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Case Report

Eosinophilic Granulomatosis with Polyangiitis Manifested by Cholecystitis and Mononeuritis Multiplex: A Case Report

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Abstract

Eosinophilic granulomatosis with polyangiitis formerly named "Churg-Strauss syndrome (CSS)" is a systemic disease with bronchial asthma, hypereosinophilia, and systemic vasculitis. We report a case of CSS with cholecystitis and mononeuritis multiplex. A 50-year-old woman with a history of sinusitis and bronchial asthma of 8 years' duration was referred with a complaint of left-hand deformity and difficulty in walking. The laboratory findings included remarkable eosinophilia, an elevated erythrocyte sedimentation rate, and a marked eosinophilic infiltration in the gallbladder biopsy. Based on the clinical features and histopathological findings, she was diagnosed with CSS and subsequently treated with prednisolone and cyclophosphamide.

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Keywords • Churg-strauss syndrome • Cholecystitis • Mononeuropathies

What's Known

- Churg–Strauss syndrome (CSS) is a systemic disorder characterized by bronchial asthma, hypereosinophilia, and systemic vasculitis.
- Gallbladder involvement is a very rare comorbid condition in CSS. There are some reports of acute cholecystitis alone or in combination with other manifestations in this disorder.

What's New

- This case highlights a common surgical presentation resulting from a much less common systemic disorder.
- Surgeons should be aware that gastrointestinal and neurological manifestations of CSS can occur and marked peripheral eosinophilia, especially in patients with asthma, should alert the clinician to the possibility of this rare disorder.

Introduction

Eosinophilic granulomatosis with polyangiitis or Churg–Strauss syndrome (CSS) is a systemic vasculitis characterized by bronchial asthma, hypereosinophilia, and systemic vasculitis.[1] The prevalence of this disorder is estimated at 10.7 to 13 cases per million.[2] The histopathological features include necrotizing vasculitis in both veins and arteries with eosinophilic infiltration in the vessels and the surrounding tissues. In up to 50% of the patients, gastrointestinal involvement may occur with such symptoms as abdominal pain, vomiting, and diarrhea.[3] Gallbladder involvement is a very rare comorbid condition in CSS.[4,5] There are some reports of acute cholecystitis alone or in combination with other manifestations in this disorder.[4-11] We herein introduce a patient suffering from CSS with cholecystitis and peripheral neuropathy, treated with cholecystectomy and carpal tunnel syndrome surgery.

Case Presentation

A 50-year-old woman referred to a rheumatologist with a complaint of hand deformity and difficulty in walking, in August 2016. The patient had suffered from bronchial asthma and sinusitis for the previous 8 years. Eight months earlier, she was evaluated for abdominal pain via sonography and magnetic

resonance cholangiopancreatography, and a dilated gallbladder with thickened walls was detected. The lab data at the time included while blood cells of 20100 (26.9% eosinophil), erythrocyte sedimentation rate of 104 mm/h, C-reactive protein of 32 mg/L (up to 10), alkaline phosphatase of 599 IU/L (up to 306), and gamma-glutamyl transferase of 75 U/L (up to 32). A diagnosis of acalculous cholecystitis was made, and she underwent a cholecystectomy. The gallbladder biopsy specimen showed mild flattening and sloughing of the mucosal folding with marked eosinophilic, neutrophilic, and lymphoplasmacytic infiltration in the stroma. Eosinophils filled the blood vessels and infiltrated across the wall (figure 1).

Two months later, left-hand surgery was done for carpal tunnel syndrome. Despite releasing the median nerve, the atrophy and disability of the left hand progressed and difficulty in walking was added because of right-foot pes cavus.

Physical examination was negative for rash, lymphadenopathy, crackle over both lung fields, and cardiac murmurs. Her abdomen was soft and flat, and the scar of the cholecystectomy could be seen. On neurological examination, the patient was alert and oriented with normal cranial nerve functions. Atrophy of the interosseous muscles was found in both hands, with more severity in the left hand and the right foot (figure 2). The laboratory tests are shown in table 1.

Electrodiagnostic study showed confluent sensory motor axonal mononeuropathy multiplex. Echocardiography demonstrated normal chamber size and left ventricular ejection fraction. Lung computed tomography (CT) scan showed patchy ground-glass opacity with a mosaic pattern. CT scan of the abdomen and pelvis did not show any pathological findings in the liver, pancreas, gastrointestinal tract, and colon. Sural nerve biopsy demonstrated mononuclear cell infiltration, especially around the vessels and the perineurium.

On the basis of her clinical features, including history of sinusitis and bronchial asthma, pulmonary infiltration, eosinophilia, and mononeuropathy multiplex, as well as her histopathological findings of eosinophilic vasculitis, a diagnosis of CSS was established.

Treatment was started with 60 mg of prednisolone daily and because of rapid neurological deterioration, cyclophosphamide (1000 mg monthly) was added to the glucocorticoid.

Two weeks later, she noted significant improvements in the upper and lower respiratory tract symptoms, including mucopurulent drainage and nasal obstruction. Leukocytosis and acute-phase reactants also declined.

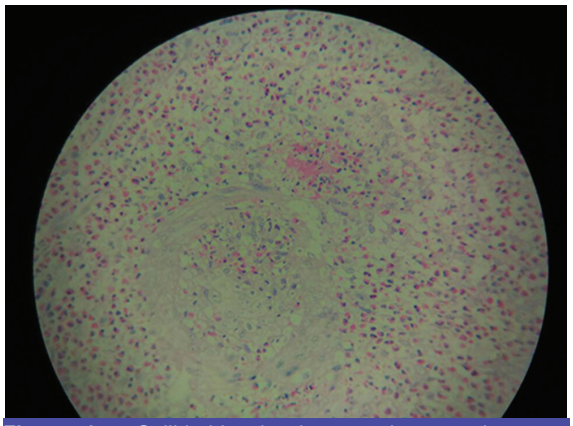

Figure 1: Gallbladder involvement by granulomatous angiitis with eosinophilia. Eosinophilic infiltration is diffuse and nearly pure.

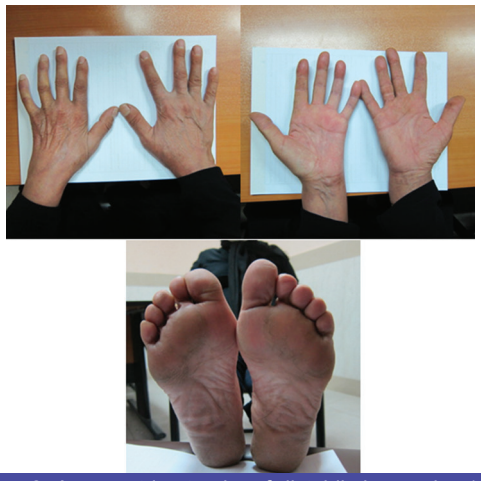

Figure 2: Asymmetric atrophy of distal limb muscles (more obvious in the left hand and right foot) due to mononeuropathy multiplex.

Informed consent was obtained from the patient for the publication of this case report and the accompanying images.

Discussion

CSS is a small-vessel vasculitis with different manifestations in the upper and lower respiratory system, skin, nervous system, heart, kidney, and gastrointestinal system.[12] The gastrointestinal manifestations of CSS include gastroenteritis, ileal or colonic ulcers with subsequent bleeding, ischemia, and perforation. Cholecystitis is a rare manifestation of CSS.[4,5] In this patient, eosinophilic infiltration of the gallbladder wall and blood vessels helped us diagnose cholecystitis.

The classification criteria for CSS comprise asthma, eosinophilia (>10% on differential), mononeuropathy, non-fixed pulmonary infiltrates, paranasal sinusitis, and biopsy containing a blood vessel with extravascular eosinophils. The presence of 4 or more of these 6 criteria yields

Table 1: Laboratory test results of the patient

Laboratory tests	Results
CBC	WBC: 14250 (45.2% eosinophil), Hg: 12.1, Plt: 402000
Acute-phase reactants	ESR: 42 mm/h, CRP: 3 mg/L (up to 10)
Biochemical tests	FBS: 100 mg/dL, creatinine: 0.7 mg/dL, ALT: 13 IU/L, ALP: 185 IU/L, calcium: 9.7 mg/dL
Rheumatologic tests: result and (normal range)	ANA: 1/100 (up to 1/100), anti-dsDNA: 10 IU/mL (up to 100), anti Ro: 0.22 (up to 1.1), anti La: 0.3 (up to 1.1) , C3: 105 mg/dL (90–80), C4: 30 mg/dL (10–40), CH50: 39 units (23–46), ACE level: 43 U/L (8–65), C-ANCA: 1 U/mL (up to 10), P-ANCA: 1.3 U/mL (up to 5), anti MPO: 2.7 RU/mL (up to 20) , anti PR3: 3.6 RU/mL (up to 20), IgE: 49.8 KIU/L (up to 150)
Urine analysis	4–5 WBC, 0–1 RBC, protein of 24 h urine: 32 (up to 150)
Stool examination	WBC and RBC: many, negative for ova or cyst of parasites
Endocrinology: result and (normal range)	FBS: 100, HgA1C: 5.6, TSH: 6.75 mIU/L (0.5–5.5)
Virology	HBs Ag (ECLIA): Neg, HCV Ab (ELISA): Neg

Table 2: Summary of the case reports on cholecystitis in Churg–Strauss syndrome

Author (Reference No)	Age/Sex	Asthma	Eosinophilia (% or/mm^3)	Mononeuritis	ANCA test	Other manifestations	Treatment
Tatsukawa[5]	50/F	+	35%	+	Anti MPO	Glomerulonephritis	Prednisolone
Nishie[8]	36/M	-	17000	+		Duodenitis	Prednisolone
Suzuki[10]	21/F	+	56%	-	-	Liver abscess	Prednisolone
Yuksel[11]	65/M	-	39%	-		Active interface hepatitis	Prednisolone
Francescutti[6]	38/F	+	12000	-	-	-	Prednisolone
Lenders[7]	31/F	+	8300	-	-	Cardiac tamponade	Prednisolone
Ye[4]	49/M	-	57.2%	+	-	Gastric ulcers	Prednisolone
Curent case	50/F	+	45.2%	+	-	-	Prednisolone and cyclophosphamide

a sensitivity of 85% and a specificity of 99.7%.[1] Our patient exhibited all the described features.

Coarse granular and perinuclear antineutrophil cytoplasmic antibodies (ANCAs) can be detected in 38% to 50% of the patients.[6] There are some hypotheses about the existence of 2 types of CSS based on the presence or absence of ANCAs. Renal involvement, neuropathy, alveolar hemorrhage, and vasculitis with purpura are the predominant manifestations in ANCA-positive patients, while cardiac and pulmonary involvements are the predominant complaints in ANCA-negative patients.[12] In this case, C- and P-ANCA, anti-proteinase 3 (anti PR3), and anti-myeloperoxidase (anti MPO) were negative similar to some other cases (table 2).

Limited, non-severe CSS can initially be treated with glucocorticoids alone; nonetheless, patients with life-threatening manifestations and/or major organ involvement should receive a combination of glucocorticoids and an immunosuppressant, mainly cyclophosphamide.[13] In this case, cyclophosphamide was added because of gastrointestinal involvement and progressive and disabling confluent mononeuritis multiplex.

Conclusion

This case highlights a common surgical presentation resulting from a much less common systemic disorder. Surgeons should be aware that the gastrointestinal and neurological manifestations of CSS can occur. Marked peripheral eosinophilia, especially in patients with asthma, should alert the clinician to the possibility of this rare disorder.

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Conflict of Interest: None declared.

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