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Letter to the Editor

# When to think of Sarcina sp. in histopathologic examination of gastrointestinal tract: insights from a one-year-old with esophagitis and gastric outlet obstruction

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Dear Editor-in-Chief,

*Sarcina ventriculi* is a Gram-positive, anaerobic coccus that is rarely encountered by pathologists in biopsy specimens. Despite its infrequency, its distinct histopathological characteristics facilitate the diagnosis when thoroughly investigated. In this report, we present a case of a 1-year-old patient who had a history of vomiting and diagnosed with gastric outlet obstruction via endoscopy. We emphasize the important histopathological and clinical features that should prompt pathologists to consider this organism in their differential diagnoses.

A 1-year-old girl was admitted to the emergency department due to a 10-day history of projectile vomiting, which had worsened in recent days. Upon admission, physical examination and laboratory results – including complete blood count, renal function tests, serum electrolytes, bilirubin, and amylase – were within normal limits. Mild elevations were noted in SGOT and SGPT (58 U/L and 63 U/L, respectively).

Ultrasound imaging revealed gastric expansion and delayed gastric emptying. An esophagogastroduodenoscopy (EGD) demonstrated furrowing and inflamed mucosa in the esophagus, with additional findings of inflamed gastric mucosa and gastric outlet obstruction that prevented the scope from advancing to the duodenum.

Histopathological examination of H&E-stained slides revealed acute esophagitis featuring cuboid pockets of organisms arranged in clusters of 4, 8, and more, consistent with Sarcina sp. bacteria. These organisms were also observed on the mucosal surface of the antral gastric mucosa. Notably, *Helicobacter pylori* was not identified in the gastric specimen (Fig. 1)

*Sarcina ventriculi*, also known as *Clostridium ventriculi*, is a rare, Gram-positive coccus that is non-motile and anaerobic. It is a carbohydrate-fermenting bacterium that is capable of surviving and proliferating in acidic environments. Although rarely found in human biopsies, *Sarcina ventriculi* exhibits distinct morphological characteristics, forming tetrads or octets, making it easily identifiable in H&E and Giemsa-stained light microscopy. The name “Sarcina”, introduced by Goodsir, comes from the

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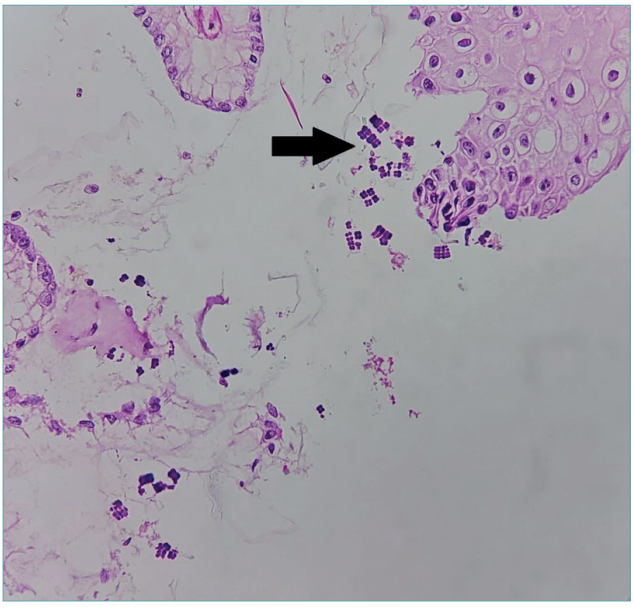

**Figure 1.** Spherical organisms with tetrad arrangement (black arrow) observed on the surface of the mucosa of gastroesophageal junction. (Hematoxylin and eosin stain, x400 magnification).

Latin word meaning "package," reflecting its unique cellular arrangement. Although *Sarcina ventriculi* was first identified in the 1840s, it wasn't successfully isolated through culture until 1911. The pathogenic role of *Sarcina ventriculi* in humans remains uncertain and highly debated. A systematic review conducted by Tartaglia et al. in 2022 examined 55 articles that documented a total of 66 cases of *Sarcina ventriculi*, sourced from databases such as PubMed, Google Scholar, and Cochrane. The review found that *Sarcina ventriculi* was predominantly isolated from the gastrointestinal tract, with less frequent isolation from the respiratory, urinary, and bloodstream systems respectively. Within the gastrointestinal tract, the most common sites of infection were the stomach, followed by the esophagus and duodenum. Initial symptoms often included abdominal pain, vomiting, nausea, diarrhea, abdominal distention, hematemesis, dyspepsia, and dysphagia [1,2]. Reports indicate that *Sarcina ventriculi* is linked to delayed gastric emptying and obstruction, particularly in conjunction with underlying conditions like diabetic gastroparesis. Although rare, gastric perforation and emphysematous gastritis have been documented as complications associated with *Sarcina ventriculi*. *Sarcina ventriculi* may be incidentally detected during histological examinations of gastric specimens [3-5]. Endoscopic evaluation of patients with gastrointestinal involvement may reveal findings such as retention of food, ulceration, inflammation of mucosa, necrosis, or strictures [1]. Histopathological examination of patients undergoing endoscopic biopsy may reveal Sarcina adhering to the surface of intact lining epithelium, or it may show accompanying erosions, ulcers, and necrosis [2]. *Sarcina ventriculi* is primarily identified in adults, with only a limited number of reported cases involving children [2,6].


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### Conflicts of interest statement

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### Authors' contributions

All authors have approved the publication of the final version of the manuscript.

### Ethical consideration

The content of this manuscript complies with the journal's ethical standards.

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