

Surgery–Vascular Assessment

Hx and Ex of “vascular symptom”

A. Overview:

- **Intermittent Claudication:** Pain in one or both calves, thighs or buttocks during walking more than a certain distance (the claudication distance).
- **Critical limb ischemia (Rest pain):** Continuous unremitting pain caused by severe ischemia.
- **Acute limb ischemia:** sever sudden abrupt leg pain with inability to walk, the pain that increases in severity with every hour and another, it results from sudden obstruction of the arterial system.
- **Varicose vein:** dilated, tortuous vein

Arterial diseases usually doesn't cause edema. Edema only caused by veins and limaphytics diseases.

Venous swelling usually painful but lymphatic pathology swelling is painless

B. Differential diagnosis:

DDx	What support this diagnosis?
“Pain”	
Chronic limb ischemia Intermittent Claudication Most common.	Risk factors: <ul style="list-style-type: none"> • Modifiable: Cigarette smoking, hypertension, diabetes and hypercholesterolaemia. • Non modifiable: Male gender and old age. Typical Symptoms: Pain during walking more than a certain distance and relived by rest. Complication: Critical limb ischemia, Ulcer, Gangrene.
Critical limb ischemia (Rest pain +/- tissue loss)	Risk factors: same as chronic limb ischemia. Typical Symptoms: pain present at rest throughout the day and the night usually experienced in the most distal part of the limb, namely the toes and forefoot. Complication: Ulcer(tissue loss) , Gangrene.
Acute limb ischemia (6Ps)	Risk factors: cigarette smoking, hypertension, diabetes and hypercholesterolaemia, male gender and old age. Typical Symptoms: sever SUDDEN onset of diffuse and poorly localized leg pain becomes more sever every hour and another. Complication: Ulcer(tissue loss) , Gangrene.

Questions to ask the patient

A. With intermittent claudication or critical limb ischemia. (Arterial).

Questions	What you think about ... !
Pain * The patient main complain is pain so let's try to apply (SOCRATES)	
Site	
Do you have pain? Where's it?	To know which muscles are involved [Calf * Most common (superficial femoral artery is affected), thigh & gluteal region (Iliac artery is affected)].
Unilateral or bilateral?	
Which part of the limb is painful?	
Onset	
Do you get the pain on walking or exercise or is it sudden pain?	Pains that begin when at rest or immediately the patient stands up, and that do not abate with rest are not claudication pains. It's more likely to be critical limb ischemia.
Is the pain getting worse or it's improving?	Acute limb ischemia pain becomes more severe over each hour.
Any history of trauma?	
Character	
Can you describe the pain?	Intermittent claudication begins as ache in the muscles of the leg, which then becomes a cramp and then stops them walking any further.
<u>NO</u> radiation	
Associations	
Is there any swelling?	Edema usually is not there in arterial problem.
Time	
Time course of the pain + time to recover?	
Exacerbating/Relieving factors	
What aggravates and relieves the pain?	Intermittent claudication aggravated by movement, walking and relieved by rest. Rest pain relieved by putting the leg below the level of the heart
Have you tried any analgesic drugs that give relief?	
Severity	
Can you please scale the pain out of 10 (0 is no pain and 10 is the most sever)?	
How far can you walk before the pain begins?	Claudication distance.
Is the pain so bad that you have to stop walking?	

When you stop walking how long does the pain take to wear off?	
Can the same distance be walked again?	
Is there any pain in the limb at rest?	** Its presence signifies the onset of critical limb ischaemia.
Does the pain interfere with sleep?	
Can you walk through pain?	
Limitation of movement?	
Does the pain affects your life style?	
Only if you suspect acute limb ischemia, don't forget to ask about the 6Ps	
Pain	
Pallor (Color of legs) Are there color changes in the skin, particularly in response to a cold environment?	
Paraesthesiae (Numbness in leg) Do you experience any tingling or numbness in the limb?	
Poikilothermia (Cold legs), Are the extremities of the limbs cold?	
Pulselessness , and the limb feels	This is a sign
Paralysis.	
Risk factors of atherosclerosis ***	
Smoking DM HTN Hyperchlesterolaemia Sedentary life style Previous MI or angina Stroke or TIA	
Others	
Past medical history	The diseased that mentioned with the risk factors and ask specifically about cardiac or vascular diseases.
Past surgical history	
Blood transfusion	
Medication history and Allergy	
Family history of ischemic heart disease	Arterial disease is often familial, so it is important to ascertain the cause of death of parents and siblings and whether they had any symptoms of vascular disease (Heart, brain, legs clots).

Review of symptoms related to the system of interest.

Symptoms which indicate the presence of atherosclerosis elsewhere. E.g, chest pains, episodes of blurred vision.

Questions to ask the patient with Varicose vein

B. With Varicose vein (Case of Female, multiparous, swelling increases with long standing and decrease by rest)

Questions	What you think about ... !
Pain if present * (SOCRATES)	
Site	
Do you have pain? Where's it? Unilateral or bilateral? Which part of the limb is painful?	
Onset	
How did the pain started?	
Is the pain getting worse or it's improving?	It gets worse throughout the day especially if the patient is standing up for prolonged periods.
Any history of trauma?	
Character	
Can you describe the pain?	It's usually like heaviness due to congestion.
NO radiation	
Associations	
Is there any swelling? Night cramps itching	
Time	
Time course of the pain + time to recover?	
Exacerbating/Relieving factors	
What aggravates and relieves the pain?	Aggravated by long standing and relieved by lying down for 15 or 30 minutes or by wearing compression hosiery.
Severity	
Can you please scale the pain out of 10 (0 is no pain and 10 is the most sever)? Is there any pain in the limb at rest? Does the pain affect your life style? Swelling (for both veins and lymph) Where is it? Unilateral or bilateral? When did you first notice it? What draw your attention to it? Does it hurt? Does it change since you notice it? The level (at the ankle or knee or the groin?) The pattern (distal to proximal or vise versa)? Do you have any other swelling or in the past? Risk factors for lymphatics (Surgery with lymph dissection, tumor invasion,...)	
Risk factors	

Long standing (occupation)

Pregnancy

Obesity

Sedentary life style

Others

Past surgical history * Important in case of swelling

Physical Examination

Most probably the case will be chronic limb ischemia and they will ask you to examine the lower limbs.

A. Start the examination with: (I should start with)

WIPE

- **W**ash your hands.
- **I**ntroduce yourself to the patient.
- **P**ositioning of the patient (Supine) and his/her **P**rivacy.
- **E**xposure: For lower limbs expose from umbilicus downward to the toes, for upper limbs expose up to the upper chest above the nipples. * I'll expose the areas that I need*

Inspection: (stand at the end of the bed)

1. Mention that the patient has both limbs with no missing toes.
2. **Nails** (thickened in chronic ischemia, thinning in acute ischemia, discoloration)
3. Any trophic changes (**Hair loss, muscle atrophy** & loss of subcutaneous fat (**shining skin** like in elderly) specially over bones (tibia).
4. Inflammation (**Redness**, swelling decrease movement).
5. **Skin pigmentation/** Discoloration (ischemic/ hemosiderin staining/ cellulitis/cyanosis)
6. We should **check between the toes** => to see if there's any ulcers or infections.
7. **Ulcers/ gangrene/ Scars.** You should also lift the leg to see if there's an ulcer in the posterior side.
8. Any **swelling** or edema (If there's swelling mention its size)
9. **Abscess** in pressure areas(heels, between toes)
10. **Vascular angle (Buerger test):** To check if the vessels deliver the blood without problems. *It takes time you may leave it to the end*
 - Elevate the legs and watch the color of the toes and foot. In a limb with a normal circulation the toes stay pink, even when the limb is raised by 90°. In an ischaemic leg, elevation to 15° or 30° for 30 to 60 sec. may cause pallor. (Buerger's angle, is the angle to which the leg has to be raised before it becomes white), the ischaemic foot goes white while the normal foot remains pink. If it becomes white we call it cadaveric pallor on elevation).

- Then place the legs down at 90° over the edge of the bed, a red purple foot indicates severe ischemia. (inform the patient that you're going to swing him in order to put his legs down). If it becomes red we call it dependent rubor.

11. **Venous cutting:** in the ischemic foot the veins collapse and sink below the skin (it looks like pale to blue painted stream on the skin)

12. **For varicose veins (while the patient is standing examine both limbs from front and back).** If the case arterial problem, you don't have to do it.

Palpitation: Ask for pain and warm your hands.

1. **Tenderness** (Make sure to see the patient face)
2. **Temperature** (Check it with the dorsum of your hand, don't forget to compare it with the other side starting from the normal side).
3. Check for **edema**, press both legs from medial malleolus upward, (press above bony prominence).

4. **Capillary refill time** (press over the tip of the nail or the pulp of a toe for about 3-5 Sec then stop and observe the time taken for the blanched area to turn pink again, normally 2-3 sec, it tells you about the circulation in that finger).



Common popliteal pulse

5. **Check the pulses:** There're 4 arterial pulses which are routinely felt in the lower limb, from proximal to distal:
 - **Common femoral artery** [Halfway between the symphysis pubis and the anterior sup. iliac spine (Mid inguinal point below the inguinal ligament)]. We feel pulses by pressing the artery against bone and here it's felt against the head of the femur. **It's a continuation of external iliac artery.**
 - **Popliteal artery** [flex the knee slightly to loosen the fascia then try to feel it laterally in the popliteal fossa, it isn't easily felt]. As seen in pic.
 - **Posterior tibial artery** [lies 1/3 the way between medial malleolus and the tip of the heel]. **It's a continuation of popliteal artery.**
 - **Dorsalis pedis artery** [between the 1st and 2nd metatarsal bones, lateral to extensor hallucis longus tendon]. **It's a continuation of anterior tibial artery.**
6. **Venous filling** (place two fingers on a vein, the 1st one to occlude the vein while with the 2nd try to empty the vein from blood, then remove the 2nd and look for the direction of the filling and the time). (Not imp.)
7. In case of lymphadema do Stemmer's sign (is an inability to pinch the skin together on the dorsal surface of the second toe), this indicates the presence of

lymphoedema and is a consequence of secondary thickening and hyperkeratosis of the skin. (Not imp.)

NO Percussion

Auscultation:

- Auscultate for any bruits over the common/superficial femoral and popliteal arteries) using the bell. (Causes of bruit are: Post stenotic dilatation or aneurysmal dilatation)

Compare both limbs
Examine the leg from behind

*In case of varicose, describe the site+ size in small/great saphenous vein (medial is great, lateral is small).

** If the OSCE question didn't specify the lower limb do the following:

- I'll assess upper limb vascularity, check the radial pulse then comment only if it's present and clear or not then if it's not clear go proximally to the brachial artery then to the axillary artery.
- Examine the neck, see the common carotid artery, palpate it and auscultate it in both sides.
- Examine the Abdominal aortic artery, palpate & auscultate to rule out abdominal aortic aneurysm.

B. End the examination with: (to complete my Ex)

- Full cardiovascular examination
- Neurological examination
- Examination of the motor and skeletal systems

Interpretation of the abnormal findings

Abnormality	Indicates
Trophic changes	Ischemia
In burger test if the toes become white in angle of less than 20°	Sever ischemia
Retarded capillary re-filling	
Radio-femoral delay or radio-radial delay	Coartication of aorta
Popliteal artery pulse if felt easily	Popliteal aneurysm
Delayed venous filling	Ischemia since there's no sufficient supply, there won't be proper venous filling.
Bruits	Turbulent flow beyond a stenosis or an irregularity in the artery wall (aneurysm).

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