Unmasking a Silent Threat: Celiac Disease Revealing Coronary Artery Disease – A Case Report

Case Report

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Abstract—

Celiac disease (CD) is an autoimmune disorder triggered by gluten ingestion in genetically predisposed individuals, marked by inflammation and the production of anti-tissue transglutaminase antibodies. Although CD patients often have lower body mass indexes and LDL levels, systemic inflammation can lead to endothelial dysfunction and accelerated atherosclerosis, potentially increasing the risk of coronary artery disease (CAD). We present a case of a 46-year-old female with CD who developed multivessel CAD, ultimately requiring coronary artery bypass grafting. This case highlights the significant cardiovascular risk associated with CD, suggesting that inflammation and genetic factors may contribute to atherosclerosis. While the precise mechanisms remain unclear, the findings underscore the need for vigilant cardiovascular monitoring in CD patients and further research to explore the impact of gluten-free diets on cardiovascular health.

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Keywords—Coronary Artery Disease; Coronary Arteries; Celiac Disease; Autoimmune; Gluten

Resumen— Desenmascarando una Amenaza Silenciosa: Enfermedad Celíaca Revelando Enfermedad Arterial Coronaria – Reporte de Caso

La enfermedad celíaca (EC) es un trastorno autoinmune desencadenado por la ingestión de gluten en individuos genéticamente predispuestos, caracterizado por inflamación y la producción de anticuerpos anti-transglutaminasa tisular. Aunque los pacientes con EC a menudo tienen índices de masa corporal y niveles de LDL más bajos, la inflamación sistémica puede llevar a disfunción endotelial y aterosclerosis acelerada, lo que podría aumentar el riesgo de enfermedad arterial coronaria (EAC). Presentamos el caso de una mujer de 46 años con EC que desarrolló EAC multivaso, lo que finalmente requirió un injerto de bypass coronario. Este caso resalta el significativo riesgo cardiovascular asociado con la EC, sugiriendo que la inflamación y los factores genéticos pueden contribuir a la aterosclerosis. Aunque los mecanismos precisos siguen siendo inciertos, los hallazgos subrayan la necesidad de una vigilancia cardiovascular atenta en los pacientes con EC y la necesidad de realizar más investigaciones para explorar el impacto de las dietas sin gluten en la salud cardiovascular.

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Palabras clave—Enfermedad coronaria, Arterias coronarias, Enfermedad celiaca, Gluten

Introduction

Celiac Celiac disease (CD) is a chronic autoimmune enteropathy triggered by the consumption of gluten-containing foods in genetically predisposed individuals carrying HLA-DQ2 and/or HLA-DQ8 genes. The immune response in CD includes the production of antibodies such as anti-tissue transglutaminase antibodies, crucial for its diagnosis. Recent studies have explored the relationship between CD and cardiovascular diseases, including coronary artery disease (CAD). Despite typically lower body mass indexes and LDL levels, as well as reduced risk of hypertension, patients with CD may present with increased intimal-medial thickness and endothelial dysfunction due to systemic inflammation and release of inflammatory mediators. These factors can accelerate atherosclerosis, thereby heightening the risk of CAD.

This clinical case report provides a detailed examination of a unique case involving multivessel coronary artery disease and celiac disease, shedding light on the intricate interplay between these seemingly distinct clinical conditions.

Case Report

We present the case of a 46-year-old female with a history of tobacco use, who presented with progressive severe oppressive-like chest pain, tachypnea, and diaphoresis over the course of one month. Initially, she was told her chest pain was secondary to anxiety. Further history-taking revealed an 8 kg involuntary weight loss and a 2-year history of diarrhea that had worsened in the last 3 months. The patient was evaluated by a gastroenterologist and underwent both upper endoscopy and colonoscopy with biopsies, revealing severe villous atrophy suggestive of celiac disease. Follow-up antibodies were positive for anti-transglutaminase IgA, anti-endomysial IgA, and antigliadin, confirming the diagnosis of celiac disease. Due to persistent chest pain, the patient was referred to a cardiologist and found to have an elevated calcium score.

The patient was later admitted to the coronary unit with unstable angina and non ST-elevation myocardial infarction. A subsequent coronary CTA revealed systolic dysfunction, total occlusion of the right coronary artery, circumflex with 70 % stenosis, as well as significant lesions in the proximal and mid LAD with 90 % and 60 % stenosis, respectively (Figura 1 and Figura 2). A follow-up coronary angiogram (Figura 3) confirmed multivessel coronary artery disease. The patient underwent coronary artery bypass grafting (CABG), during which she experienced asystole and required placement of an epicardial pacemaker. Subsequently, she was discharged to cardiac rehabilitation and started on guideline-directed medical therapy for CAD.

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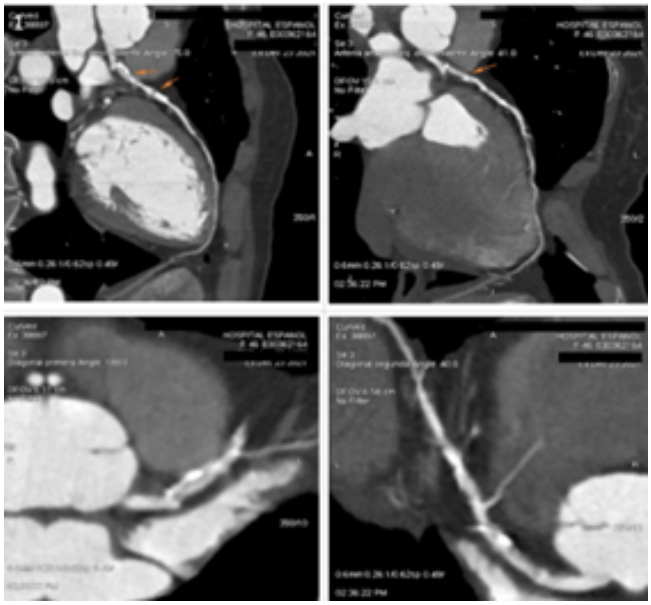

Figure 1: Coronary Computed Tomography Angiography (CTA). LAD with proximal 90 % stenosis, mid-LAD with 60 % stenosis.

Discussion

Celiac disease, an autoimmune disorder triggered by the ingestion of gluten—a protein found in wheat, barley, and rye—is traditionally recognized for its gastrointestinal manifestations but also exhibits systemic implications affecting various organ systems.[3] In contrast, coronary artery disease (CAD) is a vascular pathology characterized by luminal stenosis or occlusion within coronary arteries, typically due to atherosclerotic plaque formation involving cholesterol and other atherogenic agents.

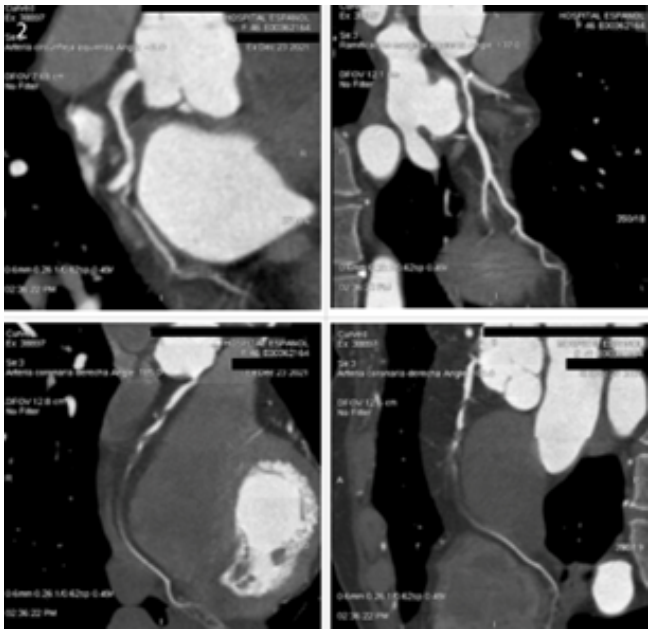

Figure 2: Coronary Computed Tomography Angiography (CTA). Proximal circumflex with 70 % stenosis, RCA with 90 % stenosis, mid-RCA with CTO.

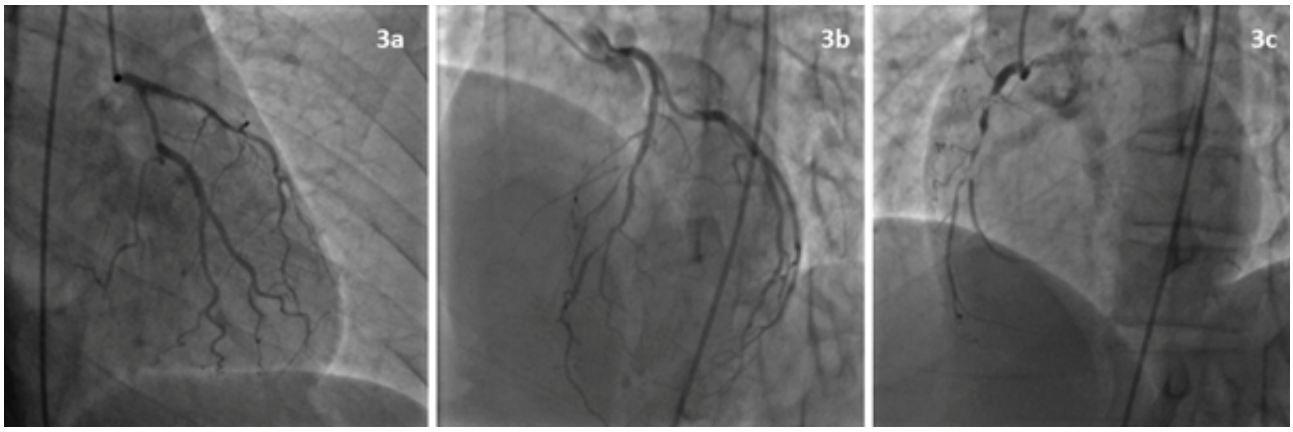

Figure 3: Coronary angiogram (3a. RAO view with 50 % diffuse circumflex lesion LAD with diffuse disease, 3b. AP cranial view with LAD diffuse disease, circumflex artery with proximal obstruction, and left main with 30 % distal lesion. 3c. LAO demonstrating subocclusive obstruction of the RCA.

The association between celiac disease and coronary artery disease (CAD) has gained increasing attention in recent years. Emerging studies have begun to explore the connection between celiac disease and CAD, revealing both corroborative and contrasting findings.[1,2] Celiac disease is marked by prolonged small intestine inflammation in response to gluten exposure, which parallels the inflammatory environment observed in the coronary arterial walls in CAD.[4,5] However, the precise pathophysiologic mechanisms of this connection remain unclear and warrant further investigation.[4]

Inflammation caused by celiac disease can lead to endothelial dysfunction and systemic oxidative stress, both of which are known to promote atherosclerosis and CAD.[6] Additionally, genetic factors that predispose individuals to celiac disease may also affect lipid metabolism and homocysteine levels, which are critical in the development of CAD.[10] The overlap of genetic susceptibility and inflammatory processes between celiac disease and CAD suggests a complex interplay where genetic predispositions to one condition may exacerbate the risk of the other. Thus, understanding these genetic and inflammatory interactions is essential for elucidating the pathways through which celiac disease may contribute to an increased risk of coronary artery disease.

Retrospective case-control studies highlight an increased cardiovascular risk in patients with celiac disease, linking it to elevated risk factors such as hypertension and dyslipidemia that contribute to CAD.[1] Wang et al. also reported a direct association between celiac disease and cardiovascular diseases, stressing the need for awareness of cardiovascular risks in these patients.[2] However, other studies provide a more nuanced view. Gajulapalli and Pattanshetty noted a moderate increase in CAD risk among celiac patients, influenced by malabsorption and nutritional deficiencies.[4] Haider et al. observed an increased prevalence of CAD in a nationwide study, suggesting a complex link between celiac disease and CAD.[5] Ludvigsson et al. and Emilsson et al. identified an increased risk of ischemic heart disease and idiopathic dilated cardiomyopathy, respectively, emphasizing the broader cardiovascular impact of celiac disease.[6,7]

Recent analyses, including those by Conroy et al. using UK Biobank data, suggest a possible link but also highlight the need for further research to clarify this association.[3] Zanini et al. identified hyperhomocysteinemia as a potential factor in cardiovascular risk for celiac patients.[10]

In summary, while there is evidence suggesting an increased cardiovascular risk in celiac disease patients, the relationship is not fully understood.[8] Inflammatory processes, nutritional deficiencies, and shared risk factors likely contribute to this risk.[9] Further research is needed to clarify the mechanisms and develop guidelines for managing cardiovascular health in celiac patients. Clinicians should monitor cardiovascular health closely and consider both gastrointestinal and cardiovascular concerns in these patients.

Our case highlights the strong association of CAD with CD. We suspect the underlying pathogenesis involves an autoimmune inflammatory process leading to accelerated atherogenesis. Early detection and aggressive treatment of CD may lead to favorable outcomes regarding cardiovascular complications associated with this chronic disorder. It remains unclear whether adherence to a gluten-free diet can reduce or increase the risk of CVD among individuals with CD.

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Conflict of Interest

The authors declare to respect the ethical principles of research and to be free of any conflict of interest.

Referencias

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