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CASE REPORT

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Pseudovasculitis and corticosteroid therapy

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Abstract Pseudovasculitis, vasculitis-like syndromes, vasculitis look-alikes, or mimics of vasculitis represent a heterogeneous collection of disorders that are capable of simulating vasculitis. Inappropriate diagnosis leads to delay or absence of proper management and exposure to potentially deleterious treatment modalities such as corticosteroids and cytotoxic agents. We report the case of fibromuscular dysplasia suspected to be a polyarteritis nodosa. The progression of the lesions visualized by the ultrasonographic study and computed tomography (CT) scan after 10 days of treatment led to an emergency laparotomy. The possible deleterious role of steroids given to treat the suspected vasculitis is discussed.

Keywords Corticosteroids · Pseudo-polyarteritis nodosa (PAN) · Vasculitis

Introduction

The diagnosis of vasculitis is usually based on pattern recognition of the presenting clinical features, laboratory tests for some of them such as antineutrophil cytoplasmic autoantibody (ANCA) determination, angiographic imaging for medium and large artery vasculitis, and whenever possible biopsy proof [1]. Classification criteria were established in the 1990s; however, when applied in the clinical setting, many initial clinical presentations remain difficult to classify. In these situations, the differential diagnosis should always include pseudovasculitis.

Pseudovasculitis, vasculitis-like syndrome, or mimics of vasculitis represent a heterogeneous collection of disorders that are capable of simulating vasculitis. Some conditions such as cardiac myxomas, cholesterol embolization, subacute endocarditis, and fibromuscular dysplasia are more apt to cause confusion, but numerous conditions can also be misleading. The diagnosis of pseudovasculitis requires a high index of suspicion. However, inappropriate diagnosis leads to delay or absence of proper management and exposure to potentially deleterious treatment modalities such as corticosteroids and cytotoxic agents [2, 3].

We report the case of a patient with fibromuscular dysplasia, suspected to be polyarteritis nodosa (PAN), whose abdominal vascular imaging evolution after 10 days of steroids led to an emergency laparotomy.

Case report

A 35-year-old woman was admitted to the hospital because of diffuse abdominal pain of 6 days duration without diarrhea and vomiting. She had no remarkable past medical history except a history of allergy to antispasmolytic drugs. She had felt increasingly tired for several months, but she had not lost weight or complained of headaches. On physical examination, the patient's pulse rate was 90 bpm, blood pressure was 160/100 mmHg, and her temperature was 37°C. Neither anemia nor jaundice was observed. The abdomen was soft, but tender to palpation. Signs of peritoneal irritation were absent. No abnormal cardiopulmonary findings were appreciated. No abnormal neurological sign was present. Laboratory work-up revealed mild

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leukocytosis without anemia. The erythrocyte sedimentation rate (ESR) was 16 mm/h, the C-reactive protein (CRP) level 23 mg/l, serum alanine aminotransferase 18 U/l, serum aspartate aminotransferase 13 U/l, blood urea nitrogen 2.5 mmol/l, and serum creatinine 66 μmol/l. Amylase and lipase were in the normal range. The coagulation tests including antiphospholipid antibodies were in the normal range. Immunology tests for rheumatoid factor, antinuclear antibodies, anti-double-stranded DNA antibodies, antinucleoprotein antibodies, cryoprecipitate, hepatitis C virus antibodies, and hepatitis B virus surface antigen were negative. The urine was negative for protein; the sediment contained 0–2 red cells, 10–20 white cells, and 0–2 hyaline, granular and white cell casts per low power field. An electrocardiogram was normal, and the radiograph of the chest showed no abnormalities.

An ultrasonographic study of the abdomen revealed an ''inflammatory'' mantle of the splenic artery and the suspicion of dilatation of the celiac axis. A computed tomography (CT) scan with contrast of the abdomen and pelvis confirmed the inflammatory mantle of the splenic artery and one aneurysm of the celiac axis (Fig. 1). In addition, the CT scan showed multiple stenosis of the hepatic artery. Angio-MRI (magnetic resonance imaging) and angiograms of the abdominal axis confirmed the CT scan findings. The thoracic and abdominal aorta and the carotid axis were normal. The differential diagnosis included vasculitis and other more uncommon entities. Essentially based on the radiology imaging, the diagnosis of PAN was suspected. The patient received 80 mg of prednisone. The abdominal symptoms disappeared rapidly, and the patient was discharged a few days later under close surveillance. Ten days later she felt well. A new ultrasonographic study of the abdomen planned to monitor the evolution of the visceral arterial lesions revealed a significant progression of the celiac aneurysm and a new splenic arterial aneurysm (Fig. 1). She was referred to the surgeon for a laparotomy. The celiac aneurysm and the splenic artery were resected and a splenectomy was performed. The histological analysis showed architectural anomalies of the wall arteries mainly located in the media. The medial arterial wall contained excessive numbers of irregularly

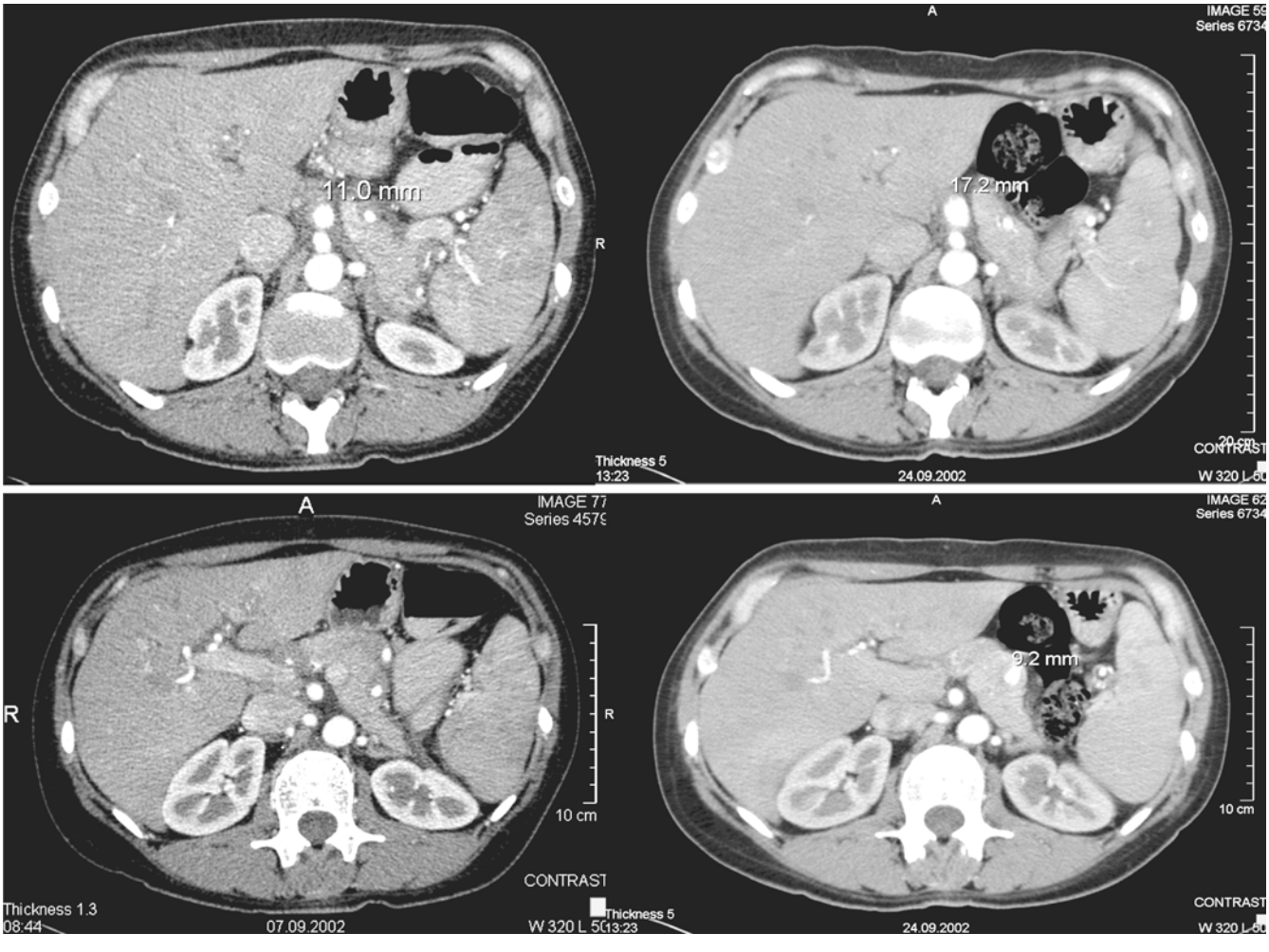

Fig. 1 Computed tomography scan with contrast of the patient's abdomen. *Top left*: aneurysm of the celiac axis (Ø11.0 mm). *Top right*: significant progression of the aneurysms of the celiac axis after 10 days of steroids (Ø17.2 mm). *Bottom*: new aneurysm of the splenic artery before (*left*) and after 2 weeks of steroids (*right*) (Ø9.2 mm)

oriented smooth muscle cells, which led to broadening of the wall. Other parts of the wall were very thin leading to aneurysms. No inflammatory elements suggesting a vasculitis were observed. The histological findings were compatible with a fibromuscular dysplasia (diffuse medial fibrodysplasia) (Fig. 2). The postoperative course was uneventful and she was discharged 1 week later. CT scan with contrast and an angio-MRI were performed 9 months later and revealed no significant lesions in other visceral arteries.

Discussion

The localization and the aspect of celiac, hepatic, and splenic artery lesions visualized with the CT scan and angiographies were compatible with the diagnosis of vasculitis of medium or large arteries. Medium-sized vessel vasculitides include PAN and Churg–Strauss vasculitis; large vessel vasculitides include Takayasu's disease and gigantocellular arteritis. PAN was considered to be the most likely. The differential diagnoses include pseudovasculitis syndromes such as fibromuscular dysplasia or less probably Ehlers–Danlos syndrome type IV, cholesterol embolization, or thromboangiitis obliterans.

The diagnosis of PAN is based on clinical, laboratory, imaging, and histological findings. PAN is a necrotizing angiitis involving medium-sized arteries that is characterized by predominant typical features including skin lesions (palpable purpura, livedo reticularis, necrotic lesions, and infarcts of the fingertips),

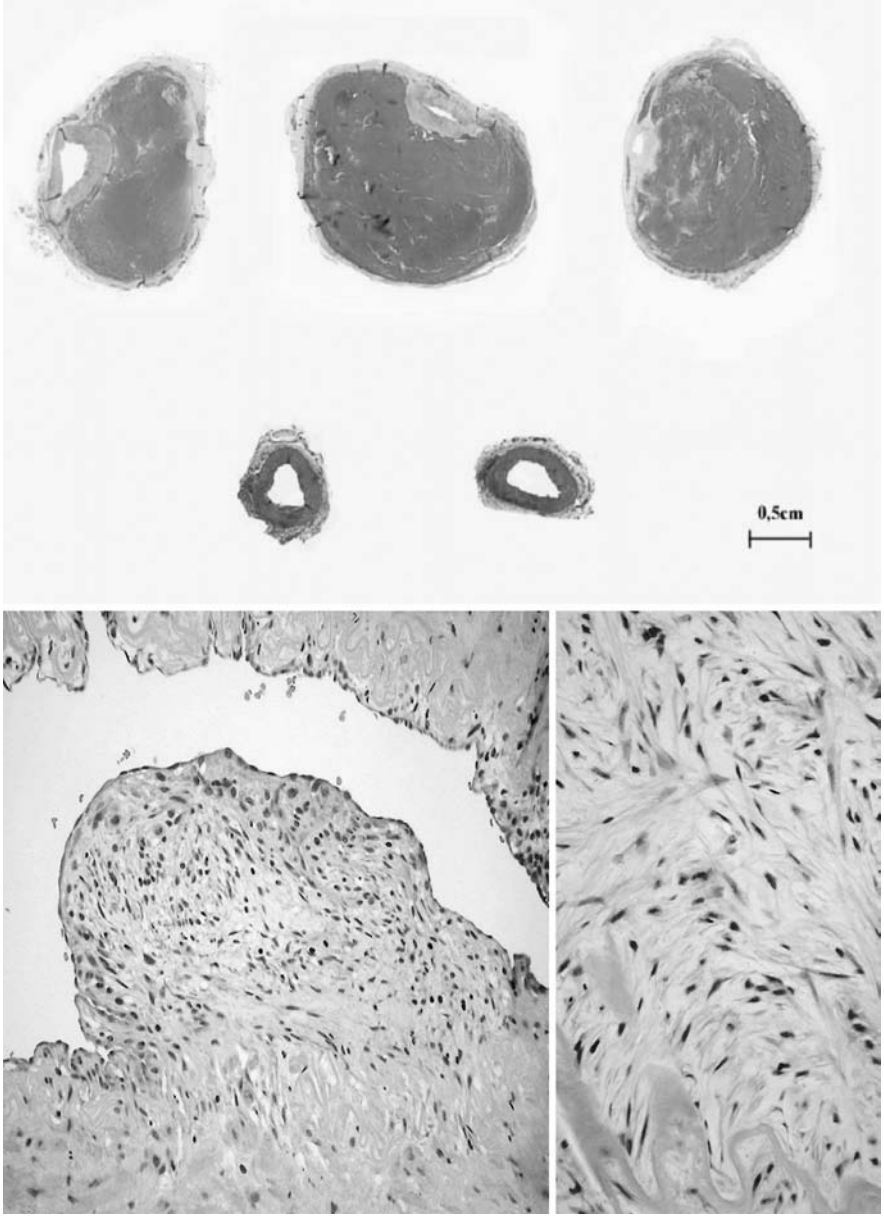

Fig. 2 Histological characteristics. *Top*: sequential cross sections of the splenic artery obtained at different levels. Sections in the lower row are from areas of normal diameter; in contrast, the three sections in the upper row show a large aneurysmal dilatation caused by perimedial dissection. H&E, ×1. *Bottom*: cross section from the splenic artery showing focal thickening alternating with areas in which the media is unusually thin. H&E, ×100. The photomicrograph on the right shows a detail of the media with disorganized smooth muscle cells dispersed within loose connective tissue. H&E, ×200

mononeuritis multiplex, and distinctive abnormalities of renal sediment. Laboratory tests including antinuclear antibodies, rheumatoid factor, ANCA, etc. are usually negative. ESR and CRP are useful in longitudinal evaluation of disease activity but are nonspecific and do not correlate well with the presence or absence of active disease in all patients [4, 5]. The gold standard for the diagnosis of vasculitis is biopsy of the involved site. If such a site is unavailable, angiography can be performed. The classic clinical features were absent in our young patient; however, gastrointestinal involvement is not so uncommon and retrieved in more than half of the patients with PAN [6]. Gastrointestinal symptoms such as initial and exclusive features have been described in PAN and they are challenging because of their nonspecific nature and the requirement for mesenteric angiography or surgical exploration [7]. The consequence of mesenteric artery involvement can be disastrous with infarction or aneurysmal rupture [6, 8–11]. Confirmation of the diagnosis requires invasive procedures, such as angiography or even exploratory laparotomy, which are not without risks in inflammatory tissue. High doses of corticosteroids should be rapidly initiated.

In our patient, the laparotomy performed 10 days later finally led to the diagnosis. The histology was typical for a medial fibromuscular dysplasia. Medial fibromuscular dysplasia occurs primarily in the distal two-thirds of the renal artery but also throughout the cervicocranial arterial system. Fibromuscular dysplasia is detected less commonly in other visceral arteries including the celiac, superior and inferior mesenteric, hepatic, and splenic arteries like in our patient.

The management decisions are not always easy and depend on the expertise available at the institution, the presence or absence of symptoms, and the numbers and size of aneurysms. Surgical intervention, aneurysm embolization, or conservative management are the three alternative therapeutic options, but prospective studies are lacking to determine the optimal management [12–14].

In this case, the role of 10 days of corticoids in the rapid and deleterious evolution of the lesions remains an open question. Corticosteroids have the potential to alter both circulating volume and vascular resistance leading to increased blood pressure. In addition, corticoids can directly modify the vessel wall by inhibiting the smooth muscle cell chemotaxis and proliferation. In our case, both mechanisms could have contributed to weakening the abnormal wall arteries due to the fibromuscular dysplasia lesions [15, 16].

Few case reports of visceral fibromuscular dysplasia have been described with an acute abdomen due to aneurysmal rupture in patients with radiological and laboratory features suggesting a vasculitic process. Most of them have been described with the histological diagnosis of segmental mediolytic arteriopathy, a variant form of fibromuscular dysplasia [17–21].

In conclusion, clinicians and radiologists must be circumspect in making the diagnosis of vasculitis by relying solely or too heavily on radiographic imaging. If immunosuppressive drug therapy is initiated, close follow-up is recommended. In fibromuscular dysplasia, corticosteroid therapy can be directly and rapidly deleterious for the vascular wall, leading, as we speculate in our case, to worsening of the lesions.

Take home message

Clinicians and radiologists must be circumspect in making the diagnosis of vasculitis by relying solely or too heavily on radiographic imaging.

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