red, hot, swollen strip in superficial vein

DG:

- DUS

Treatment:

- Depends on amount and localization of clots
- LMWH for 6 weeks in big SVT of great saphenous vein, clots in sapheno-femoral junction
- Surgical treatment with clot elimination in big varicophlebitis
- Compressive stockings/garmets, physical activity, NSAID

Varices

Varices

- Permanently dilated and elongated superficial vein accompanied by chronic changes of venous wall
- Primary – idiopathic, secondary
- Lower extremities: 11-36% populace
- **Pathogenesis** – venous valves insufficiency, abnormalities in venous wall composition and venous hypertension
- **Risk factors**: genetic, obesity, pregnancy, smoking, hormonal treatment

Varices

- **Intradermal teleangiectasia** – affects very small veins – pictures of fan „corona phlebectatica“
- **Reticular varices** subdermal location of veins
- **Axial venous varices** – VSM, VSP and its branches - could cause venous insufficiency

Symptomatology:

- Feelings of weight, pain, fatigue, night cramps
- Edema, pigmentation, skin induration

Treatment of varices

- Surgical
- Endovascular
- Sclerotherapy
- Conservative treatment – compression stockings, venotonics, physical activity

Chronic venous insufficiency

Chronic venous insufficiency

- = chronic failure of venous function in lower extremities causing **blood stasis** and **venous hypertension** – many causes
- Primary varices
- Postthrombotic syndrome
- Venous compression
- Abnormalities of venous wall and valves

REFLUX
OBSTRUCTION

Non-vascular causes:
Disturbances
of muscle pump!!

Venous hypertension

- Higher pressure is transferred into microcirculation
- Capillaries dilation
- Increased permeability of membrane
- Fluid + fibrin in tissues
- Leukocyte stagnation
- Release of cytokines, proteolytic enzymes + ROS
- Tissue hypoxia
- = **skin changes**

Chronic venous insufficiency

- **Clinical presentation:**
- Feelings of weight, pain, fatigue, night cramps
- Edema, pigmentation, skin induration, skin ulceration – calf

- **Dg:** DUS

- Treatment: activity, stockings, venotonics

Lymphatic system

Lymphangoitis

Lymphedema

Lymphangoitis

- = inflammation of lymphatic vessels, the result of infection propagation
- Strip form - lymphangoitis
- Superficial net form
- Deep organ form

- Streptococcus pyogenes

Lymphedema

- High-protein swelling
- Lymphatic system dysfunction
- Tough, painless edema
- Pale cold skin
- Negative pitting test
- Edema doesn't vanish after leg elevation
- Stemmer's sign positive

Lymphedema

- A/ inheritide - primary
 - Lymphatic vessel disturbances
- B/ acquired – secondary
 - Obstruction of lymyphatic vessels/nodes
 - Malignancies, injury, inflammation, surgery, radiotherapy

Lymphedema

- History – primary x secondary
- **Physical examination** – Stemmer's sign positive, pitting test negative
- **Scintigraphy of lymphatic vessels**
- **UZ**

Treatment

- **Lymphatic drenaige**

- Manual
- Instrumental
- **Not in:**
 - Malignancies, heart failure, acute bacterial infection, akute venous thrombosis

- **Treatment**

- Leg elevation
- Elastic compression III.C.C - multilayer
- Weight loss
- Exercising the muscle pupm