



Gastric Diverticulum in Computed Tomography

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Abstract

Gastric diverticula are the outpouchings of the stomach wall. They are the least common diverticula of the gastrointestinal system. They are usually asymptomatic and are diagnosed accidentally by upper gastrointestinal contrast radiographic studies or upper gastrointestinal endoscopy. Identification is important as they can cause serious complications such as upper gastrointestinal bleeding or perforation. We herein present a case of asymptomatic congenital gastric diverticulum.

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Introduction

Gastric diverticula (GD) are very rare anomalies seen in upper gastrointestinal system (GIS) contrast radiographic studies (0.04%), in upper GIS endoscopy examinations (0.01-0.11%) and in autopsy series (0.02%).¹⁻³ They are similar structures with small intestine and colon diverticula and seen equally in men and women between the ages of 50-70.⁴ Although they are generally asymptomatic, sometimes cause symptoms such as epigastric pain, discomfort, nausea, vomiting, halitosis, bloating, early satiety, anorexia and dysphagia.³ GD greater than 4 cm

in diameter are more susceptible to complications and are less likely to respond favorably to medical management.³

Since the symptoms are uncertain and have no distinctive findings from other GIS diseases, the most important step to diagnose the disease is to keep this pathology in mind and in the list of possible diagnoses. Follow-up or palliative treatment options such as proton pump inhibitors and antacid treatments are preferred in asymptomatic patients, surgical treatment is required if serious complications such as ulceration, malignant transformation or perforation occur in the gastric diverticulum.



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Case Report

Our patient is a 30-year-old woman. When she applied to the Internal Diseases outpatient clinic with a complaint of dyspnea, thorax computerized tomography (CT) study was performed. CT scan showed an incidental stomach diverticulum with 3x2 cm size in the gastric fundus posterior wall (*Figure 1a and 1b*). Although it was very close to the left adrenal gland, the continuity of diverticulum with the stomach lumen, air density (*Figure 2*) in it and the fat line between the lateral adrenal crus could be seen (*Figure 3*). After CT study, upper GIS endoscopy was performed and wide-mouthed diverticulum was observed in the fundus (*Figure 4*).

Since our patient was asymptomatic and pathologies such as ectopic mucosa, ulcer or malignancy were not found in the gastric diverticulum, clinical monitoring without treatment advised. Informed consent was taken before all procedures.

Discussion

GD can be classified as congenital or true diverticulum and acquired or false diverticulum. True or congenital diverticula are mostly located on the posterior wall of the gastric fundus, contain all the layers of the gastric wall and are thought to be associated with the defect in the fusion of the dorsal and ventral mesentery in the embryonic period.⁵ Seventy-five percent of them are located in fundus, 2 cm below the gastroesophageal junction on the posterior wall, 3 cm from the small curvature, and

their diameter ranges from 3 cm to 11 cm.^{2,6,7}

The false diverticula do not contain layers of muscularis or serosa and tend to form more often in the antrum. It is possible to classify as pulsation and traction diverticulum according to the formation mechanisms. Conditions such as obesity or chronic cough cause chronic increase in intragastric pressure, trigger pulsion diverticulum; where conditions associated with inflammatory processes such as surrounding peptic ulcer, malignant disease, pancreatitis, gastric outlet obstruction and patients who undergo to a bypass with Roux-Y gastric can develop traction gastric diverticulum.^{5,6,8}

Gastric diverticulum patients are generally asymptomatic or have ambiguous symptoms seen in other diseases of GIS, such as peptic ulcer or gastritis, so it is necessary to doubt this pathology for differential diagnosis. GD may not be visualized in upper GIS contrast radiographic studies and during endoscopy, especially when they are narrow-necked. In a large review, Palmer⁹ reported that 5% of GD are missed during upper gastrointestinal investigation.

The upper GIS endoscopy has the highest diagnostic value since it can directly see the high morbidity conditions such as ectopic mucosa, ulceration and malignancy in the diverticulum, and has the possibility of simultaneous biopsy.^{10,11} The upper GIS radiographs with barium, which have been used more frequently in the radiology routine in the past, can show gastric diverticulum with high accuracy when obtained with appropriate position and technique. It has been shown that during contrast radiographic series,



Figure 1a: CT-scan-axial sections, GD continuous with stomach lumen



Figure 1b: CT-scan-axial sections, GD containing air

the GD is best recognized with the use of a right, anterior oblique angle while the individual is in a trendelenburg and slightly left lateral decubitus position.^{12,13}

Since CT scans are not able to show real time gastrointestinal tract movement, the peristaltic activity occurring in the stomach wall at the time of the examination causes false images and therefore diagnostic errors in daily practice. Sometimes radiologists misunderstand this normal gastric wall appearance. In order to diagnose gastric diverticulum with CT, it is necessary to observe the continuity with gastric lumen and/or to observe the air density, if possible, to fill the diverticular lumen with given oral contrast agent. As most GD take part along the posterior wall of the stomach, it has been suggested that CT scans obtained in the prone position may facilitate air movement to the top and form an air-fluid level.¹⁴

However, CT scans are reported to mistake diverticula for adrenal masses¹⁵, we think, this usually depends on the experience of the radiologist. The fat line between the lateral adrenal crus can be seen with attention and also coronal or sagittal images are very helpful to distinguish between GD and left adrenal mass. The CT study is non-invasive and has much less radiation dose with advanced multislice 3D reformat technology. Major advantages of CT are the ability to show perigastric space, accompanying epigastric inflammation, abscess and perforation. Life threatening complications accompanying the diverticulum can be investigated and definitely reported with CT examination.

However, the methods used to detect GD occasionally fail, combined radiological and endoscopic diagnostic approach should be used.¹⁶

Conclusion

GD are one of the rarest anomalies of the GIS and are generally asymptomatic or cause vague symptoms, such as pain, discomfort, and dyspepsia. Although not very often, their diagnosis and follow-up are important because of potential risk for life threatening complications. First of all, suspicion of this pathology is required for the diagnosis, followed by combined use of radiological and endoscopic studies.



Figure 2: CT-scan-sagittal section observing diverticulum on the posterior wall of the stomach containing air (Arrow)

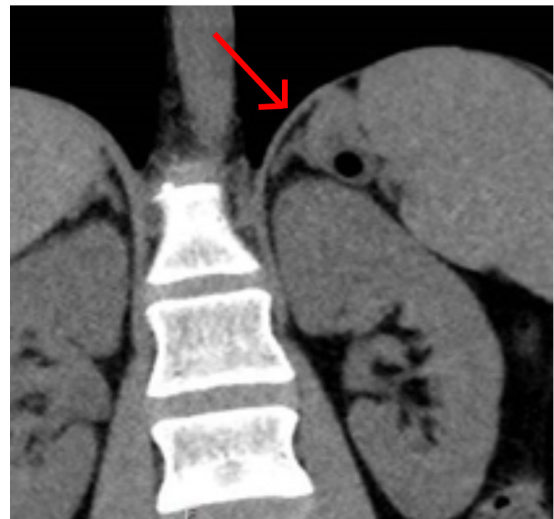


Figure 3: CT-scan-coronal section where saccular image is observed with air density inside. Thin fat line (Arrow) can be seen between the GD and left adrenal gland.



Figure 4: Endoscopic view of the gastric diverticulum located in the fundus of the stomach

Conflict of Interests

The authors declared that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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