**Subject:** Vascular surgery

**Course coordinator:** dr hab. Arkadiusz Migdalski, prof. UMK, 602 690 989, armigos@wp.pl

**Year:** IV
**Group:** ….
**Faculty:** Medicine (English Division)
**Form of classes:** **on-site course** (seminars prepared by students),

**The dates of classes:** ………………………………….

**Assistant supervising the group**: ………………………………………….

1. A representative of a student group sends a list of students to armigos@wp.pl
2. The group supervisor sends the course schedule to the group representative.
3. Students are expected to repeat the anatomy of the vascular system. The assistant can ask questions about the anatomy during the seminar.
4. The course starts at 9:00 am
5. PPT presentations (up to 25 slides) are prepared by students (in 2-3-person subgroups). Each student in the subgroup should present part of the presentation.
6. The assistant discusses the content of the presentation, corrects it and assesses the quality of the presentation (grade 2-5, grade required to pass: 3)
7. Students are assigned to assistants for exercises with the patient and final oral exam (two questions and one clinical case from the list), which will take place on the last day of the course.
8. The final grade is the arithmetic average of two grades: ppt seminar (including questions on the anatomy of the vascular system) / final oral exam. Only students who receive grades ≥ 3 will be allowed to take the final oral exam.
9. Students who have received grade 2 have a retake exam conducted by the Head of the course.
10. Literature: Current ESVS recommendations for: limb ischemia, chronic venous disease, carotid and vertebral artery disease, abdominal aortic aneurysm <https://www.esvs.org/journal/guidelines/>.

Vascular Surgery: Cases, Questions and Commentaries by [George Geroulakos](https://www.amazon.com/s/ref%3Drdr_ext_aut?_encoding=UTF8&index=books&field-author=George%20Geroulakos), [Bauer Sumpio](https://www.amazon.com/s/ref%3Drdr_ext_aut?_encoding=UTF8&index=books&field-author=Bauer%20Sumpio), Springer; 4th (2018) or newer.

**Presentations ppt / Discussion**

**Day one** 9:00 (on-site course)

**Presentation:** Acute limb ischemia (ALI)

(3-4 students)

Issues to be discussed:

- diagnosis of a limb at risk of loss,

- differential diagnosis of acute limb ischemia

- surgical and endovascular management of ALI

- diagnostic methods useful in qualifying for surgical/ endovascular treatment

**Presentation:** Chronic limb-threatening ischemia (CLTI)

(3-4 students)

Issues to be discussed:

- differential diagnosis of chronic limb-threatening ischemia

- surgical and endovascular management of CLTI

- diagnostic methods useful in qualifying for surgical/ endovascular treatment

- patient with diabetic foot

- level of amputation

**Day two** 9:00 (on-site course)

**Presentation:** Venous thromboembolism

(3-4 students)

 **Presentation:** Chronic venous disease

(3-4 students)

Issues to be discussed:

 - acute proximal dvt with a risk of limb loss (invasive treatment) - a case of dvt for conservative management - a case of thrombosis for secondary prophylaxis - invasive treatment of varicose veins of lower extremities - endovascular treatment of post-thrombotic syndrome - management of venous ulceration

**Day three** 9:00 (on-site course)

**Presentation:** Diagnostics and treatment of aortic aneurysms

(3-4 students)

Issues to be discussed:

- follow-up of patients with aneurysm <5.5 cm

- management ruptured AAA

- qualification for surgical or endovascular treatment

**Presentation:** Surgical diseases of the aortic arch branches

(3-4 students)

Issues to be discussed:

- conservative treatment of a patient with carotid stenosis

- patient with symptomatic stenosis of the internal carotid artery

- patient with asymptomatic stenosis of the internal carotid artery carotid stenosis

- qualification for major cardiovascular surgery of patient with severe carotid stenosis

- qualification for surgical and endovascular treatment

- diagnostics and treatment of Subclavian Steal Syndrome

- endovascular and surgical treatment the brachiocephalic trunk stenosis

**Day four** 9:00 (on-site course)

(exercises: Vascular Surgery Department)

- Vascular Surgery Ambulatory Clinic - Operating Theater - Vascular Surgery Department

**Final oral exam**, subgroups - according to the assignment to assistants (students fix the time of the exam with the assistant individually)

**Exercises / Final oral exam:**

dr P. Wierzchowski 601975398 pawel.wierzchowski@gmail.com

dr P. Brazis 601074874 mpbrazis@wp.pl

dr W. Jaraczewski 602506544 jaraczewskiw@gmail.com

dr K. Kobziakowski 888088159 klaudiusz1989@gmail.com

dr K. Kwaśniewski 607450070 kf.kwasniewski@gmail.com dr K. Stadnik-Zawalska 784525050 katarzyna.stadnik95@wp.pl

**Attendance list**-group ….. , IV year, vasc surg ED

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| **No.** | **Student's surname and first name,e-mail,phone number,** | Sem. 1 | Sem. 2 | Sem. 3 | Sem. 4 | Sem. 5 | Sem. 6 | Exercises/Clinical cases | Final oral exam | Assistant(exercises, exam) |
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**Student assessment card - GROUP …… – 4th year ED**

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| **No.** | Student's surname and first name,e-mail,phone number, | Index No.Assistant | **A.****Persentation ppt** | **B.****Final oral exam** | **Final score, arithmetic average (A+B)** |
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**Clinical cases**

**Case 1. AOPWA**

A 65-year-old patient reports to the Vascular Surgery Outpatient Clinic due to lower limb pain. Symptoms have been around for about a year and have increased over the past month. The pain appears mainly when walking, occasionally at night. It’s disappearing after resting and sitting. The effort intensifies the discomfort. The patient is able to walk about 150-200m without pain.

Medical history: ischemic heart disease, a myocardial infarction a year ago, hypertension, varicose veins of the lower extremities and long-term nicotinism. He takes Acard 75mg 1x1tabl and Amlozek 5mg 1x1 tabl in the case of elevated pressure, but irregularly.

Physical examination reveals edema of the left lower limb and varicose veins, delayed capillary return in both lower extremities, atrophy of hair on the shins; pulse on the arteries of the lower extremities is palpable in the groin and hardly palpable in the popliteal arteries, no pulse is felt on the anterior and posterior tibial arteries.

Issues:

1. Suggest a preliminary diagnosis and differentiate the disease entity from the diagnosis
2. Present the patient the scope of tests you want to perform during the current and next visits
3. Set a time frame for further treatment
4. Plan pharmacotherapy appropriate for this case and present an alternative in case of intolerance or ineffectiveness of the original treatment.

**Case 2. AOPWB**

A 71-year-old patient reports to the Vascular Surgery Outpatient Clinic due to lower limb pain. Symptoms have increased significantly in the last two weeks before the visit. The distance of intermittent claudication is about 50-70 m but it is not very reliable due to significant infirmity of the patient caused by stroke and left limb paresis.

Medical history: diabetes mellitus t. 2, hypertension.

Physical examination reveals minor wounds on the shin and ulceration in the left heel area. There is no pulse in the groin and peripheral arteries.

Issues:

1. Suggest a preliminary diagnosis and differentiate the disease entity from the diagnosis.
2. Conduct a discussion on non-invasive diagnostics for the presented case, including the expected results and justification.
3. Conduct a discussion on invasive diagnostics for the presented case including the expected results and justification

**Case 3. URPW**

A 50-year-old patient was brought to the emergency medicine ward; after injury in the workplace, with a large hematoma on the thigh and an open wound on the front surface of the left thigh. In physical examination, you find that there is no pulse on the arteries peripherally to the thigh wound. The limb is pale blue. In duplex ultrasound, you notice a significant impairment of arterial flow on the popliteal artery and shin arteries. Within the thigh itself, the examination is difficult due to the pressure bandage applied.

Issues:

1. Suggest diagnostics enabling the correct diagnosis to be made.

2. Present therapeutic options for the described case depending on the type of vascular damage.

3. Conduct a brief discussion on long-term prognosis depending on the clinical situation and surgery.

**Case 4. LIPW**

A 63-year-old patient reported to the Vascular Surgery Outpatient Clinic with advanced lower limb edema. Until now treated by a primary care physician.

Medical history: diabetes, chronic venous disease, and episodes of erysipelas in the past.

In the physical examination you do not find any signs of limb ischemia, but due to swelling, the pulse rate and the ankle brachial index cannot be examined.

Issues:

1. Suggest diagnostic procedures in the presented case
2. Present therapeutic options in the field of pharmacotherapy and physical therapy in the presented case.

**Case 5. AOBFA**

A 62-year-old patient, under the care of the Vascular Surgery Outpatient Clinic because of the chronic ischaemia of the left lower limb, reported a reduction in the claudication distance to 100m. Based on the angio-CT scans, the patient was qualified for percutaneous angioplasty of the left superficial femoral artery. Comorbidities: diabetes mellitus type 2, persistent atrial fibrillation, hyperthyroidism. Drugs: metformin 1000mg 3x1tabl, thiamazole 20mg 1x1, warfarin 5mg 1x1.

Issues to study this case:

1. Suggest further management with this patient

2. Conduct a discussion on the diagnosis of comorbidities for the presented case, including contraindications for invasive treatment.

3. Conduct a discussion on medications for the presented case, including contraindications for invasive treatment.

**Case 6. DMBF**

A 67-year-old patient reports to the Vascular Surgery Outpatient Clinic because of the necrosis of the toe of the left foot. The patient reports that about 1 month ago he had a nail plate removed at the General Surgery Outpatient Clinic. There has been no improvement in healing since. Necrosis and pain appeared in this area. From 3 days it’s occrred reddness of the big toe and part of the forefoot. A fever has appeared for 2 days. The patient reports that blood glucose concentration are above 250mg%. The patient reports that there have been pains in the calfs while walking, occasionally during night rest. They disappear after resting and sitting. Earlier, the patient was able to walk quickly around 200-300m without pain. Comorbidities: ischemic heart disease, myocardial infarction 3 years ago, hypertension, diabetes mellitus type 2. Physical examination reveals swelling of the left foot with redness of the forefoot and focal necrosis of the left foot with visible leakage of turbid fluid, delayed capillary return on the skin of the left foot, hair loss on the calfs, pulse on the arteries of the lower extremities palpable clearly in the groin and poorly sensed in the popliteal arterie. There was no pulse on the back of the foot and behind the medial ankle.

Issues to study this case:

1. Suggest a preliminary diagnosis and differential diagnosis

2. Conduct a discussion on non-invasive diagnostics tools for the presented case, including the expected results with shortly explanation

3. Conduct a discussion on invasive diagnostics tools for the presented case, including the expected results with shortly explanation

4. Suggest possible treatment solutions for the presented case.

**Case 7. AOBFB**

A 92-year-old patient was brought by medical transport to the Emergency Department with a referral from GP diagnosed with " right lower limb critical ischaemia". Patient is with poor contact. An interview is difficult to gather. In physical examination: lower limbs in a forced position - contractures in the hip and knee joints, extensive ulceration of the right calf and right foot. Pulse felt on both sides only on femoral arteries. In addition, a pressure ulcer in the area of ​​sciatic tumors and the sacral region. In the study of body temperature 37.8 C degrees. After insertion of the Foley catheter into the bladder, a trace of dark yellow urine was obtained.

Issues to study this case:

1. Suggest a preliminary diagnosis and differential diagnosis

2. Conduct a discussion on non-invasive diagnostics tools for the presented case, including the expected results with shortly explanation

3. Conduct a discussion on invasive diagnostics tools for the presented case, including the expected results with shortly explanation

4. Suggest possible treatment solutions for the presented case.

**Case 8. AOBFC**

A 58-year-old patient reported to the hospital because of right lower limb pain. The patient reports severe right foot pain for 2 months. The patient reports that half a year ago he had a right femoro-popliteal by-pass implantation. On day 1 after surgery he was re-operated - bypass thrombectomy and intraoperative arteriography with anterior tibial artery angioplasty (the only one visible artery in arteriography). The next day he had a fasciotomy. His foot had been out of order since then. The patient was moving with the help of elbow crutches. The patient reports that he took the prescribed medication for only one month. Currently, he does not take any medications except painkillers. The patient reports that he is still smoking. The patient denies other diseases. In the physical examination, the temperature of lower limbs is asymmetrical, the right foot is paralyzed, the skin is cyanosed from the knee to the periphery. Pulse is felt only in the groin.

Issues to study this case:

1. Suggest a preliminary diagnosis and differential diagnosis

2. Conduct a discussion on non-invasive diagnostics tools for the presented case, including the expected results with shortly explanation

3. Conduct a discussion on invasive diagnostics tools for the presented case, including the expected results with shortly explanation

4. Suggest possible treatment solutions for the presented case.

**Case 9. VEPBA**

**History**

A man 40 years old, carpenter by trade, came to Outpatient Clinic with edema, pain, tingling and heaviness of the lower limb. Symptoms usually apear in the afternoon and worse at the end of the day. Complaints improve with leg elevation and in the morning.

**Examination**

Venous varicosities on territory of great saphenous vein (GSV)

**Questions**

1.What is the diagnosis?

2. What investigation should be performed?

3. What would be appropriate treatment (conservative or surgery)?

**Case 10. VEPBB**

**History**

A 32 years-old women comes to Outpatients Clinic complaining of edema and pain during walking of left leg. Her past medical history is notable for a deep venous thrombosis treated with LWMH and oral anticoagulant, two pregnancies, periodically oral contraceptives. Currently without any medications. She weared compression stockings of second compression degree. Nowadays she is leading active lifestyle, when wearing compression stockings feels uncomfortable and completely stopped such therapy.

**Examination**

Left calf edema

Dilated subcutaneous veins of lower limb and pubic region

In the gaiter region (lower 1/3 of the calf) intense hyperpigmentation and brawny induration

**Investigations**

Duplex scanning:

Post-thrombotic changes in common femoral, femoral and popliteal veins. Occlusion of common iliac and external iliac veins.

Massive reflux in femoral and popliteal veins.

Great saphenous and small saphenius veins dilated but competent

Cocketts perforators dilated

**Questions**

1.What is the diagnosis?

2. What would be appropriate invasive treatment ?

3. What would be correct management after invasive treatment ?

**Case 11. VEPBC**

**History**

A 70 years-old women comes due to open wound located above middle ankle.

She suffers from degenerative arthritis and uses walking stick. Past medical history is notable for hypertension and atrial fibrillation. Medication consists of simvastatin, warfin and bisoprolol.

**Examination**

In the gaiter region (lower 1/3 of the calf) intense hyperpigmentation, brawny induration and open ulcer (5x10 cm). Varicose veins on territory of great saphenous vein (GSV).

**Questions**

1.What is the diagnosis?

2. How would you investigate this patient?

3. What would be appropriate treatment?

**Case 12. DVLWA**

A 67-year-old female patient came to the ER, referred by a family doctor, with a significant swelling of the right lower limb, which appeared a few days ago and has grown bigger since yesterday. Today there was intensification of pain and appearance of discoloration of the lower limb. Patient reports that she is being treated for hypertension and hypothyroidism. Two weeks ago she was diagnosed with an abnormal fasting blood glucose by her family doctor. A few years ago she underwent right mastectomy because of cancer. Currently arterial pressure 154/92, tachycardia 110 / min, saturation 98%. Lower right limb with massive swelling. The skin on the limb is tense, tender, marbled with cyanotic changes. In the ultrasound performed: the right common femoral and popliteal veins incompressible, filled with thrombi, which extends to the right common iliac vein.

Please:
Suggest initial diagnosis and compare it with other probable causes.
Conduct a discussion in the scope of diagnostics for the presented case with the range of expected results.
Suggest possible treatment solutions for the presented case.

**Case 13. DVLWB**

A 32-year-old female patient was referred to the ER by a family doctor, because of a "sticking" type of discomfort in the left foot and slight swelling, lasting around 5 days. The patient reports that she is not treated for any chronic diseases. When asked about the use of hormonal contraception, she claims that she has not used it for over 4 months, because she is trying for a child. She also reports that she works as a field representative of the company, which is associated with daily car journeys. She is a physically active person, because in her spare time she practices jogging and cycling. Patient reports that she has not recently suffered from a lower limb injury. The ultrasound examination of the left lower limb showed thin-walled and compression-prone femoral, popliteal, large and small saphenous veins. However, fresh thrombi were visible within the intramuscular veins of the left shin.

Please:
Suggest initial diagnosis and compare it with other probable causes.
Conduct a discussion in the scope of diagnostics for the presented case with the range of expected results.
Suggest possible treatment solutions for the presented case.

**Case 14. DVLWC**

A 43-year-old patient was referred to ER by a family doctor due to swelling of the lower right limb below the knee. He claims that the swelling of the lower limb appeared about 4 days ago. He says that he often travels and recently took a flight a week ago, which lasted for about ten hours. Patient underwent deep vein thrombosis of the right lower limb about 10 years ago, which occurred after immobilization of the limb with a plaster dressing, due to a fracture of the fibula. Fracture occurred as a result of an injury he suffered, while playing football. Since then, he has been using compression therapy for the right lower limb (2nd degree), and he has not been taking any medications for about 8 years (previously he received the vitamin K antagonist). Examination showed that the lower limb was discreetly warmer below knee with a slight swelling of the shin and feet. The ultrasound examination found a thin-walled and compression-prone right femoral vein. The right popliteal vein was largely recanalized, however, with features of thrombosis (recent and old lesions).

Please:
Suggest initial diagnosis and compare it with other probable causes.
Conduct a discussion in the scope of diagnostics for the presented case with the range of expected results.
Suggest possible treatment solutions for the presented case.

**Case 15. ICAMA**

A 65-year-old male patient was referred to the Vascular Surgery Ambulatory Clinic for a standard follow-up visit. In the outpatient clinic he is monitored for abdominal aortic aneurysm (current diameter 43 mm). However, the patient is currently planned for cardiac surgery (CABG). During preparation for the procedure, bilateral carotid artery stenosis (RICA 70%, LICA 80%) was found in the Doppler ultrasound. The patient was referred to vascular surgeon to determine what invasive procedure should be performed first. The patient does not state that he was ever hospitalized in the neurology ward. He had no speech disorder or significant weakness in the upper and lower extremities. Three months ago he was hospitalized in the ophthalmology ward due to right-sided blinding (retinal artery embolism). During hospitalization in the neurology department bilateral carotid artery stenosis was described in the duplex scan image, although at a much lower intensity (RICA 40%, LICA 70%). The consulting vascular surgeon did not qualify the patient for interventional treatment AT that time, but he recommended computed angio-tomography, but the patient did not rmake a follow-up visit.
What diagnosis should be made for the above patient?
Perform differential diagnosis
Are additional imaging tests necessary?
What should the invasive proceures strategy be?

**Case 16. ICAMB**

The patient was referred to the Vascular Surgery Outpatient Clinic by a family doctor because of a carotid stenosis accidentally detected in a Doppler ultrasound (RICA 80% stenosis, LICA 40%, LVA and RVA with normal flow). The plaques on both sides are described as mixed echogenicity, mainly echolucent with surface ulcers. The patient had a neurological episode three years ago (paresis of the right upper limb), was hospitalized in the neurology ward, but he does not have medical records from this event. Other comorbidities: hypertension, CABG. laryngeal cancer surgery with radiochemotherapy and permanent tracheostomy (10 years ago).

Make a diagnosis
Are additional tests needed?
Is surgical treatment necessary?
Suggest a type of surgery

**Case 17. BBAM**

An obese (weight 123 kg) 72 years old male, was referred to the Emergency Department (additional information on the referral card: loss of consciousness, abdominal pain). BP 80/40, HR 120 / min, lack of respiratory insufficiency. Contact with the patient was difficult. He was not aware of where he was, did not answer questions, did not comply with the instructions. The patient was pale. The ECG performed in the ambulance did not show any signs of myocardial ischaemia. From the family history: the patient was treated for hypertension and type 2 diabetes and he had abdominal pain radiating to the back for 3 days. The patient underestimated symptoms, because he had been suffering from low back pain of similar intensity for many years. On the day of the event, he suddenly fainted at the table while eating a meal. After a detailed examination of the patient, the emergency doctor found bruising of the perineum, groin and lower abdomen (bloody bruising). The family did not report that the patient had suffered any trauma in recent days.

What is the initial diagnosis?
Perform differential diagnosis
What additional tests are needed?
Suggest further treatment for this patient.

**Case 18. ICAMC**

A 68-year-old man, hospitalized in the neurology ward. Third day of hospitalization. Three days ago, the patient suddenly fainted, for more than an hour he had aphasia. He also felt numbness and weakness of the right hand. By the time he appeared in the ER, the aphasia disappeared, but the numbness and weakness of the left hand were still present. Physical examination in the ER: BP 80/40 on the left shoulder, BP 100/50 on the right shoulder; on the lower extremities pulses felt only in groins; on the upper limbs: no palpable pulse on the left radial artery, on the right radial artery weakly palpable. Co-morbidities include: hypothyroidism, COPD, coronary artery disease. Shortly after admission to the hospital All symptoms completely disappeared. Bilateral stenosis of the carotid arteries (LICA 70%, RICA 90%), right vertebral artery occlusion, partially retrograde flow in the left vertebral artery was found in the duplex doppler . There were no signs of bleeding or other significant pathologies in the CT scan of the head. The neurologist asked the vascular surgeon for a consultation.

What diagnosis should be made in this patient?
Perform differential diagnosis
What additional tests are needed?
Is surgical treatment recommended, if so, what type of the procedure and in what time interval?

**Case 19. KGWJA**

An 80-year-old woman brought by the emergency medical team to ER at 23:00 due to paresis of the upper left limb. Interview difficult. Aphasia. Two years ago, the patient suffered from an ischemic stroke in the left hemisphere. From today, she doesn't move his left hand. Associated diseases: HA, persistent atrial fibrillation, coronary artery disease (condition after NSTEMI 4 years ago) after hysterectomy with adnexectomy for about 10 years ago. Chronically accepts warfin - no INR control documentation.

Physical examination: Aphasia, RR 180/100, HR 80 / min, irregular heartbeat. Soft, painless belly. Pulse Lower right limb + + + - Lower left limb + + - - Upper right limb: pulse on the brachial artery, ulnar artery on the radial palpable. Upper left limb: pulse palpable in ulnar fossa slightly more tense than right, without pulse on radial artery. The left arm is slightly cooler than the right one. Muscle strength on this side is clearly lower.

What is the most likely diagnosis?

Differential diagnosis

Proposed imaging and laboratory tests

Treatment,

Prognosis

**Case 20. KNWJA**

A 65-year-old male reported to ER due to severe lower right limb pain for 24 hours. For 3 days he noticed the cooling of the right foot. Until now, he was in vascular surgery outpatient clinic because of intermittent claudication over a distance of 200 meters. Associated diseases: HA, coronary artery disease. In the physical examination RR 150/90 HR 100 / min, regular heart rate, soft, painless stomach. Pulse Lower right limb = lower left limb + - - - Right foot cold, blue, vascular play absent, active finger mobility absent, sensation absent. Left foot properly warmed vascular play 5 sec, active toe mobility and feeling preserved.

What is the most likely diagnosis?

Differential diagnosis

Proposed imaging and laboratory tests

Treatment – proposed procedure

Prognosis.

**Case 21. KNWJB**

Consultation in a cardiac surgery clinic. A 65-year-old patient after cardiac surgery with aortic counter pulsation from the left femoral artery. 2 hours after removal of the system, left foot cool. Another 2 hours later a consultation was reported. Intubated. Until now controlled in the vascular surgery outpatient clinic for intermittent claudication on a distance of 100 meters with left shin pain. In the physical examination RR 100/50 HR 80 / min. Pulse Lower right limb + - - - Lower right limb - - - - Left foot cold, blue, vascular game absent.

What is the most likely diagnosis?

Differential diagnosis

Proposed imaging and laboratory tests

Treatment - proposed treatment, procedure

Prognosis.

**Case 22. KGWJB**

Consultation in the Neurology Clinic. A 87-year-old patient in Stroke Center for right hemisphere stroke. No logical contact. Consultation request because of no palpable pulse on the left radial artery. In an interview (from medical records) NSTEMI 2 and 3 years ago. STEMI 5 months ago treated with coronary angioplasty with DES, HA, diverticular disease, post-hysterectomy with adnexectomy many years ago. In the physical examination RR 100/50 on Right upper limb on upper left limb 60/30 HR 50 / min. Soft, painless belly, pulse lower right limb = lower left limb + - - - upper right limb - pulse distally palpable. Upper left limb pulse not palpable from the brachial artery. Warming of both upper limbs is normal, symmetrical, vascular play is normal.

What is the most likely diagnosis?

Proposed imaging and laboratory tests

Differential diagnosis

Treatment

Prognosis.