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Case Report

Rare Presentation of Unusual Combination: Pleural and Pericardial Effusion as First Presentation of Concomitant Celiac Disease and Crohn's Disease in a Child

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Abstract

Celiac disease and Crohn`s disease development reflect the interactions between genetic predisposition and environmental factors. Concomitant presence of the two disorders is rare. The shared symptomatology between the two diseases makes it difficult to identify which disease is responsible for the manifestations` development.

Keywords: *Rare Presentation; Pleural and Pericardial Effusion*

Introduction

Celiac disease and Crohn`s disease development reflect the interactions between genetic predisposition and environmental factors [1]. Concomitant presence of the two disorders is rare. The shared symptomatology between the two diseases makes it difficult to identify which disease is responsible for the manifestations` development [2].

Pleural and pericardial effusions as extraintestinal manifestations are rare presentations of both disorders. Pathophysiologically; deposition of circulating immune complexes at the pericardium is responsible for the development of effusion. We here demonstrate the presence of tTG Antibodies in the pleural fluid of a child presented with pleural and pericardial effusion and turned to be a celiac and crohn`s patient, proving that tTG is contributing to this involvement.

Case Report

A 12-year-old boy presented with a week history of cough, shortness of breath, chest pain and fever. He had a previous similar attack a month ago, when he was diagnosed as pericardial effusion and discharged on Ibuprofen. The mother mentioned complained of fatigability, poor appetite and unsatisfying weight gain and loose motions.

On examination; he was in respiratory distress, tachycardic but afebrile. He had decrease air entry on left side with no added sounds, heart sounds were muffled with no murmurs or rub. His growth parameters were below the fifth centile. He had no lower limb edema but fingers and toes showed clubbing.

His laboratory investigations showed elevated WBCs and inflammatory markers. His Lytes, liver chemistries were normal. His serum albumin was normal and his urine dipstick showed no proteinuria.

Chest X-ray showed pleural and pericardial effusion. Chest CT-scan confirmed the presence of bilateral pleural effusion, in addition to the cardiomegaly and pericardial effusion (Figure 1). He was started on intravenous ceftriaxone and vancomycin. His cardiac evaluation proved the presence of the pericardial effusion required no drainage. He had no structural heart lesions.

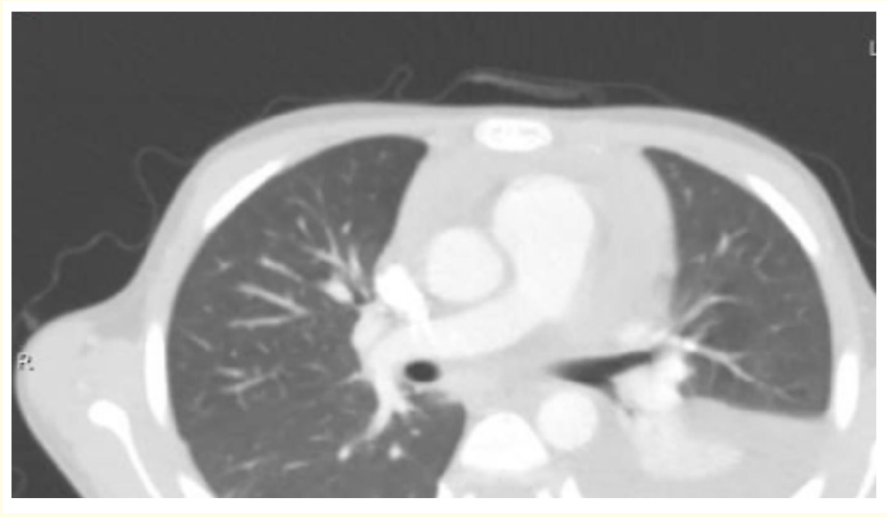

Figure 1: *Chest CT scan:*
Moderate left sided pleural effusion is noted with no evidence of empyema.
Multichamber cardiomegaly with moderate pericardial effusion measuring about 8 mm in its maximum thickness.

Chest tube inserted, fluid was drained. Fluid analysis showed exudative effusion. Microbiological evaluations including Tuberculosis were negative.

His immunological and rheumatological workup; including FMF genotyping came back negative. His anti-tissue transglutaminase-IgA came back positive (114 units (nl. <10), while his ANA came also positive with a low titer. tTG IgA level was tested at the pleural fluid and came back high (67 units).

The patient then underwent upper and lower endoscopy. His upper endoscopy showed antral gastritis and a duodenal ridging and scalloping. The lower endoscopy showed normal left colon, while the right side, cecum and terminal ileum showed multiple aphthous ulcers with areas of inflamed mucosa and loss of vascular markings.

The stomach biopsies confirmed active *H.pylori* gastritis, while duodenal biopsies showed villous atrophy and intraepithelial lymphocytosis consistent with celiac disease (Figure 2A). On the other hand the ileal biopsies showed surface ulcerations, diffuse crypt distortion with inflammation, consistent with Crohn`s disease (Figure 2B).

Patient started on triple therapy for the *H.pylori* gastritis, gluten-free diet and steroid (40mg daily, tapered over 10 weeks) with thiopurine (1.5 mg/Kg divided into 2 doses). His symptoms improved markedly. His last follow up at four months post hospital discharge; he was doing very well, he added 2 Kgs of weight with no respiratory or cardiac manifestations. His inflammatory markers normalized and Anti- tTG IgA turned negative (Figure 2).

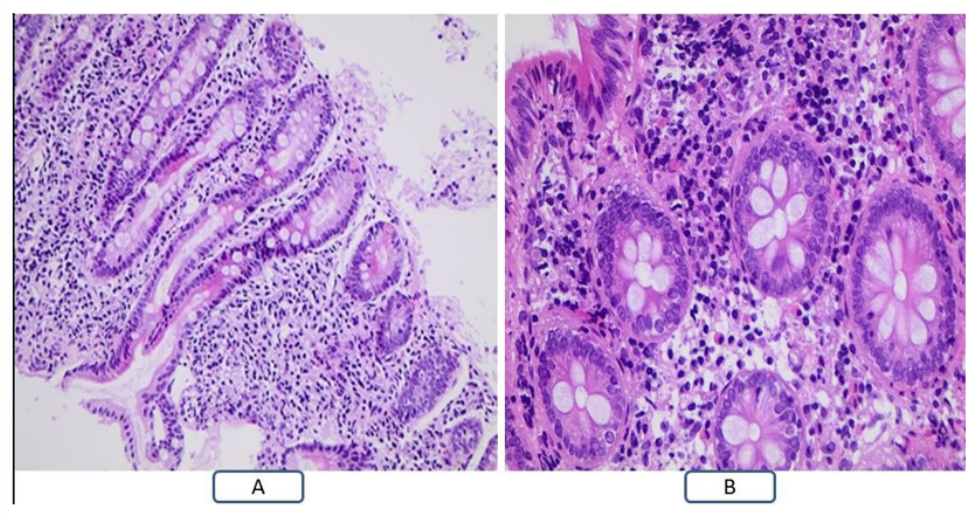

Figure 2: *Histopathology of the duodenal and ileal biopsies.*
A: fragment of duodenal mucosa shows marked villous atrophy with crypt hyperplasia and intraepithelial lymphocytosis. The overall histologic features are consistent with celiac disease, Modified Marsh Classification of histologic findings in celiac disease (Oberhuber): Grade 3b. B: Fragment of terminal ilium mucosa with diffuse distortion of crypt architecture and marked increase in the lamina propria content of mixed acute and chronic inflammatory cells, consistent with active ileitis.

Discussion

We are here reporting an unusual presentation of a rare combination. Celiac disease and Crohn`s disease are chronic immune mediated diseases of the gut. Both diseases reflect the interactions between genetic and environmental factors [1]. The gastrointestinal manifestations (chronic diarrhea, failure to thrive and malnutrition) and even extraintestinal manifestations (pulmonary, cardiac and rheumatological) not totally discriminative between both diseases [2]. The Concomitant presence of the two diseases is not unusual. Crohn`s disease is reported in up to 3.2% of celiac patients, while celiac disease occur in almost 1% of Crohn`s patients [3].

In our patient; celiac disease diagnosis confirmed with positive serology (tTg IgA and EMA, positive with the titer > 10X the normal of our lab, with endoscopic and pathological features. On the other hand, Crohn`s disease confirmed by the endoscopic patchiness of the disease and terminal ileitis, with histopathological features.

The argument of that the duodenal involvement is simply a manifestation of Crohn`s disease is still valid. Especially with the fact that crohn`s patients might have positive celiac serology [4].

We believe that the high titer of tTG (>10X normal is pointing toward CD). In addition, adding weight on Gluten-free diet and dropping titer of tTG in support of Celiac disease. Unfortunately, HLA-typing is not available in our facility which might help resolving this dilemma.

Pericardial effusion is well-described in patients with celiac disease. Grasso., *et al*. reported pericardial effusion to be present in 20% of a selected group of their celiac patients (6/5).

On the other hand; pleuro-pericarditis is described in almost. 2% of patients with crohn`s disease [6] It is believed that deposition of circulating immune complexes originating from the patient intestine at the pericardium is responsible for the development of pericarditis

and effusion [7]. This pathogenesis is the postulated mechanism in the both illnesses. This adds to the confusion of which disease is responsible for the development of pericardial and pleural effusion. As the pleural effusion needed drainage but the pericardial effusion not, we decided to test for tTG IgA in the drained fluid. For our surprise, the tTg IgA test came back positive with a titer (57 unit). We believe this supported the suggested pathogenesis of development of serositis and pointed toward celiac disease to be the guilty one.

	Value	Normal range
WBC Neutrophils% Lymphocytes % Eosinophils%	16.6 * 10^3 /mm^3 75% 14.4% 0.8%	4-11 * 10^3/mm^3 60-75% 20-45% 1-3%
Hemoglobin	11 g/dl	11.2-16.5 g/dl
Hematocrit	33.4%	30-42%
Mean corpuscular hemoglobin conc.	33 g/dl	31-37 g/dl
Mean cell hemoglobin	21.2 pg	27-35 pg
Mean cell volume	64.4 um^3	78-100 um ^3
Platelets	365 * 10^3/mm^3	150-400 * 10^3/mm^3
Mean platelet volume	9.3 um ^3	6-10 um^3
Red cell width	24.5%	11.5-17%
Red blood corpuscles	5.19*10^6/mm^3	3.5-5.2*10^6/mm^3
Sodium	137 mmol/l	135-153 mmol/l
Potassium	4.02 mmol/l	3.1-5.1 mmol/l
Urea	1.5 mmol/l	1.79-6.43 mmol/l
Creatinine	18 umol/l	27-62 umol/l
Total protein	71.4 g/l	60-80 g/l
Albumin	38 g/l	38-54 g/l
Total bilirubin	6.8 umol/l	5-21 umol/l
Direct bilirubin	3.5 umol/l	<3.4 umol/l
Alanine transaminase	9.7 U/l	0-41 U/l
Aspartate aminotransferase	15.7 U/l	0-40 U/l
Alkaline phosphatase	163 U/l	129-417 U/l
Gamma GT	10 U/l	8-61 U/l
Calcium	2.39 mmol/l	2.2-2.7 mmol/l
Magnesium	0.76 mmol/l	0.7-0.86 mmol/l
Phosphorus	1.38 mmol/l	1.05-1.85 mmol/l
T3	3.82 pmol/l	3.1-6.8 pmol/l
T4	19.98 pmol/l	12-22 pmol/l
TSH	2.37 mIU/L	0.27-4.64 mIU/L
C reactive protein (CRP)	71.09 mg/l	0-5 mg/l
Erythrocyte sedimentation rate(ESR)	60 mm/I hr	0-20 mm/I hr
Complement C3	152 mg/dl	90-180 mg/dl

Complement C4	46 mg/dl	10-40 mg/dl
Anti tissue transglutaminase IgA	127 IU/ml	<10 IU/ml
Anti nuclear body (ANA)	Positive	
Rheumatoid factor(RF)	Negative	
Anti DNA	Negative	
Anti Smith	Negative	
Anti JO1	Negative	
Anti RNP	Negative	
Anti Scl 70	Negative	
Anti SSA	Negative	
Anti SSB	Negative	
Vitamin D	45.5 ng/ml	>30 ng/ml
Ferritin	67.71 ng/ml	7-140 ng/ml
Folate	11.84 ng/ml	4.5-32.2 ng/ml
Vitamin b12	525 pg/ml	197-771 pg/ml

Table 1: *Summary of the patients` investigations upon presentation.*

One further suggested mechanism for development of pericardial disease in celiacs is the endocrinopathies associated with autoimmune disorders, namely thyroid disorders [7] In our patient endocrine evaluation including thyroid function was normal.

Numerous studies pointed to the link between chronic infection with *H.pylori* and cardiovascular diseases [8]. In our case, we believe that *H.pylori* infection is a coincidence rather than a true contributor to the patient condition. As Jordan is an endemic area with H.pylori, in a recent study on asymptomatic children of North Jordan using UBT testing, almost 15% tested positive. (Unpublished work of the first author).

Conclusion

Unexplained serositis (pericardial +/- pleural) can be the first presentation of celiac disease even if no hypoalbuminemia present. Concomitant occurrence of inflammatory Bowel disease and celiac disease is not that rare and may be need to be considered when the clinical picture is not fully explained by either of them.

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