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Case Report

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Report of a case diagnosed with celiac disease after being afflicted with disseminated esophageal and pulmonary candidiasis

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Abstract

Introduction: Celiac disease (CeD) is the most prevalent enteropathy. Candida albicans might be one of the main trigger factors for celiac disease.

Case Report: In this paper, the case of a male patient with esophageal and pulmonary candidiasis is presented. The patient referred to the hospital with hematemesis, hemoptysis, and weight loss, all of which began to improve after the start of treatment with antifungal drugs.

Conclusion: Based on the results of the investigations, the final diagnosis was determined to be celiac disease.

Keywords: Celiac disease, Lung Diseases, Fungal, Systemic candidiasis

Introduction

Celiac disease (CeD) is one of the most prevalent autoimmune disorders. It is an enteropathy that is highly associated with extraintestinal manifestations (EIMs) [1]. Lung involvement rarely occurs in this disease [2]. Fungal infections are caused by various types of fungi that can affect different parts of the body, such as the skin, nails, and lungs. Celiac disease is an autoimmune disorder in which the consumption of gluten leads to damage to the small intestine. The exact relationship between fungal infections and celiac disease is not fully understood, but some studies have suggested that there may be a link between the two. In some cases, fungal infections can exacerbate or trigger autoimmune diseases such as celiac disease.

Its prevalence rate has been reported to be 0.5% to 1% of the population. Tissue transglutaminase (tTG) is usually used for its diagnosis [3]. TG enzyme has been observed in human tissues and candida albicans (C. albicans) cell wall, and it seems that the presence of this enzyme in human tissues can cause CeD [4, 5]. In this report, we present the case of a patient with disseminated esophageal and pulmonary candidiasis who was successfully treated with fluconazole and caspofungin and was finally diagnosed to have been afflicted with celiac disease.

Case presentation

The patient was a 33-year-old man from Ardabil (a city in the northwest of Iran). He was married and had a child. He had no history of such diseases. He referred to the hospital with the chief compliant of hematemesis containing bright blood in the past 3 days. The patient had white lesions in his oral cavity which, as he mentioned, prevented him from eating food and resulted in a weight loss of 13 kg in the course of one month. He also mentioned that during the day before, he observed blood streaks in his mucus following

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coughs and skin lesions (in the form of petechiae and purpura in the lower extremity) appeared. He had no history of using herbal drugs or nutritional supplements, food or drug allergy, smoking, drug abuse, contact with pets, or urticaria. Moreover, he had not traveled to other places recently. The patient did not mention symptoms associated with common cold, fever and shivering, or myalgia.

In physical examination, he was alert and oriented. It was Ill. Vital signs: blood pressure: 105/65 mm Hg, Respiratory rate:16 per minute, Heart rate: 121 per minute, Body temperature: 37.1centigrad. The white lesions in the oral cavity as well as the petechiae and purpura in the lower extremity in anterior and inferior parts of the legs were observed. Considering hematemesis, endoscopy was performed on the patient, the results of which showed disseminated esophageal and pulmonary candidiasis (Figure 1).



Figure 1. Disseminated esophageal and pulmonary candidiasis

In the tests upon hospitalization, the patient was detected to have high blood sugar levels while he had no history of diabetes or corticosteroid consumption. High ESR and thrombocytopenia were also reported for the patient. Regarding the presence of petechiae and purpura in the patient's lower extremity, he was tested in terms of vasculitis, for which the results were negative (Table 1).

Table 1: The patient's laboratory results

Test	Results (Admit)	Results (discharge)	RV
White blood cells	13.9* 10^3	9.8*10^3	4–11 x 10^3 /mm^3
Neutrophil	97	59	%
Lymphocyte	3	21	%
Monocyte	0	15	%
Hemoglobin	14.1	12.8	14-18 g/dL
Hematocrit	39	37	40-57%
MCV	85	87	80-100 femtoliter
Platelet	32*10^3	506*10^3	150450×10^3 cumm
AST	146	23	5–40 IU/L
ALT	222	65	5–40 IU/L
ALP	192	247	80–306 IU/L
Bilirubin Total	2.69	0.8	0.1-1.2 mg/dl
Bilirubin Direct	1.4	0.3	0.3-0.8 mg/dl
PT	13		11-13.5 sec
INR	1.1		
PTT	30		25-40 sec
TSH	0.8	0.9	0.35-4.94micIU/m
Na	135	142	132-145meq/l
k	3.9	4.2	3.7-5.5meq/l
Retic count	0.4		
ESR	72	32	0-25mm/hr
CRP	+3	+1	
Cr	1	0.7	0.7-1.2mg/dl
Urea	30	31	15-45mg/dl
BS	380	110	72-99mg/dl
U/A	NL		
HIV1+2 A (By Elisa GB 3th)	Neg		Qual
HIV Agp 24	Neg		
COVID PCR	Negative		
Galactomannan Ag	0/3(NEG)		<0.5
P-ANCA	2.3(Neg)		0-18u/ml
C-ANCA	3.8(Neg)		0-18u/ml
FANA	neg		
Pro-calcitonin	0.28		
GBM Ab	Neg		
Anti TTG-IgG	Neg		
DSDNA	3.4(Neg)		0-18 u/ml
HBC Ab-IgM	Neg		
Troponin I-hs	0.003		<0.033ng/ml
CH50	115		%90-100
HBSAg (By Elisa GB 3th)	Neg		Qual
HCV Ab (By Elisa GB 3th)	Neg		Qual
Urine Cr/24hrs	731		600-1800 mg/24hrs
Urine Prot/24hrs	340		40-150 mg/24hrs
Urine Volume/24hrs	1700		800-2000ml
B/C*3	Neg		

Due to hemoptysis, a CT scan of the lung was requested for the patient, and in the middle lobe of the lung, there were evidences of alveolar consolidation measuring 27x25 mm with central cavitation and peripheral ground glass opacity in the parenchyma of the left lung, several similar foci measuring 26x30 mm and rounding ground glass opacity in the parenchyma of the lower lobe. And the thickening of the interlobular septa of the left lung was observed (Figure 2).

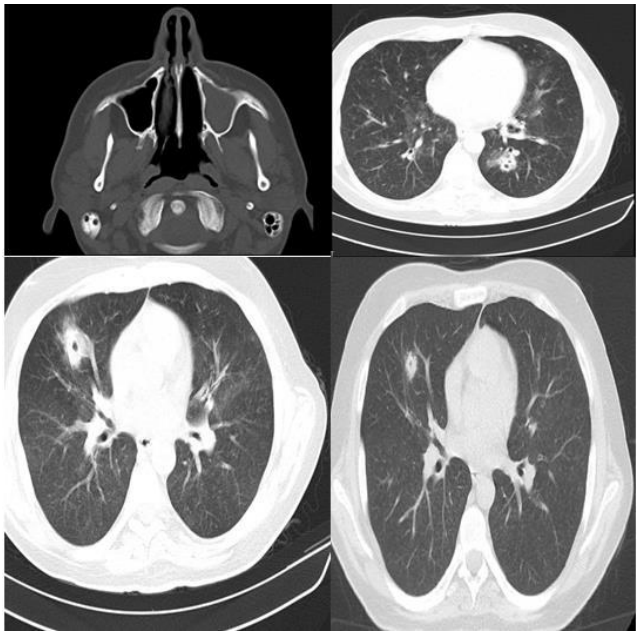


Figure 2. Multi images of the patient's CT scan (Para nasal and Chest), before and after treatment

To check the possibility of fungal infections in the lung and detecting the cause of weight loss and high ESR, the patient was assessed for underlying malignancies. Considering the COVID-19 pandemic, COVID-19 and influenza PCR tests were also requested for the patient, the results of which were all negative. Colonoscopy results did not show any pathological findings. The results of HIV and viral hepatitis tests were frequently reported negative. Except for grade 2 fatty liver, the ultrasound images of liver and bile ducts did not show any other pathological findings. The results obtained from the CT scans of abdomen and pelvises were normal. Echocardiography results were also normal; therefore, the possibility of endocarditis was ruled out. For the treatment of lung lesions, the patient was started on fluconazole and caspofungin. During hospitalization, the patient's thrombocytopenia and skin lesions improved and his blood sugar level returned to the normal range. In the second round of colonoscopy, several erosions were observed in D2. Then, biopsy was performed (Figure 3).

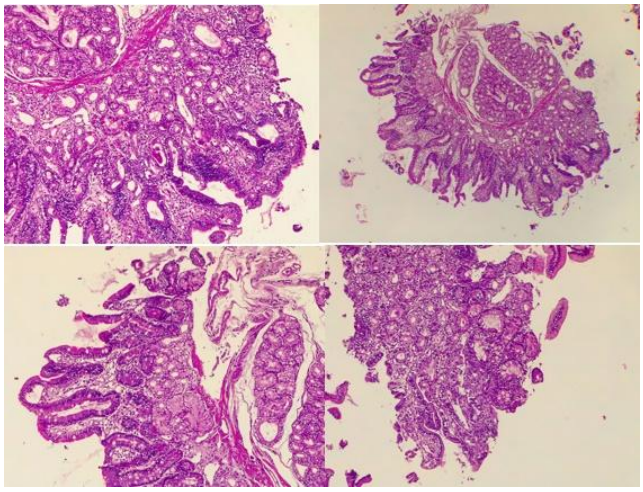


Figure 3. Pathological images of duodenum biopsy

Based on the obtained results, the final diagnosis was determined to be CeD (Marsh 3)

Discussion

CeD is a T-cell-mediated autoimmune disorder of the small intestine. It develops in reaction to the consumption of gluten, a type of protein found in barley, wheat, and rye [6]. The HWP1 protein existing on the surface of C. albicans is very similar to the proteins existing in gluten. The sequence of HWP1 protein, which is expressed in the pathogenic phase of C. albicans, is similar to that of gluten gliadin protein. It also provides a basis for the development of transglutaminase. This finding led to the confirmation of the hypothesis that infection with C. albicans might be a trigger factor for CeD [5]. Using recombinant HWP1 in ELISA, Corouge et al. were the first researchers to indicate the serological cross-reactivity between C. albicans antigen and gliadin in human beings [5].

C. albicans lives in human intestines [7]. It has been demonstrated that the colonization of C. albicans increases in reaction to dysbiosis in the intestine, and homeostatic microbiome exerts an inhibitory effect on the adhesion, colonization, and invasion of candida

[8]. In other words, HWP1 protein appears only when C. albicans takes the form of a fungus [9]. It is maintained that the transition from yeast to hyphal morphology lays the groundwork for most of the changes that occur in various host tissues [10].

In the study conducted by Mouzan et al., fungal dysbiosis was reported in children afflicted with CeD. This finding indicated the possible role of fungal dysbiosis in the pathogenesis of CeD [11]. The presence of candida in CeD might trigger a weak immune response. At least in susceptible individuals, this might lead to an increase in inflammation and villous atrophy. However, the conditions in the gastrointestinal tract are highly conducive for the development of C. albicans [12].

The patient under investigation in this study did not have history of CeD or its extra-articular symptoms. It seems that this patient has contracted CeD after being afflicted with candidiasis, the reason for which might be genetic predisposition. Considering the patient's weight loss and high ESR, a careful diagnostic workup was performed on him for malignancies. The results, however, were negative. After starting treatment with antifungal drugs, the patient's symptoms started to improve. Also, the second round of CT scan and endoscopy indicated that fungal lesions had been completely removed.

Conclusion

Based on the results of this case study, it seems that candidiasis has been the trigger for CeD in the patient under investigation. Through tricking the immune system into invading the proteins in the gluten, candidiasis can initiate a long-lasting sensitivity to gluten. It seems that the patient presented here has contracted CeD after being afflicted with candidiasis, the reason for which might be his genetic predisposition.

Informed Consent

Written informed consent was obtained from all participants or their legal guardians prior to enrollment.

Ethics Approval

This study was approved by the Ethics Committee of Ardabil University of Medical Sciences (Ethics Code: IR.IAU.ARDEBIL.REC.1402.052).

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Conflicts of Interest (COI)

The authors declare that they have no conflicts of interest.

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