Pericardial Effusion as an Extra-intestinal Manifestation of Inflammatory Bowel Disease in a Child

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Abstract

We report a case of a 12-year-old boy with a recent diagnosis of ulcerative colitis, who presented with chest pain, shortness of breath, and fever shortly after discontinuing oral prednisolone. Upon further investigation, he was found to have a pericardial effusion. Comprehensive diagnostic work-up, ruled out other potential causes of the effusion such as infection, autoimmune conditions, or malignancy. The patient responded well to the supportive therapy, including the resumption of his treatment with immunosuppressive medications, leading to resolution of the pericardial effusion. This case underscores the importance of recognizing pericardial effusion as a potential, though rare, complication of inflammatory bowel disease in pediatric patients. It also highlights the need for a thorough evaluation in such patients presenting with chest symptoms, as prompt identification and treatment are critical for preventing complications.

Keywords: Inflammatory Bowel Disease; Child; Pericardial Effusion.

Introduction

Ulcerative colitis (UC) is one type of inflammatory bowel disease (IBD) in children. It is a relapsing remitting condition that is associated with a wide range of both intestinal and extraintestinal manifestations. Myo-pericardial manifestations are rare but potentially serious complications of IBD.[1] In UC, myo-pericardial diseases have been described both as a side effects of IBD medications and as an extra-intestinal manifestation of the disease[1-2.] Here we report a 12-year-old male child with UC who developed pericardial effusion as an extraintestinal manifestation of IBD.

Case Report

A 12-year-old male patient was diagnosed with UC three weeks ago. Initially, he presented with a three-month history of abdominal pain, weight loss (12% of his body weight), and bloody diarrhea. He was initiated on azathioprine, mesalazine, a 5-aminosalicylic acid,(5-ASA) and prednisolone (which he self-ceased after five days). His symptoms improved with the treatment. Two weeks later, the patient presented to our emergency department with one-week history of fever, associated with dry cough, shortness of breath, and mild chest pain. Additionally, there was a worsening of his gastrointestinal symptoms. He reported frequent bloody stools (up to five times per day), vomiting, and mild abdominal pain. The pediatric ulcerative colitis activity index (PUCAI) at the time was 30. The physical examination revealed normal anthropometric parameters, accompanied by mild conjunctival pallor. Abdominal examination showed tenderness in the left iliac fossa. Cardiac examination detected soft S1 and S2 heart sounds, and

a friction rub in the left lower sternal border. Investigations revealed a low hemoglobin level of 8 g/dL (11.5 – 15.5), with picture of iron deficiency anemia, along with thrombocytosis (Table 1). Elevated inflammatory markers were observed, including a C-reactive protein (CRP) level of 183 mg/L (0-5) (Table 1). Albumin level was low at 34 g/L (38-54) with normal transaminases. Cardiac enzyme analysis demonstrated elevated cardiac-specific creatinine kinase creatine kinase-myocardial band (CK-MB) at 83.3 U/L (0.0 - 25.0), while troponin T remained within the normal range (Table 1). A chest x-ray illustrated cardiomegaly (Figure 1). The electrocardiogram (ECG) displayed a normal sinus rhythm. An echocardiogram revealed moderate pericardial effusion primarily in the inferior-posterior aspect of the left ventricle, containing fibrin strands and a bright pericardium, with the fluid measuring approximately 2 cm to 2.6 cm with no evidence of cardiac tamponade with normal cardiac function (Figure 2 A and B). The presence of increased echogencity and brightness of the effusion with speckled patterns due to the presence of fibrin are features of chronic effusion.

Table 1: The patient's blood tests at the diagnosis, showing negative investigations for any infective and non-infective causes of pericardial effusion.

Blood test	Result	Reference range
Haemoglobin g\L	88	115 - 155
Whit cell count 10^9/L	11.7	4.5 - 14.5
Platelets 10^9/L	685	150 - 450
Creatinine kinase (CK) (Total) U\L	54	39 - 308
Creatinine kinase- MB (CK-MB) U\L	83.3	0.0 - 25.0
Troponin T ng/L	< 3	< 14
N-terminal pro-BNP pg\mL	769	20 - 160
C-reactive protein (CRP) mg/L	183	0-5
Lactate dehydrogenase (LDH) U\L	193	120 - 300
Thyroid stimulating hormone (TSH) mIU/L	0.64	0.51 - 4.30
Anti-double stranded DNA (Anti-ds DNA) IU/ml	2	0 - 9
Complement 3 g\L	1.83	0.90 - 1.80
Complement 4 g/L	0.27	0.10-0.40
Urea umol/L	3.8	2-8
Creatinine umol/L	49	30-60
Antinuclear antibodies (ANA) and *Extractable nuclear antigen (*ENA)	Negative	
Human immunodeficiency virus (HIV) serology	Negative	
Blood and urine cultures	Negative	
Stool microscopy, culture and parasite	Negative	
Stool viruses	Negative	
Respiratory Viral Screen and Throat Swab culture	Negative	
Epstein-Barr virus, Cytomegalovirus and Enterovirus PCR	Negative	
Anti-Streptolysin O Test	Negative	
Brucella Antibody Titer	Negative	
Coxiella Burnettii Serology	Negative	

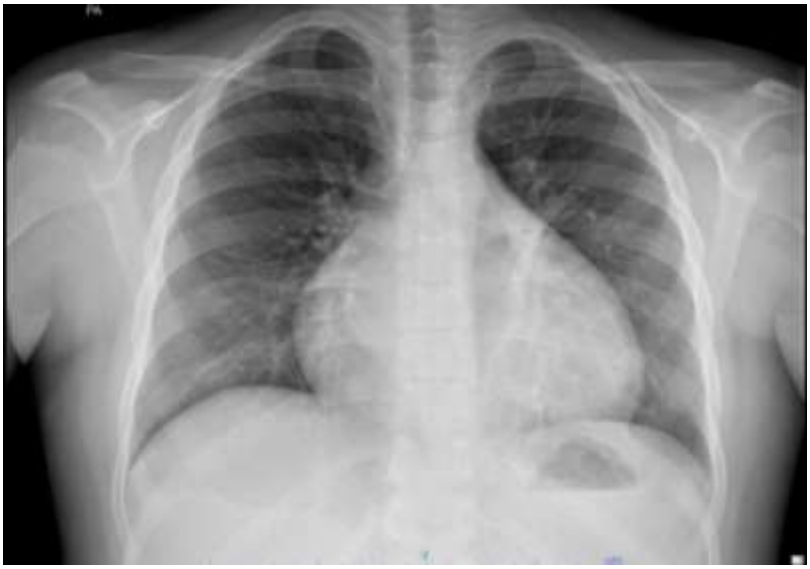

Figure 1: PA view of the chest X-ray showing cardiomegaly with cardiothoracic ratio of 0.58 with normal lung field, hila and mediastinum.

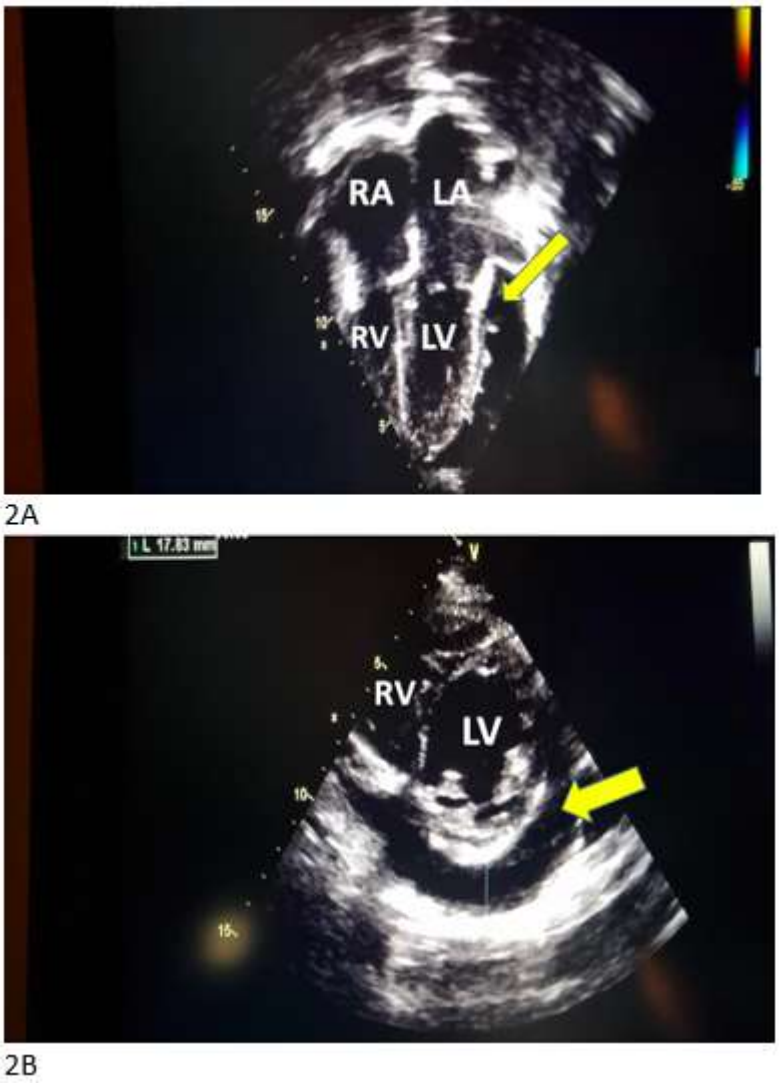

Figure 2: Echocardiography at presentation. A: Echocardiographic 4 chamber view at presentation showing moderate pericardial effusion (arrow), RA: right atrium, LA: Left atrium, RV: right ventricle, LV: left ventricle) B: Echocardiographic parasternal short axis view showing moderate pericardial effusion (arrow) RV: right ventricle, LV: left ventricle)

The patient was admitted and initiated on methylprednisolone at a dosage of 1 mg/kg/day for 3 days which subsequently changed to oral prednisolone. Colchicine was introduced later but discontinued due to a deterioration in gut symptoms. Comprehensive investigations, including infection screening and autoimmune work-up (Table 1), ruled out alternative causes of pericardial effusion. Pericardiocentesis was declined by the family due to the possible complications of the procedure and in the absences of the cardiac tamponade. The patient's symptoms improved leading to discharge with oral therapy for ulcerative colitis (Mesalazine, azathioprine, and prednisolone). However, during subsequent outpatient clinic follow-up visits two weeks later, the patient unfortunately reported a worsening of gut symptoms. In response, the patient was initiated on infliximab therapy after evaluating the benefit of infliximab versus the possible risk of cardiac side effects. This has resulted in a significant improvement in symptoms. From cardiac perspective, he remained asymptomatic. Cardiac examination revealed neither murmurs nor pericardial friction rub. A repeated echocardiogram showed normal left ventricular systolic function and the absence of pericardial effusion (Figure 3). The patient ulcerative colitis symptoms were controlled on the current measures with PUCAI

score under 10. He also reported no more cardiac symptoms since the initial presentation. His cardiac enzymes, chest X- ray and echo were normal at 12 months- follow-up.

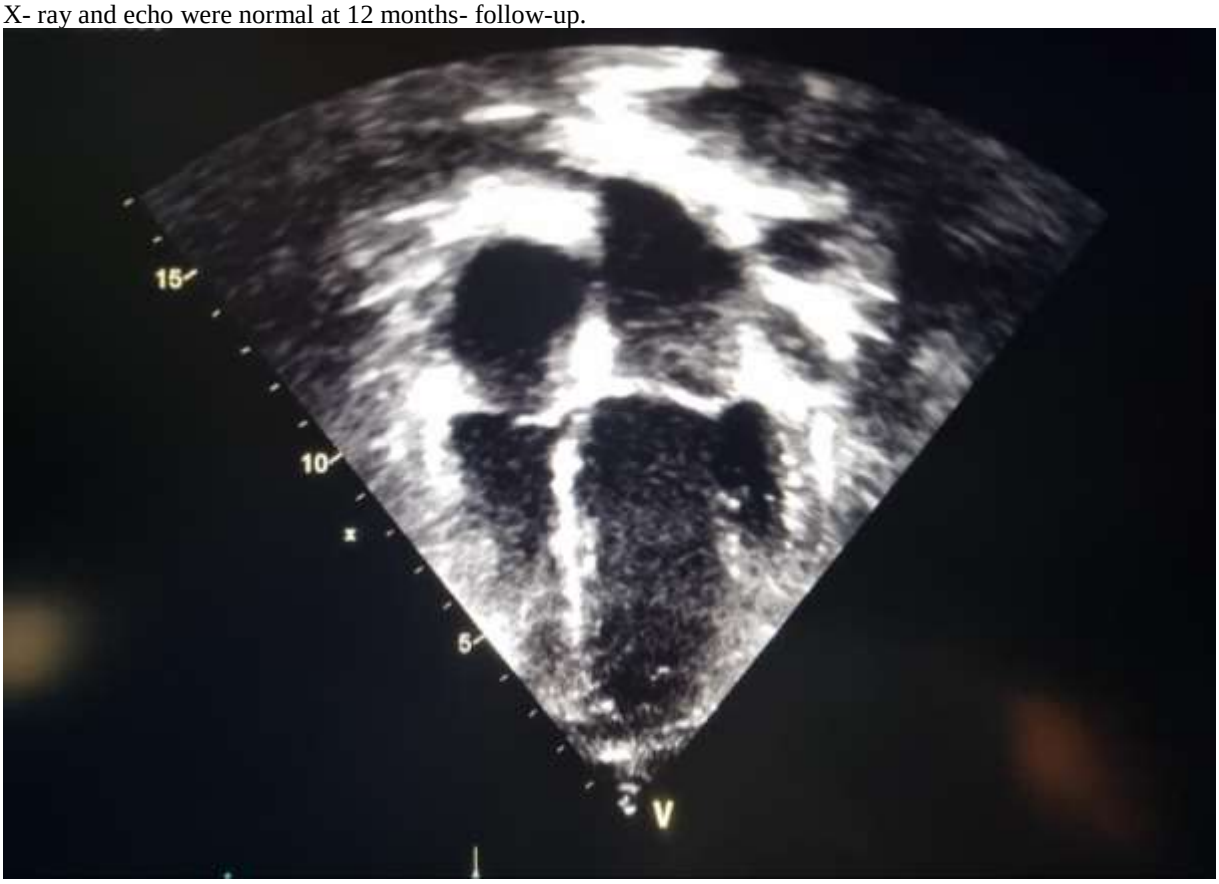

Figure 3: Echocardiography after six weeks. Echocardiographic 4 chamber view showing complete resolution of the pericardial effusion: RA: right atrium, LA: Left atrium, RV: right ventricle, LV: left ventricle.

Discussion

Inflammatory bowel disease (IBD) is a chronic dysregulated immune mediated disease of the gut.[1] Extra intestinal manifestations affect 30% of IBD patients.[2] One of the rare extra intestinal manifestations is cardiac involvement.[1-9] Cardiac manifestations of IBD includes endocarditis, myocarditis, pericarditis, pericardial effusion and arrhythmias. It is potentially a serious complication, therefore, chest symptoms in patients with IBD should be evaluated seriously to exclude myo-pericardial disease. IBD -associated pericarditis itself is rarely seen in pediatrics age group with a prevalence of 0.23% in UC patients and 0.19% in Crohn's disease.[1-3] In reviewing the literature, we found that most of the reported cases were drug-induced pericarditis[2] and few of them presented as an extra-intestinal manifestation of IBD.[2] Pericardial effusion can be due to infectious causes and non-infectious causes like drug-induced, systemic disease-related, or idiopathic.[2] As IBD-associated pericardial effusion considered a diagnosis of exclusion m it is crucial to rule out secondary causes of pericardial effusion.[5] In our patient, investigations were negative for other causes. In addition, the prompt response to steroid re-initiation is another prove of the diagnosis. Myo-pericardial involvement in IBD can be due to drug adverse such as 5-aminosalicylic acid (5-ASA) and sulphasalazine.[1,2,4-6,9,11] Additionally, sulphasalazine itself can cause drug-induced lupus that can manifest with pericardial disease.[5] Pericarditis usually presents within few weeks after initiating the treatment, unless the patient is taking, methylprednisolone therapy that can delay the onset of pericarditis.[1,2,11] In our patient, 5-ASA was commenced few weeks prior to the onset of the chest pain. Interestingly, despite the continuation of 5-ASA, the patient's symptoms improved, rendering it an unlikely culprit for his condition. Infliximab is another example of IBD-medication that can induced pericarditis.[4,6,7] Therefore, our patient was closely monitor for cardiac adverse reactions after initiating

infliximab. Although in our patient the onset of clinical symptoms of pericardial effusion was associated with exacerbation of ulcerative colitis, the echocardiogram findings were heading toward the chronicity of pericardial involvement in this patient. This corresponds with what have been reported previously in the literature that the manifestation of pericarditis might not run parallel course with the UC disease activity.[2,5,8,10] It is essential to recognize such a rare complication of IBD and its possible etiology. Management consists of suspending the possible culprit drug or, as in our case, using steroid and other therapy used to treat IBD with close monitoring of possible recurrence of the symptoms.

Conclusion

Cardiovascular manifestations of IBD is an extremely rare entity in children. It should be considered as a potential life-threatening extraintestinal manifestation of UC and be treated accordingly. This case report highlights the importance of considering such rare manifestation and the importance of thoroughly investigating any IBD patient who presents with chest symptoms to rule out other etiologies of pericardial effusion. Management of pericardial effusion in IBD consist of symptomatic management in addition to conventional IBD therapy.

Disclosure

The authors have nothing to declare. The parents consented for the publication of the case report. No ethical approval is required for case report publication at our institute.

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