Esophageal Cytology: A Tale of Shish Kebab and Roman Legionaries

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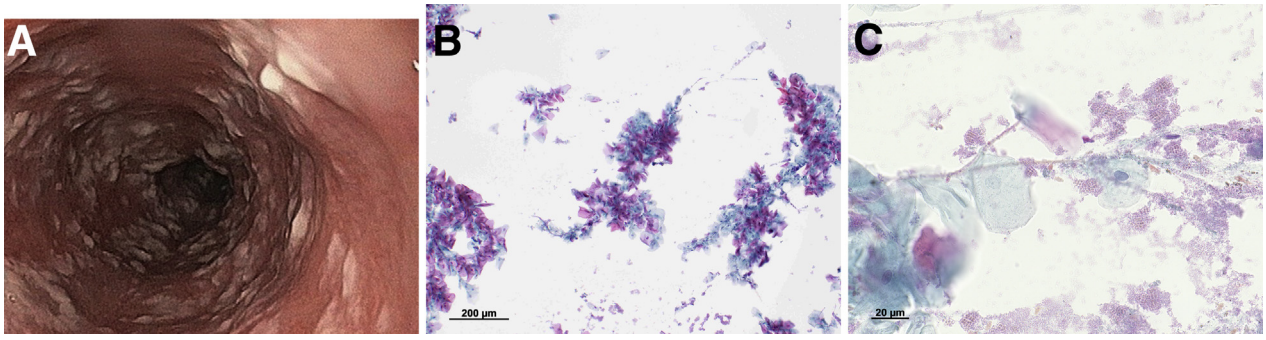

Question: An 86-year-old man was referred to the Department of Gastroenterology at the Inselspital Bern for a 1-month history of reduced general condition, weakness, and relapsing fever. During admission, he also experienced epigastric pain with tenderness on palpation. No other symptoms were noted, including weight loss, gastrointestinal bleeding, or allergies. His medical history included rheumatic disease (with long-term steroid use), mild reflux esophagitis, and a hiatal hernia, colonic pandiverticulosis, valvular and hypertensive cardiopathy, and chronic renal insufficiency. Laboratory findings indicated elevated inflammatory markers and transaminases, thrombocytopenia, and anemia. Blood and urine cultures were sterile.

After treatment with antibiotics, his fever, inflammatory markers, thrombocytopenia, and anemia all improved. Endoscopic evaluation of the upper gastrointestinal tract revealed white mucosal plaque-like lesions in the esophagus (Figure *A*), a small hernia in the gastric cardia, and a normal esophageal z line. Cytology smears were taken from the esophageal lesions, with biopsies taken from the gastric antrum and corpus, and samples were submitted for microscopic evaluation. Esophageal squamous epithelium showed reactive changes including eosinophilic cytoplasm, perinuclear halos, and a so-called shish kebab–like arrangement (Figure *B*, *C*). Gastric biopsies showed changes indicative of a reactive gastropathy without evidence of *Helicobacter pylori* infection.

What is the diagnosis?

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Conflicts of interest
The authors disclose no conflicts.

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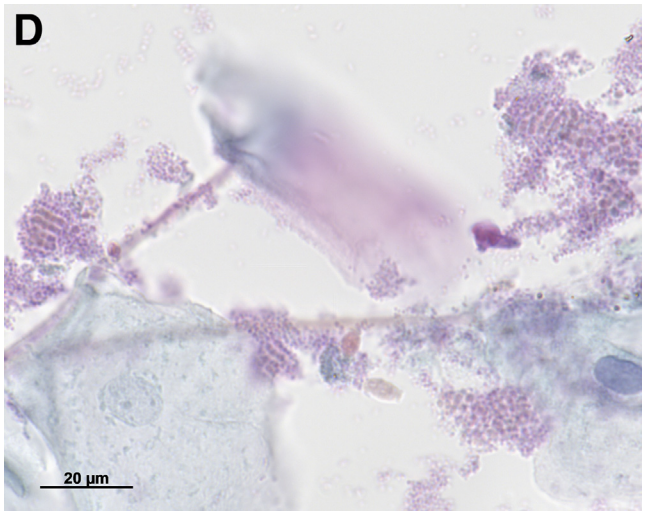
Answer to: Image 7: Esophagitis Owing to Fungal *Candida* Species



Clinical history and presentation, and endoscopic findings are suggestive of an esophagitis owing to fungal *Candida* species. Accordingly, esophageal cytology showed alterations consistent with *Candida* infection. Numerous pseudohyphae and *Candida* organisms were detected near the squamous epithelium, with detritus, commensal esophageal flora, and neutrophilic granulocytes in the background (Figure *B*). Within this background, *Sarcina ventriculi* bacteria with its distinct morphology of cuboid, basophilic tetrads or octets were observed, each single bacterium measuring approximately 2.5 μm in diameter (Figure *B–D*). *S ventriculi* was not detected in simultaneously evaluated histologic biopsies of the stomach. The patient was treated with fluconazole.

S ventriculi is a gram-positive, anaerobic coccoid bacterium with unique carbohydrate fermentation abilities, and the potential to colonize acidic environments. The name Sarcina reflects their morphology, and refers to the Latin word for "marching pack" of Roman soldiers. Because of its thick cell wall and lattice-like arrangement, *Sarcina* can easily be mistaken for vegetable matter by pathologists not familiar with its morphology. *Sarcina* can colonize the luminal debris of the esophagus or stomach without inducing mucosal lesions or inflammation at the surface epithelium,[1–3] and unlike the adverse outcomes of *Sarcina*–associated veterinary disease, the pathogenicity of *Sarcina* in humans is debated.[1] Clinical presentations in *Sarcina*–colonized patients range from asymptomatic, to abdominal and epigastric pain, nausea, or dysphagia.[1,2] *Sarcina* is associated with delayed gastric emptying and bacterial overgrowth,[1] and has been suggested to exacerbate preexisting gastrointestinal mucosal injuries, resulting in life-threatening complications such as emphysematous gastritis or esophagitis, or gastric perforation.[1,2] Colonization of the esophagus with *S ventriculi* has recently been described to cause an endoscopic presentation reminiscent of esophageal candidiasis, and esophageal candidiasis was discussed as a differential diagnosis.[3]

To our knowledge, *Sarcina* has not previously been described in cytologic specimens. Here, we report a case of esophageal candidiasis with detectable *S ventriculi* in esophageal cytology smears, implying that *S ventriculi* and *Candida* species can coexist. Identification of *Sarcina* organisms in the upper gastrointestinal tract may contribute to the prevention or early diagnosis of complications in at-risk patients. Furthermore, the incidental finding of *S ventriculi* in esophageal candidiasis may have important pathologic implications.

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