



## GIARDIASIS IN DUODENUM: A CASE REPORT

## Pathology

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## ABSTRACT

Giardia duodenalis, also known as Giardia lamblia and Giardia intestinalis, is an opportunist protozoan parasite that predominantly parasitizes the duodenum of humans, as well as of numerous domestic and wild animals, causing giardiasis. The disease is distinguished by a broad spectrum of clinical manifestations ranging from asymptomatic infection to vomiting, abdominal pain, weight loss, severe diarrhea, and malabsorption syndrome. Giardiasis is one of the most common pathogenic parasite infections in humans, with approximately 280 million cases of symptomatic giardiasis being reported annually worldwide. Giardiasis has been included in the World Health Organization's neglected disease initiative since 2004 owing to its severe impact on children, which includes severe malnutrition, physical retardation, and poor cognitive function. Laboratory results and endoscopy can provide important diagnostic evidence for giardiasis; however, the cornerstone of the diagnosis remains the histological examination of gastric and duodenal specimens.

## KEYWORDS

Giardia duodenalis, biopsy, diarrhea.

## 1. INTRODUCTION

**Giardiasis** is an intestinal infection caused by the parasite Giardia that can cause prolonged diarrhea. Giardiasis occurs after ingesting Giardia parasite cysts (hard shells containing the parasite). Giardia is passed in the feces, from which it can infect other people or animals. It can survive outside the intestinal tract for weeks or months. Giardiasis occurs around the world and is one of the most common intestinal parasites in North America. The most common symptoms of giardiasis are diarrhea, greasy stool, stomach cramps, nausea, and dehydration. Some people infected by Giardia do not experience any symptoms<sup>(1)</sup>. Giardia found throughout the world but less common in developed countries<sup>(2)</sup>.

Infection is more common in areas with poor sanitation and limited water treatment facilities. Giardial infection is more common in children than in adults and equal in both sexes. Most commonly found in the small intestine, classically duodenum whereas jejunum, ileum and stomach are other possible sites<sup>(3)</sup>.

Giardia lamblia virus (GLV), first identified in 1986, is a double-stranded RNA virus in the family Totiviridae that specifically infects trophozoites of *G. duodenalis*. GLV is the only one of the known protozoal dsRNA viruses that can transmit efficiently by extracellular means, although the pathway involved is not well outlined. Innate immunity and adaptive immunity, two main components of the immune system, are crucial for the eradication of Giardia infection.

Innate immunity acts as the first line of defense against infections by pathogenic microorganisms. Several studies have demonstrated that innate immunity-associated Toll-like receptors (TLRs) are critical for the elimination of *G. duodenalis*; however, whether TLR9 has a role in innate immune responses against Giardia infection remains unknown<sup>(4)</sup>.

## 2. Case Report

A 32-year-old woman, presented to the gastroenterology OPD with abdominal pain, nausea and recurrent diarrhea. Abdominal pain was generalized without radiation. No alleviating or aggravating factors were noted. She had frequent, watery to loose, non-bloody bowel movements. Patient had no fever, chills, skin rashes or joint pains. She denied any recent travel, sick contact or antibiotics use prior to onset of symptoms. Patient did not use tobacco, alcohol or illicit drugs. No family history of similar symptoms. Patient was admitted to the hospital for further management.

On physical examination, pallor present. There was no palpable organomegaly. Physical examination of heart, chest and extremities were normal. Laboratory workup revealed low haemoglobin ; total

white blood cells were 7800 cells/ $\mu$ L. Kidney function, electrolytes and liver function tests were within normal limits. Microscopic testing for stool ova and parasites was negative. All patient's medications were reviewed, and the possibility of drug-induced diarrhea was excluded. Patient underwent duodenoscopy, mucosal biopsies were obtained from the duodenum showed erythema of the duodenal mucosa. Histological examination revealed Increased intraepithelial lymphocytes , Increased inflammatory cells and prominent lymphoid aggregates in the lamina propria. Organisms are pear shaped or have a falling leaves appearance and are about the size of an epithelial cell nucleus (often misinterpreted as sloughed epithelial cells or luminal contents), with 2 nuclei, mostly pale eosinophilic to translucent in crescent shaped trophozoites. Diagnosis of giardiasis intestinalis was made.

## DISCUSSION

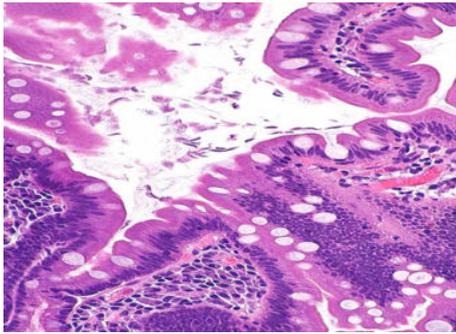
This is a case of a 32-year-old woman who suffered from multiple gastrointestinal symptoms including nausea, abdominal pain and diarrhea, which are commonly encountered in the healthcare setting. She presented to the hospital few times and was hospitalized without identifying the underlying diagnosis, and had no relief of her symptoms. Upper endoscopy with biopsies confirmed the diagnosis of Giardiasis , based on histopathologic findings of giardia organism in the duodenal mucosa. The cornerstone of the diagnosis remains the histological examination of duodenal specimens for evidence of Giardiasis.

Causative agent is flagellate protozoan Giardia intestinalis (also known as *G. lamblia* or *G. duodenalis*). Giardia exists in 2 forms: trophozoites and cysts. Trophozoites: motile, 4 pairs of flagellates, pear shaped organism. Infection is transmitted through feco-oral route, frequently through ingestion of contaminated water and food or person to person transmission through contaminated surfaces or objects<sup>(5)</sup>. Giardia intestinalis infection causes enterocyte damage and loss of brush border of the epithelial cells of the small intestine, which leads to shortening of microvilli and altered epithelial barrier function.<sup>(6)</sup>.

Organisms are pear shaped or have a falling leaves appearance and are about the size of an epithelial cell nucleus (often misinterpreted as sloughed epithelial cells or luminal contents), with 2 nuclei, mostly pale eosinophilic to translucent in crescent shaped trophozoites. Mucosal alterations cause watery diarrhea, malabsorptive steatorrhea, nausea, abdominal pain, vomiting and weight loss. Main consequence of Giardia colonization is nutrient malabsorption.

If the diagnosis of giardiasis is made, the pathologist should routinely check the lamina propria for plasma cells since chronic giardiasis can

be seen with CVID and a paucity of plasma cells could be a clue to this second diagnosis.



Figure

#### REFERENCES

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