

case report

Gastroparesis in a young diabetic patient

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Background. Gastroparesis is defined as a delay in emptying of contents from the stomach and occurs in a variety of conditions, e.g. after vagotomy or in systemic diseases such as diabetes mellitus, scleroderma and amyloidosis. The purpose of this paper is to present the radiologic examination, a simple, reliable and noninvasive method as an alternative to other methods for the assessment of gastric emptying.

Case report. A twenty-one years old female was admitted because of suspected autonomic neuropathy. She had insulin dependent diabetes mellitus type I for the last ten years. At the time of admission she was complaining of nausea, vomiting, weakness and occasional dizziness. A barium study of oesophagus and stomach was performed: oesophagus was dilated and aperistaltic, remnants of food were seen in aperistaltic stomach but no obstruction, causing delayed emptying, was found.

Conclusions. Scintigraphy is at the present the standard technique for the assessment of gastric emptying. Ultrasonography, magnetic resonance imaging, electrogastrography, gastroduodenal manometry and emptying of radiopaque pellets are also used for the evaluation of gastric motility in cases of delayed gastric emptying. The role of barium studies remains to be established.

Key words: diabetes mellitus; gastroparesis – radiography; contrast media; barium

Introduction

Gastrointestinal motor dysfunction can be the result of many different disorders.¹ In the majority of cases it occurs secondarily to systemic diseases or after abdominal operative procedures,² but it is rare as a primary disorder of the autonomic nervous system. Gastroparesis is defined as a delay in emptying of contents from the stomach and occurs after vagotomy,³ with pancreatic adenocarcinoma, or in diabetes, scleroderma and amyloidosis.⁴

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Diabetes mellitus affects every organ system including the gastrointestinal tract. Almost all diabetic gastrointestinal manifestations are directly or indirectly related to autonomic neuropathy. The basic gastrointestinal abnormality in diabetic autonomic neuropathy is disordered motility.⁵

Abnormal oesophageal motor function is characterised by the absence or decreased amplitude of primary peristaltic wave and by the delay in oesophageal emptying. Lower oesophageal sphincter pressure is decreased and there is a higher incidence of gastroesophageal reflux. Most diabetic patients with disturbed oesophageal motility do not have specific oesophageal symptoms.

Diabetic gastroparesis, associated with delayed gastric emptying of liquids, as well as digestible and indigestible solids, occurs in approximately 25% of diabetic patients, the majority of them having insulin-dependent diabetes mellitus.⁶⁻⁸ Many patients with abnormal gastric emptying do not have specific symptoms. The most disturbing are nausea and vomiting, frequently anorexia, early satiety, bloating and discomfort. Gastroparesis contributes to poor diabetic control because of unpredictable oral intake and because of poor absorption as a result of delayed gastric emptying.

The radiologic criteria for gastroparesis are significant solid gastric residue and diminished or ineffectual peristalsis with barium retention at 30 min. without evidence of mechanical gastric outlet obstruction.

Case report

A twenty-one years old female was admitted because of suspected autonomic neuropathy. She was complaining of occasional vomiting, diarrhoea, general weakness and loss of appetite. She had insulin dependent diabetes mellitus type I for the last ten years, with poorly regulated blood glucose level. Two years



Figure 1. Dilated, aperistaltic oesophagus.



Figure 2. Dilated, aperistaltic stomach, with solid residue, barium contrast in duodenum.

previously the findings on endoscopy, performed because of vomiting and epigastric pain, were normal. The patient was referred to ra-

diology for barium examination of the upper gastrointestinal tract because of suspected gastroparesis.

At the examination in the upright position the barium contrast passed freely through the oesophagus, which appeared normal, into the stomach. In prone position the oesophagus was dilated, aperistaltic (Figure 1), the lower oesophageal sphincter was wide open but the contrast did not pass into the stomach. The stomach was dilated, remnants of food were visible, no peristalsis was observed and the contrast passed through the pyloric channel with the patient in the right lateral decubitus position (Figure 2). No obstruction was noted. Normal peristalsis of small bowel was observed. The radiologic diagnosis was gastroparesis with diminished oesophageal motility.

Diagnosis of autonomic neuropathy was confirmed with autonomic nerve tests.

Discussion

Oesophageal motor function can be evaluated by scintigraphy, manometry, 24-hour pH metry, endoscopy and barium swallow,^{1,8,9} of which manometry is the most sensitive. Endoscopy and barium swallow are supposed to be structural tests for revealing other causes of slow oesophageal emptying,⁷ but radiologic examination of the oesophagus can assess disturbed oesophageal motility, closure of lower oesophageal sphincter and, performed as a double contrast study, can show the changes of the mucosa of the oesophagus.

Gastric emptying function can be evaluated by numerous techniques. On plain abdominal film a dilated stomach with solid residue can be seen in patients with suspected gastroparesis.⁵ Barium studies supposedly lack sensitivity, their disadvantage being radiation exposure.⁷ Scintigraphy is often considered as the gold standard test, but it is expensive and in clinical practice of limited

availability, usually restricted to highly specialised medical centres. In a retrospective analysis of gastric emptying of radiopaque pellets the authors concluded that this method is probably a more sensitive test of gastric motor dysfunction than scintigraphy.¹⁰ Ultrasonography requires an expert for interpretation of the study and technically adequate studies are not possible in every subject.¹¹ Antroduodenal manometry is invasive, not well tolerated in many patients and, as electrogastrography, limited to tertiary centers.⁷ Endoscopy is a quite specific structural test, but it is invasive and in the absence of retained food at the time of examination can not rule out gastroparesis.¹¹ Magnetic resonance imaging is described as an accurate method for evaluation of liquid gastric emptying. It is non-invasive and radiation-free, but it is expensive and not widely available.

In the case of our patient the radiologic examination of the upper gastrointestinal tract with barium revealed absence of oesophageal peristalsis, wide open lower oesophageal sphincter, dilated stomach with remnants of solid food, absence of antral peristalsis and free flow of liquid barium suspension into duodenum, but only in the right lateral decubitus position. Additionally, normal small bowel peristalsis was noted.

In comparison with other tests the radiologic examination is inexpensive, non-invasive and readily available, its potential disadvantages being radiation exposure and, supposedly, low sensitivity.⁷ In available literature we could find no record of radiation damage due to the barium studies of the upper gastrointestinal tract. With modern and properly adjusted equipment the radiologic studies can be made virtually "safe",¹² mean doses can be reduced¹³ and well within acceptable levels.¹⁴ The examination can be performed as a single contrast study, for the assessment of motility, or/and as a double contrast study, for the assessment of mucosal changes.

Conclusions

The abundance of tests for diagnosis of gastroparesis suggests that each of them has one or even more disadvantages. In our experience the radiologic examination of the upper gastrointestinal tract with barium suspension is more promising in comparison with other tests, being the examination for functional as well as structural abnormalities.

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