VASCULAR DISORDERS

(CHAPTER 23)

QUESTION 1

Give some examples of peripheral vascular disease.

deep vein thrombosis – blood clotting within the peripheral veins

chronic venous insufficiency – failure of adequate blood return from the tissues

varicose veins – distended, worm-like veins in the legs due to valvular failure

QUESTION 2

What are two general conditions that affect the arteries?

atherosclerosis – formation of fatty plaques on the arterial wall, occluding blood flow

hypertension – remember that blood pressure is partially controlled by smooth muscle in the arterial wall, and chronically high BP can weaken this muscle!

QUESTION 3

What is the most common type of peripheral arterial disease (PAD?)

The most common type of peripheral arterial disease is **atherosclerosis**.

The **majority** of people 60 and older have at least **some degree** of atherosclerosis, although not all are necessarily symptomatic.

QUESTION 4

What are the three main consequences of atherosclerosis?

In general, the effect of atherosclerosis is **reduced perfusion** of tissues, particularly peripheral tissues.

This results in **poor oxygenation** and **poor nutrition** of the tissues, and poor perfusion of the kidneys can cause **acid-base imbalance**.

QUESTION 5

Rupture of which type of aneurysm has a high mortality rate?

The rupture of **any** aneurysm is potentially fatal, but **abdominal aortic aneurysms** (AAAs) have a particularly high mortality rate upon rupture due to the sheer amount of internal bleeding that can result.

Cerebral aneurysms are also particularly problematic due to the effects of **hemorrhagic stroke**; loss of perfusion of brain tissue can easily be fatal, not to mention increased ICP.

QUESTION 6

Why is arterial dissection considered an emergency?

Dissection, as mentioned in unit 12, is an emergent condition caused by the infiltration of blood **between the layers** of the arterial wall.

Aside from being extremely painful, the torn endothelium can **block blood flow** or cause enough turbulence to allow **intravascular clotting**.

Ultimately, there is a high risk of **ischemia**, resulting in **stroke**, **MI**, or **acute kidney injury (AKI.)**

QUESTION 7

Describe some of the tests and assessments that are useful in diagnosing PAD.

physical assessment – **diminished** (1+) peripheral pulses, **bruits**

treadmill test – exertion in a controlled environment to provoke **claudication**

creatinine and **BUN** – kidneys are very sensitive to O_2 availability; chronic arterial insufficiency may result in kidney failure

QUESTION 8

Describe some treatment options for PAD.

Management of **PAD** coincides with management of CAD, which we discussed in unit 12:

Lifestyle and **diet** changes: more exercise, less fats and cholesterol

Statin therapy to keep lipid levels in check

Surgical intervention: **angioplasty**, **stenting**, or **bypass**

QUESTION 9

Describe thoracic outlet syndrome. What are some possible treatments?

Thoracic outlet syndrome is a disorder affecting one or both **upper extremities**, caused by impingement of the nerves and blood vessels passing through the **thoracic outlet**.

Think of it as being similar to **carpal tunnel syndrome**, except that the impingement occurs in the **shoulder** rather than the wrist.

It can be considered a vascular disorder because the **subclavian artery** passes through the the thoracic outlet, and thus TOS can impede blood flow to the arm.

Symptoms vary depending on type, but usually include **pain** to part or all of the hand and arm, and can include **weakness**, **pallor**, and **atrophy**.

NSAIDs may help control inflammation thus reducing the severity of the impingement, and **physical therapy** can likewise be helpful.

If less drastic interventions are unsuccessful, **surgical decompression** may be indicated.

QUESTION 10

Why is Raynaud syndrome considered a type of PAD?

Raynaud syndrome is a rare **vasospastic** disorder in which spasm of the arterioles causes transient ischemia to the extremities, especially the **fingers**.

It triggered by exposure to **cold**, and most often onsets in **young women**.

Smoking is also a significant risk factor.

QUESTION 11

What problem is caused by chronic venous disease?

Chronic venous diseases result in impaired **return** of blood from the body to the heart, particularly from the **extremities**.

QUESTION 12

Give some examples of chronic venous diseases.

Chronic venous insufficiency can result in **pain** and **swelling** (edema) of the legs, as well as the formation of **varicose veins**.

Extreme cases of venous insufficiency can result in the formation of **venous ulcers** and increases the risk of **clotting** due to venous stasis.

QUESTION 13

What are some causes of chronic leg ulcers?

Increased venous blood pressure due to **chronic venous insufficiency** can result in damage to the skin, potentially progressing to an open wound.

As you've probably learned in assessment, venous stasis ulcers are typically **wide** and **shallow** with **irregular borders**.

Ulcers can also be caused by **ischemia** due to **peripheral arterial disease** and the resulting tissue necrosis.

In contrast, arterial ulcers are typically **deeper**, **round**, and have **well-defined** borders.

They also tend to occur most often in the **feet**, rather than the lower legs.

Neuropathy (as seen in diabetes mellitus) can also contribute to ulcer formation, although the process is somewhat different.

Chronically elevated blood sugar interferes with capillary perfusion, damaging the nerves and causing **decreased sensation**.

This, in turn, increases the likelihood of gradual or **unnoticed injuries**, which can become infected.

QUESTION 14

What is the cause of varicose veins?

Varicose veins form due to a combination of **valvular failure** and **increased venous BP** causing damage to the vessel walls.

Over time, gravity causes the leg veins to become **distended**, as the incompetent valves are no longer preventing the back-flow of blood.

QUESTION 15

Describe the risks caused by deep vein thrombosis (DVT.) How is it treated?

Deep vein thrombosis or DVT occurs when a **clot** forms **within the lumen** of a vein, typically in the leg and often precipitated by **venous stasis**.

The classic presentation is **inflammation** and **edema** of the affected extremity. Diagnosis is achieved through **ultrasound**.

The major risk of DVT is that the clot may **dislodge** and become a **thromboemolism**.

Upon returning to the right side of the heart, it may be ejected into the **lungs** and become a **pulmonary embolism**.

QUESTION 16

How are the walls of blood vessels affected by chronic hypertension?

The walls of arteries **thicken** and become **less compliant** in order to resist the increased intraluminal pressure.

This **decreases** the arteries' ability to dilate and constrict, and **increases** the risk of developing atherosclerosis.

QUESTION 17

Contrast essential (primary) hypertension with secondary hypertension.

Essential or primary hypertension is the most common type, and is a **multifactorial** disorder involving both **genetic** and **environmental** factors.

Remember how "essential" or "primary" is defined: a disease process that exists **on its own** without any underlying, causative condition.

In contrast, **secondary** hypertension **does** involve an underlying condition.

This underlying condition is commonly related to **kidney disease**, which interferes with the body's normal homeostasis of blood pressure.

It can also be caused by **coarctation** (partial narrowing) of the aorta, which causes the heart to pump harder to overcome the added resistance.

QUESTION 18

List some long-term consequences of hypertension.

Chronically high BP results in **increased workload** of the **heart**, and can progress to **heart failure**.

Thickening and scarring of the arterial walls promotes **plaque formation** and **clotting**, increasing risk of **stroke** and **MI**.

Kidney damage due to excessive BP can result in **chronic kidney disease**.

QUESTION 19

What is a hypertensive crisis?

A **hypertensive crisis** is a medical emergency defined as having BP in excess of **180/120**.

Symptoms include **headache**, **confusion**, **blurred vision**, **chest pain**, and **anxiety**.

Treatment is typically achieved with **IV anti-hypertensives** such as **hydralazine** due to their fast action over PO formulations.

QUESTION 20

List some drugs that are used in the treatment of hypertension.

You probably know this from pharmacology already, but just to recap:

Beta-blockers: metopro**lol**, propano**lol**, etc.

ACE inhibitors: lisino**pril**, benaze**pril**, etc.

ARBs: lo**sartan**, val**sartan**, etc.

CCBs: amlo**dipine**, nife**dipine**, diltiazem, etc.