Eosinophilic Granulomatosis with Polyangiitis (Churg-Strauss Syndrome) Presenting with Abdominal Vasculitis and Mononeuritis Multiplex Diagnosed Using Computed Tomography and Laparoscopy: a case report

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ABSTRACT

Eosinophilic granulomatosis with polyangiitis (EGPA or Churg-Strauss syndrome) is a rare type of necrotizing vasculitis affecting small- to medium-sized vessels and typically characterized by asthma, lung infiltrates, necrotizing granulomas, and hypereosinophilia. It is a potentially fatal disease that must be diagnosed promptly. Herein, we report a case of EGPA presenting with severe gastrointestinal eosinophilic vasculitis, renal infarct, splenic infarct, and mononeuritis multiplex. A 30-year-old female patient with asthma, paresthesia, and abdominal pain was admitted. An emergent abdominal computerized tomography (CT) was suggestive of swollen small bowel and multiple small infarcts in the spleen and right kidney. The laboratory analysis indicated remarkable eosinophilia, microscopic hematuria, elevated levels of serum total IgE, and negative antineutrophil cytoplasmic antibodies. Small intestine biopsy revealed vasculitis of a medium-sized artery with infiltration of eosinophils. An electromyography and nerve conduction study detected mononeuritis multiplex. High-dose methylprednisolone was immediately started. Abdominal pain, microscopic hematuria, and eosinophilia improved gradually. The findings of abdominal CT scan in this patient were greatly helpful in the early diagnosis and treatment. To our knowledge, few reports about the abdominal CT findings in patients with EGPA were published.
CASE PRESENTATION

A 30-year-old female patient presented to the hospital with paresthesia of the right hand and both lower legs that had lasted for 1 month and accompanied with increasing periumbilical abdominal pain and cold sweat for 5 days. The past medical history included asthma in the recent year. She smoked tobacco for 5 years. The asthma had been treated successfully with an inhaled bronchodilator and oral corticosteroid. She received no leukotriene receptor antagonists such as montelukast.

Physical examination revealed clear breathing sounds. There was rebound tenderness over the periumbilical abdomen. No mass was palpable on the abdomen. Neurological examination revealed atrophy of the intrinsic muscle on the dorsum of the right hand in combination with sensory loss and paresthesia on touch in the right hand, both feet, and lower legs. Neither purpura nor ecchymosis was found on the skin.

Laboratory data showed the followings: white blood cell count: 34.3 x 10^9/l; hemoglobin: 11.5 g/dl; platelets: 490 x 10^9/l; neutrophils: 39.0%; eosinophils: 51.5%; immunoglobulin E: 4447 IU/ml (normal range: 1.31–165.3); rheumatoid factor: 671 IU/ml, (normal range: 0–120); anti-cyclic citrullinated peptide antibodies: 1.3 U/ml (normal range: 1–10); antinuclear antibody: negative; anti-DNA antibody: negative; anti-cardiolipin IgG: 2.3 GPL (normal range: 0–10); erythrocyte sedimentation rate: 45 mm/h; C-reactive protein: 54 mg/l (normal level: <5); cryoglobulin screen: negative; antineutrophil cytoplasmic antibodies (ANCA): negative; anti-myeloperoxidase (MPO): 0.0 IU/ml (normal range: 0–10); peripheral blood filariasis: not found; stool ova: not found; red blood cells in urine: 50–100/HPF.

Chest radiograph showed a normal heart size and clear lung field. An abdominal sonogram revealed normal liver parenchyma, thickened gall bladder wall with sludge, and dilated bowel loops. Abdominal CT scan detected a segment of dilated and swollen small bowel (Fig. 1), multiple hypo-attenuated foci in the spleen (Fig. 2), and a small wedge-shaped perfusion defect at the anterior aspect of the right kidney (Fig. 3). Gastrointestinal panendoscopy showed reflux esophagitis, esophageal ulcer, and antral...
ulcers. Mild to moderate mitral regurgitation and mild tricuspid regurgitation were evident on the echocardiogram. An electromyography and nerve conduction study showed axonopathy of the right median, right sural, bilateral peroneal, and right tibial nerves compatible with mononeuritis multiplex. Laparoscopy revealed a segment of reddish and swollen small bowel (Fig. 4). Biopsy from the small intestine showed vasculitis of a medium-sized artery with partial fibrinoid necrosis of the vascular wall (Fig. 5). Focal aggregation and perivascular infiltration of eosinophils were detected in the submucosa.

**Figure 4.** Laparoscopy revealed a segment of reddish and swollen small bowel. A biopsy was obtained.

**Figure 5.** Histological examination of the small bowel biopsy revealed fibrinoid necrosis of the vascular wall in a medium-sized vessel (white arrow) and perivascular infiltration of eosinophils.

In a patient with eosinophilia and vasculitis, EGPA is the main possible diagnosis. The other differential diagnosis is hypereosinophilic syndromes (HES) and eosinophilic gastroenteritis. Based on the presence of 4 (asthma, eosinophilia > 10%, extravascular eosinophils, mono- or poly neuropathy) out of the 6 diagnostic criteria of the American College of Rheumatology (ACR), the patient was diagnosed with EGPA (CSS) [4]. Treatment with 1.5–3.0 mg/kg/d (80–160 mg) of methylprednisolone was immediately started. After 3 weeks of this therapy, the patient’s clinical condition remarkably improved. Although the paresthesia of the right hand and both lower legs was still present, the abdominal pain nearly disappeared. Laboratory data showed normalization of white blood cell count (11.8 x 10^9/l; eosinophils: 0.5%). Analysis of urine showed 0–1 RBC/HPF.

**DISCUSSION**

The 2012 Chapel Hill consensus conference defined EGPA as eosinophil-rich and necrotizing granulomatous inflammation often involving the respiratory tract and necrotizing vasculitis predominantly affecting small to medium vessels and associated with asthma and eosinophilia [1]. In 1951, Churg and Strauss first described a syndrome characterized by asthma, fever, eosinophilia, and symptoms of cardiac failure, renal damage and peripheral neuropathy [2]. Most sufferers also developed pulmonary infiltrates, sinusitis, hypertension, abdominal pain, bloody diarrhea, and skin changes including purpura and subcutaneous nodules [2]. In 1990, ACR proposed 6 criteria for determination of CSS, of which at least 4 need to be present for establishing this diagnosis: 1) asthma; 2) eosinophilia > 10%; 3) mononeuropathy or polyneuropathy; 4) paranasal sinus abnormality; 5) non-fixed pulmonary infiltrates; and 6) extravascular eosinophils [6]. The sensitivity of these criteria for diagnosis was 85%, and the specificity was 99.7%. Lanham et al. divided the clinical evolution of Churg-Strauss disease into 3 partially overlapping phases. It begins with a prodromic phase including asthma and allergic manifestations, which is followed by eosinophilic infiltration of tissues and then, years after the onset of asthma, a systemic phase with necrotizing vasculitis [7].

Gastrointestinal symptoms in EGPA include abdominal pain, bloody stools, diarrhea, and nausea and vomiting [4]. In a review of 154 cases reported in the English literature, Lanham et al. found abdominal pain which reflected bowel perforation, peritonitis, intestinal obstruction, mesenteric vasculitis, or cholecystitis to be a common symptom (59% of all cases) [7]. Twenty-one cases of lesions in the gastro-intestinal tract in association with EGPA have been described in the Japanese literature [8]. These lesions were in the form of multiple ulcers located in the stomach, small intestine, and colon. Twelve of these 21 cases presented.
as a gastrointestinal perforation. The small intestine was the most common site of involvement and the one most frequently perforated. Ischemia from vasculitis causes ulcerations, perforations, annular stenosis, and/or intestinal occlusions usually involving the small bowel, and it presents as acute abdomen or intestinal angina [9, 10]. In agreement with these published results, we found esophageal ulcers, antral ulcers, and small bowel vasculitis in our patient.

Histology of the 13 cases examined by Churg and Strauss was quite similar: in most organs, they found tissue eosinophilia, necrotizing and granulomatous vascular lesions, and extravascular granulomas [2]. Histological examination of our patient revealed vasculitis of a medium-sized artery with partial fibrinoid necrosis of the vascular wall and focal aggregation and perivascular infiltration of eosinophils.

Renal manifestations are found in <25% of patients, and they range from isolated urinary abnormalities (i.e., microscopic hematuria and proteinuria) to rapidly progressive glomerulonephritis [11, 12]. Histology shows crescentic necrotizing pauci-immune glomerulonephritis. Cases of ruptured arterial aneurysm of the kidney caused by involvement of larger vessels have been reported [13, 14]. Glomerulonephritis was not likely to be present in our patient who had transient microscopic hematuria and a wedge-shaped infarct of the right kidney on the CT scan.

Two recent independent studies on large cohorts of patients have found that ANCA (usually MPO-ANCA) are present in only about 40% of cases [11, 15]. ANCA were negative in our patient.

Bibby et al. reported that treatment with leukotriene receptor antagonist was suspected as a trigger of EGPA in at least two-thirds of the cases [16]. Our patient had not received leukotriene receptor antagonists in the past.

The differential diagnosis of EGPA includes HES and eosinophilic gastroenteritis. HES are characterized by persistent and pronounced eosinophilia (generally >1500/μl), organ involvement, and absence of “reactive” forms of eosinophilia [17]. Idiopathic HES patients rarely have asthma [18] and vasculitic complications (e.g., purpura, glomerulonephritis, and neuropathy). Furthermore, tissue biopsies do not show vasculitis in idiopathic HES, and ANCA are typically negative [19]. Eosinophilic gastroenteritis is diagnosed based on gastrointestinal (GI) symptoms, pathologically eosinophilic infiltration of the GI tract, absence of eosinophilic involvement of multiple organs outside the GI tract, and absence of parasite infestation [20].

Glucocorticoids represent the mainstay of EGPA treatment. The evidence in favor of the use of additional immunosuppressants is less clear [21, 22, 23]. For salvage treatment of refractory disease, small case series demonstrated the efficacy of intravenous immunoglobulin, interferon-alpha, TNF-alpha (tumor necrosis factor) antagonists, and rituximab [24-27].

In summary, we report here a rare presentation of EGPA that included asthma, intestinal vasculitis, multiple infarcts of the spleen and right kidney, and mononeuritis multiplex. The patient responded well to the corticosteroids treatment alone.

REFERENCES