Chapter 37
Polyarteritis Nodosa

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Definition

Polyarteritis nodosa (PAN) is necrotizing inflammation of medium-sized or small arteries without glomerulonephritis or vasculitis in arterioles, capillaries, or venules. This inflammation commonly leads to vessel wall weakening with formation of microaneurysms, stenosis, endothelial dysfunction, and/or thrombotic formation [1].

PAN may present as a systemic disease or may involve a single organ.

PAN may affect any organ except lungs. Skin lesions are present in about 50 % of patients. Livedo reticularis, bullous or vesicular eruptions, infarctions, ulcerations, tender erythematous nodules (subcutaneous), and ischemic changes of the distal digits or a combination may occur. Peripheral nerve (e.g., mononeuritis multiplex), articular (large joints preferentially), renal, hepatic, cerebral, gastrointestinal, and testicular involvements are frequent. Visceral involvement may be present at disease onset [2, 3].

Cases of polyarteritis nodosa limited to skin (cutaneous PAN), gall bladder, pancreas, female and male genital tracts, calf muscles, kidneys, and gastrointestinal tract have also been reported.

Cutaneous PAN causes transmural inflammation of small- and medium-sized arteries of the dermis and subcutaneous tissue, leading to fibrinoid necrosis and formation of cutaneous nodules (4–15 mm) along superficial arteries. Larger inflammatory plaques may be seen. When the plaques heal, they leave patches of postinflammatory pigmentation. Infarcts in the skin present as purple or black patches or blood-filled blisters [1] (Figs. 37.1 and 37.2).

There is no known etiology for PAN, although numerous infectious agents (e.g., hepatitis B and C, cytomegalovirus, parvovirus) have been implicated in the

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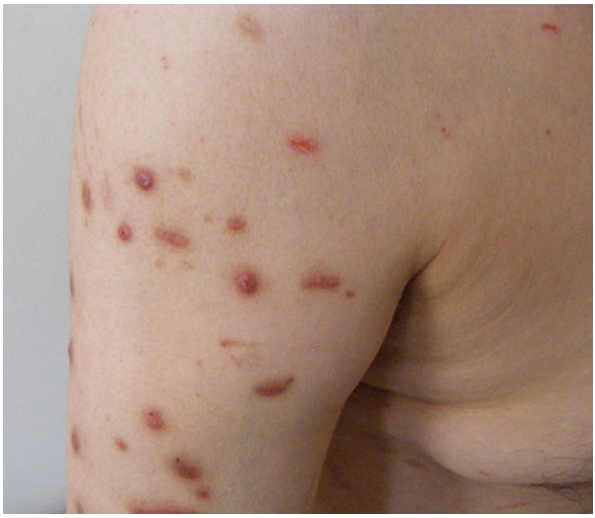


Fig. 37.1 Vesicular eruptions of patient with PAN. The eruptions are more frequent in upper and lower extremities than trunk

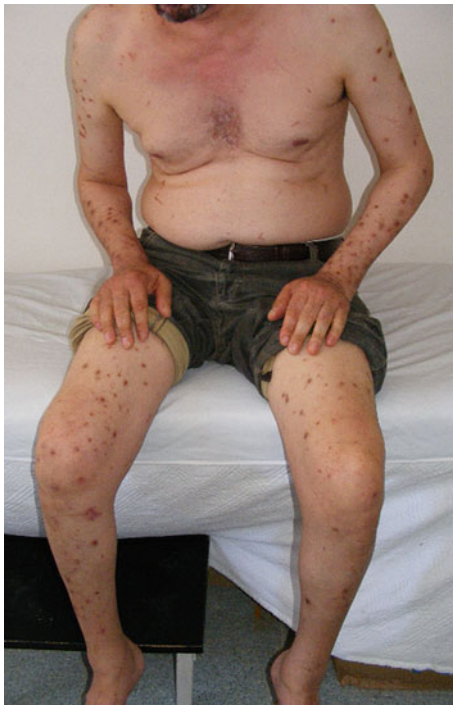


Fig. 37.2 Vesicular eruptions of patient with PAN. The eruptions are more frequent in upper and lower extremities than trunk

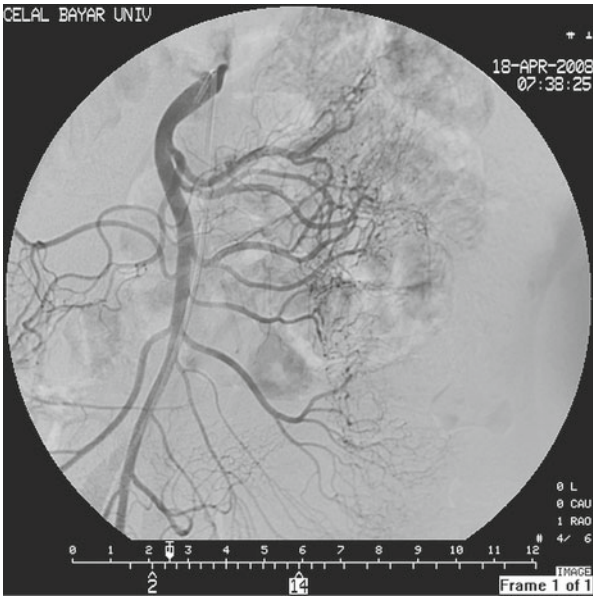


Fig. 37.3 The superior mesenteric artery angiography of the same patient shows the millimetric aneurysms

pathogenesis. The association of PAN with HBV is particularly strong. PAN may develop within the first 6 months of an HBV infection as a result of immune-complex formation [4].

Diagnosis of PAN requires the integration of clinical, angiography, and biopsy findings. The ACR classification criteria of PAN are commonly used with 82.2 % of sensitivity and 86.6 % of specificity. Antineutrophil cytoplasmic antibodies (ANCA) are negative in PAN. The renal, hepatic, and mesenteric vessels are the most frequently involved vessels in PAN. The typical angiographic appearance includes segments of arterial stenosis alternating with normal or dilated artery areas, smooth tapered occlusions, and thrombosis. The dilated segments have saccular and fusiform aneurysms [5, 6] (Figs. 37.3 and 37.4).

Differential Diagnosis

A cutaneous form of polyarteritis, affecting predominantly the lower extremities, is distinguished from systemic PAN by its restriction to the skin and to the neurological and osteo-muscular systems and lack of visceral involvement and benign course. Skin biopsy of a typical lesion is usually performed to make an accurate diagnosis of cutaneous PAN.

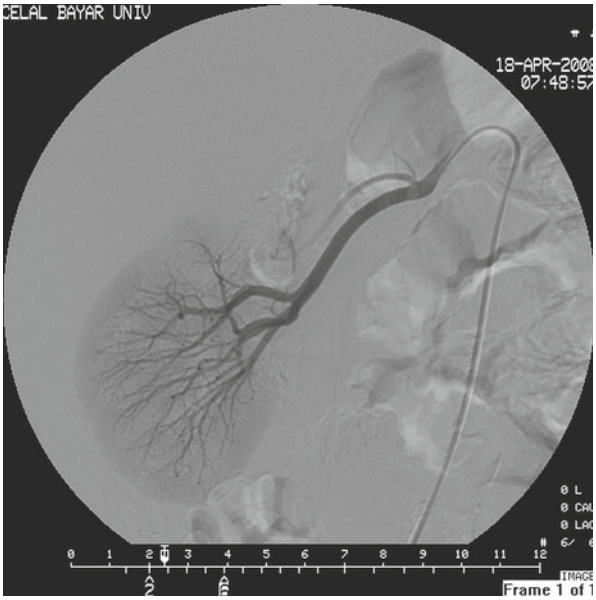


Fig. 37.4 The renal artery angiography of the same patient shows the millimetric aneurysms

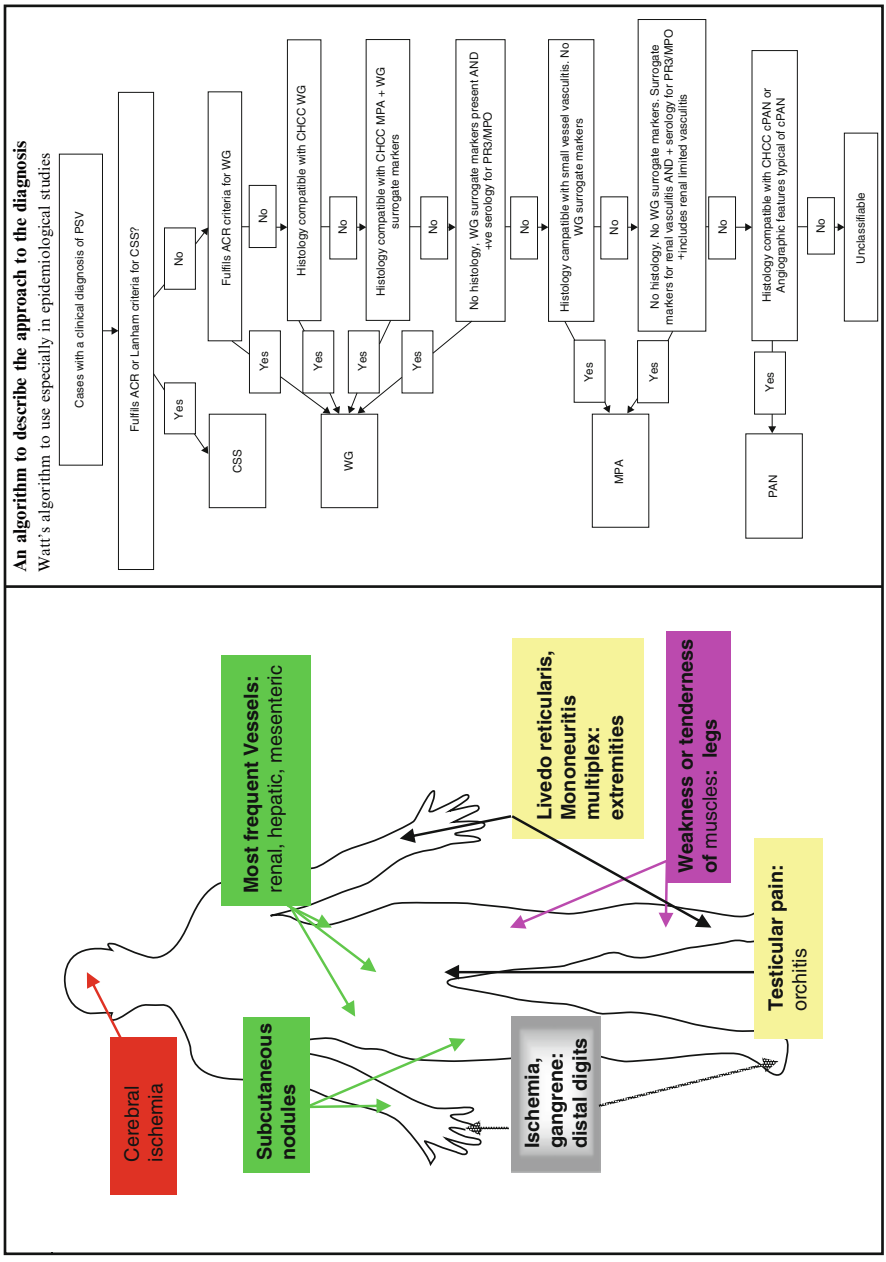
The skin involvement in microscopic polyangiitis (MPA) is frequent, typically a purpuric rash, nail bed infarcts, splinter hemorrhages, livedo reticularis, skin infarction, or ulceration may mimic PAN. The frequency of skin lesions in PAN and in MPA is roughly similar. MPA is distinguished by small-vessel vasculitis in the pulmonary and renal vasculature, glomerulonephritis, normal angiography, and the tendency to relapse [2].

Medium-sized vessel vasculitis mimicking PAN may be a manifestation or complication of secondary vasculitis such as systemic lupus erythematosis, rheumatoid arthritis, Sjögren syndrome, hairy cell leukemia, and myelodysplastic syndrome. The visceral angiographic appearance of vasculitis, including bacterial endocarditis, left atrial myxoma, drug abuse, pancreatitis, and abdominal malignancy, can mimic PAN [2, 5].

Biopsy Histopathology

Biopsy of an affected artery can confirm the diagnosis. The demonstration of focal, segmental, panmural, necrotizing inflammation of medium-sized arteries with a predilection for bifurcations is the gold standard for the diagnosis of PAN. Different stages of the inflammatory process may be present simultaneously. PMNs and occasionally eosinophils exist in early lesions; later lesions contain lymphocytes and plasma cells exist in later lesions. Granulomatous inflammation does not exist.

The specimen for biopsy may include the skin, skeletal muscle, sural nerve, liver, and kidney, depending on the clinical features. Muscle biopsy is positive in around 50 % of patients with PAN who have muscle pain or claudication. The sub-dermis should be included into the skin specimen to detect medium-sized vessel involvement [2, 6].


An algorithm to describe the approach to the diagnosis
Watt's algorithm to use especially in epidemiological studies
Cases with a clinical diagnosis of PSV
Fulfils ACR or Lanham criteria for CSS?
Yes
No
CSS
Fulfils ACR criteria for WG
Yes
No
WG
Histology compatible with CHCC WG
Yes
No
Histology compatible with CHCC MPA + WG surrogate markers
Yes
No
No histology, WG surrogate markers present AND +ve serology for PR3/MPO
Yes
No
MPA
Histology campatible with small vessel vasculitis. No WG surrogate markers
Yes
No
No histology. No WG surrogate markers. Surrogate markers for renal vasculitis AND + serology for PR3/MPO +includes renal limited vasculitis
Yes
No
PAN
Histology compatible with CHCC cPAN or Angiographic features typical of cPAN
Yes
No
Unclassifiable
Cerebral ischemia
Subcutaneous nodules
Most frequent Vessels: renal, hepatic, mesenteric
Ischemia, gangrene: distal digits
Livedo reticularis, Mononeuritis multiplex: extremities
Weakness or tenderness of muscles: legs
Testicular pain: orchitis

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