Vasculitis

- Inflammation of the walls of vessels
- It is encountered in diverse clinical settings
- C/F:
    - Constitutional signs and symptoms
        - fever,
        - myalgias,
        - arthralgias,
        - malaise
    - local manifestations of downstream tissue ischemia
- **Systemic necrotizing vasculitides**: aorta and mediumsized vessels
- **Small vessel vasculitis**: arterioles, venules, and capillaries
- **Overlap syndromes**: Can fit any single entity
- mechanisms of vasculitis
    - direct invasion of vascular walls by infectious pathogens
    - immune-mediated mechanisms
    - Physical and chemical injury, such as irradiation, mechanical trauma, and toxins

Pathogenesis of Noninfectious Vasculitis

(1) immune complex deposition,

(2) antineutrophil cytoplasmic antibodies

(3) anti-endothelial cell antibodies

immune complex deposition

- DNA-anti-DNA complexes **in SLE**
- Hypersensitivity to drugs**:** penicillin and streptokinase
    - leukocytoclastic vasculitis
    - polyarteritis nodosa
    - Wegener granulomatosis
    - Churg-Strauss syndrome
- viral infections: HBsAg-anti-HbsAg in hepatitis-induced vasculitis

Antineutrophil Cytoplasmic Antibodies

- c-ANCA
    - Against proteinase-3 (PR3)
    - Wegener granulomatosis
- p-ANCA
    - Against MPO
    - Microscopic polyangiitis and Churg-Strauss syndrome

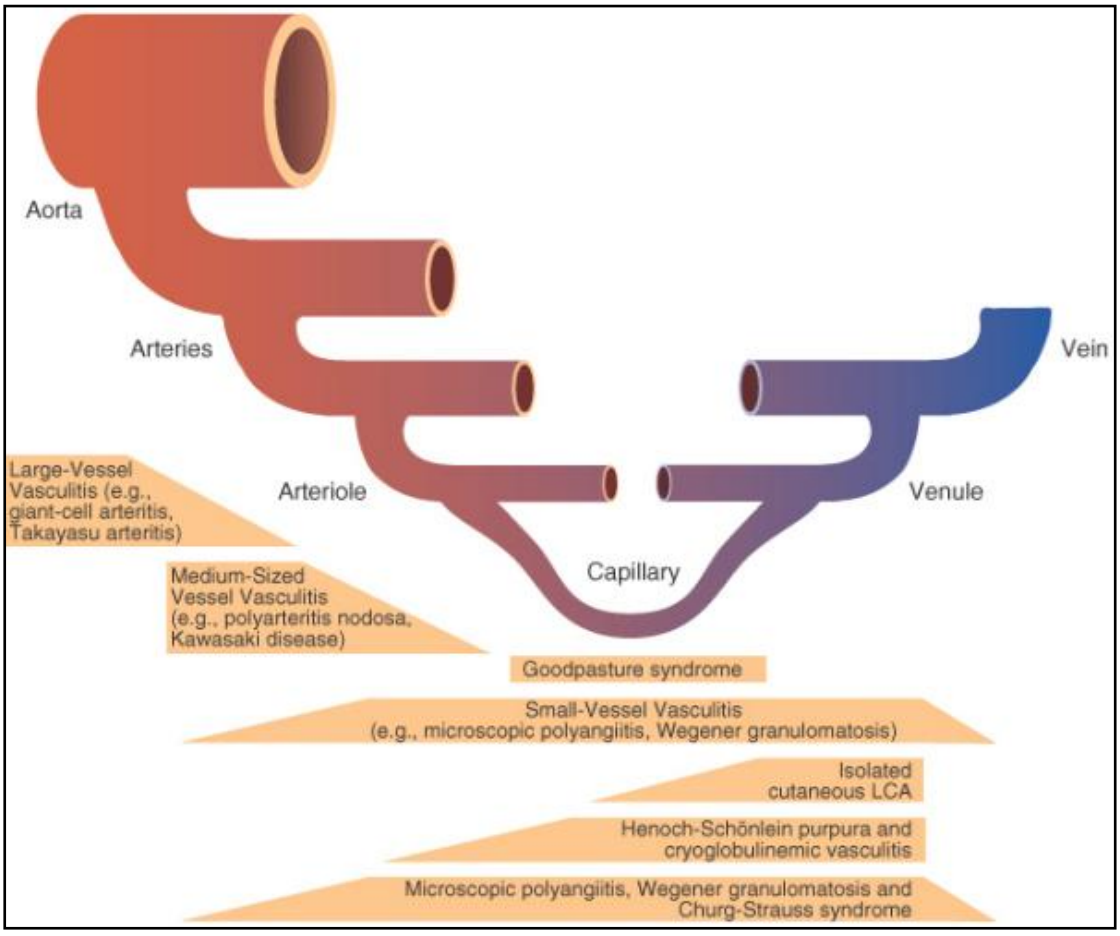
Anti-endothelial cell antibodies

- SLE
- Kawasaki disease

Classification

on the basis of

- the size of blood vessel
- anatomic site
- histologic characteristics of the lesion
- clinical manifestations



GIANT CELL (TEMPORAL) ARTERITIS

Clinical Features

Rare before age 50.

Symptoms are

Constitutional: fever, fatigue, weight loss—

Localizing: facial pain or headache, often most intense along the course of the superficial temporal artery, which may be painful to palpation.

Visual loss may follow ophthalmic artery involvement.

adequate biopsy requires at least a 2- to 3-cm length of artery (segmental nature of disease)

Pathology

Inflammation of arteries of large to small size

It affects principally the arteries in the head—especially the temporal arteries—but also the vertebral and ophthalmic arteries and the aorta, where it may cause thoracic aortic aneurysm.

Inflammation that involves the inner half of the media is either:

- Granulomatous
- Mixed acute and chronic

TAKAYASU ARTERITIS

Pathology

granulomatous vasculitis of medium and larger arteries followed by fibrous thickening and obliteration of origin of branches (intimal thickening)

it mainly affects aorta and its branches causing ocular abnormalities and week pulses in the upper limbs

Histologically, the changes range from an adventitial mononuclear infiltrate with perivascular cuffing of the vasa vasorum to intense mononuclear inflammation in the media

With granuloma

Thus, distinctions among active giant cell lesions of the aorta are based largely on the age of the patient, and most giant cell lesions of the aorta in young patients are designated Takayasu arteritis

Clinical features

Females

Younger than 40

Pathogenesis: unknown

POLYARTERITIS NODOSA

Clinical features

Usually young adults

There course is characterized by remission and relapses

The most common manifestations are malaise, fever of unknown cause, and weight loss

hypertension, usually developing rapidly;

abdominal pain and melena (bloody stool)

diffuse muscular aches and pains

peripheral neuritis, which is predominantly motor.

Renal arterial involvement is often prominent and is a major cause of death.

There is no glomerulonephritis.

About 30% of patients with PAN have hepatitis B antigen in their serum.

Pathology

small or medium-sized muscular arteries (but not arterioles, capillaries, or venules),

typically involving renal and visceral vessels but sparing the pulmonary circulation.

Clinical manifestations result from ischemia and infarction of affected tissues and organs.

Most frequently kidneys, heart, liver, and gastrointestinal tract

segmental transmural necrotizing inflammation of **arteries of medium to small size**

predilection for branching points and bifurcations

aneurysmal dilation or localized rupture may results from segmental vessel wall weakness

histologic picture

- acute phase: **transmural mixed inflammation of the arterial wall** accompanied by **fibrinoid necrosis**
- **later: fibrous thickening of the vessel wall**
- **Particularly characteristic of PAN is that all stages of activity may coexist in different vessels or even within the same vessel**

KAWASAKI DISEASE (MUCOCUTANEOUS LYMPH NODE SYNDROME)

often involves the coronary arteries, usually in young children and infants (80% of cases are <4 years old)

It is associated with the *mucocutaneous lymph node syndrome*

Approximately 20% of patients develop cardiovascular sequelae

Acute fatalities occur in approximately 1% of patients

The vasculitis is PAN-like, with necrosis and pronounced inflammation affecting the entire thickness of the vessel wall, but fibrinoid necrosis is usually less prominent

MICROSCOPIC POLYANGIITIS (MICROSCOPIC POLYARTERITIS, HYPERSENSITIVITY, OR LEUKOCYTOCLASTIC VASCULITIS)

The major clinical features are hemoptysis, arthralgia, abdominal pain, hematuria, proteinuria, hemorrhage, and muscle pain or weakness

It typically presents as "palpable purpura" involving the skin

necrotizing vasculitis generally affects arterioles, capillaries, and venules

necrotizing glomerulonephritis (90% of patients) and pulmonary capillaritis involvement are particularly common

In 70% of patients, p-ANCAs are present.

The lesions of microscopic polyangiitis are often histologically similar to those of PAN

Granulomatous inflammation is absent

Immunoglobulins and complement components are often present in the vascular lesions of the skin, especially if these are examined within 24 hours of development, but in general, there is a paucity of immunoglobulin demonstrable by immunofluorescence microscopy ("pauci-immune injury").

In some lesions the change (most commonly found in postcapillary venules) is limited to infiltration with neutrophils, which become fragmented as they follow the vessel wall (leukocytoclasia).

It is called hypersensitivity angitis because of identification of certain offending agents: drugs (e.g., penicillin), microorganisms (e.g., streptococci), heterologous proteins, and tumor antigens.

Disseminated vascular lesions of hypersensitivity angiitis may also appear in Henoch-Schönlein purpura, essential mixed cryoglobulinemia, vasculitis associated with some of the connective tissue disorders, and vasculitis associated with malignancy.

Allergic granulomatosis and angiitis (Churg-Strauss syndrome)

A systemic vasculitis that is characterized by necrotizing vasculitis accompanied by granulomas with **eosinophilic** necrosis.

p-ANCAs in 50%.

A strong association with allergic rhinitis, bronchial asthma, and eosinophilia.

WEGENER GRANULOMATOSIS

(1) *acute necrotizing granulomas* of the respiratory tract

(2) *necrotizing or granulomatous vasculitis* affecting small to medium-sized vessels (e.g., capillaries, venules, arterioles, and arteries), most prominent in the lungs and upper airways

(3) renal disease in the form of *focal necrotizing, often crescentic, glomerulitis*.

More common in males

Mean age of 40 years

Typical clinical features include

- persistent pneumonitis with bilateral nodular and cavitary infiltrates (95%),
- chronic sinusitis (90%),
- mucosal ulcerations of the nasopharynx (75%),
- Renal disease (80%).

c-ANCAs are present in the serum in up to 95%

THROMBOANGIITIS OBLITERANS (BUERGER DISEASE)

is characterized by segmental, thrombosing, acute and chronic inflammation of medium-sized and small arteries, principally the tibial and radial arteries and sometimes secondarily extending to veins and nerves of the extremities

Young heavy smoker male

Pathology

- **sharply segmental acute and chronic vasculitis of medium-sized and small arteries**, mostly of the upper and lower extremities
- **Luminal thrombosis**
- **Granuloma formation**
- **Involvement of nearby veins and nerves**

VASCULITIS ASSOCIATED WITH OTHER DISORDERS

Homework???