

Five Risk Factors Identify Patients With Gastroesophageal Intussusception

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Hypothesis: Risk factors in patients with gastroesophageal intussusception who have noncardiac chest pain need to be identified and analyzed.

Design: Prospective consecutive series of 43 patients with gastroesophageal intussusception.

Setting: Outpatient gastrointestinal endoscopy suite for 42 patients; 1 patient sustained gastroesophageal intussusception during labor and delivery and underwent an emergency laparotomy.

Intervention: Upper gastrointestinal tract endoscopy under intravenous sedation with appropriate monitoring of vital signs and photographic documentation in most patients.

Results: Gastroesophageal intussusception was documented endoscopically in 42 of 43 patients and was found to occur equally in men and women. Five risk factors have

been identified: eating disorders or alcohol abuse, sudden sustained exertion, small-bowel obstruction, acid bile peptic disease, and pregnancy. Fifteen (70%) of 22 men were younger than 35 years; precipitating factors included sustained athletic effort and binge eating and drinking episodes. Fifteen (70%) of the 21 women were older than 35 years and had binge eating, peptic disease, and complications of pregnancy as risk factors.

Conclusions: Five risk factors identify patients with severe vomiting or retching who are most likely to develop gastroesophageal intussusception, the precursor of a Mallory-Weiss tear. Upper gastrointestinal tract endoscopy with photographic documentation is the most accurate method of diagnosis. For most patients, medical management can reverse the cause of the vomiting. If vomiting is caused by mechanical obstruction or massive hemorrhage, surgical intervention may be necessary.

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IN PATIENTS with crushing substernal pain radiating to the neck and left arm who do not have coronary insufficiency, a common cause is gastroesophageal intussusception. The pain caused by gastroesophageal intussusception is preceded by violent vomiting or retching or sudden extreme physical effort and mimics acute myocardial ischemia.¹⁻⁶

In 1724, Boerhaave⁷ described the plight of the grand admiral of the Dutch fleet, who, having had too much to eat and drink, took an emetic powder to relieve the pressure. Following the vomiting episode he felt he had torn something and was about to die, and indeed he did. At the postmortem examination, they found he had perforated his distal esophagus and the food and drink were in the left side of his chest.

In 1929, Mallory and Weiss⁸ described the postmortem findings of linear tears of the gastric mucosa just below

the esophagogastric junction in 4 patients who had been chronic alcoholics. Each patient had a long history of recurrent vomiting and hematemesis following their drinking binges. To confirm their suspicions that the linear tears were due to forceful vomiting, Mallory and Weiss removed the esophagus and stomach from a fresh cadaver, tied off the pylorus, and filled the stomach half full with fluid and air. With finger pressure on the distal esophagus, they applied a sudden strong compression of the stomach and were able to reproduce the tears in the fundus just below the esophagogastric junction.

Following these 3 autopsy reports, Wells,⁹ in 1947, described a patient with gastroesophageal intussusception that was incarcerated for 16 days. At esophagoscopy a "fungating tumor" was observed but biopsy specimens showed only gastric mucosa. After the intussusception spontaneously reduced, the patient remained well. In 1955, Palmer¹⁰ described 3 patients with

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PATIENTS AND METHODS

Of the 43 patients, 42 had the diagnosis established by upper gastrointestinal tract flexible fiberoptic endoscopy by the same observer during a 12-year period. Biopsies were performed for histologic examination to confirm inflammation, ulcer, Barrett's metaplasia, or tumor. Endoscopic photographs were taken in most patients and for the last 4 years were routinely performed with videoendoscopy (**Figure 2**). One 28-year-old pregnant patient had massive upper gastrointestinal tract hemorrhage at the final moments of delivery and emergency laparotomy was performed to identify the source and ligate the Mallory-Weiss tear.

The 22 men had an age range of 20 to 58 years; ages for the 21 women ranged from 26 to 65 years.

Five types of risk factors were identified and for some patients there was significant overlap. Each risk factor was obtained through a detailed history (**Figure 3**). (1) Eating

disorders included bulimia (1 patient) and for the rest included excessive eating, binge eating, large meals, and alcohol abuse. (2) Obstruction was due to congenital lesions obstructing the duodenum, eg, superior mesenteric artery syndrome and malrotation of the intestine with Ladd's peritoneal bands extending across the third portion of the duodenum. (3) Physical exertion involved competitive sports, weight lifting, bike racing, football, basketball, soccer, and heavy lifting at work or at home. (4) Peptic disease included patients with ulcers of the duodenum, stomach, and esophagus, enterogastric reflux gastritis, and esophagitis. (5) In pregnancy, the main problem was hyperemesis gravidarum, in which vomiting and retching occurred 3 to 6 times per day throughout the entire 9 months and was possibly repeated in 2, 3, or 4 subsequent pregnancies. In some patients, the vomiting and retching were especially severe during labor and delivery. One patient presented with massive upper gastrointestinal tract hemorrhage due to a Mallory-Weiss tear following the final thrust at the moment of delivery.

gastroesophageal intussusception that was reproduced each time the patients performed a Valsalva maneuver; he was able to reduce the intussusception by pressure with the esophagoscope.

With the advent of the flexible fiberoptic gastroscope, several series were reported and both Miller et al¹¹ in 1974 and Sugawa and Benishek¹² in 1983 noted a 10% incidence of gastroesophageal intussusception in patients with upper gastrointestinal tract bleeding. Miller et al recorded an intraesophageal pressure of 240 mm Hg during retching and it was their opinion that the Mallory-Weiss tear was the result of the sudden increase in pressure in the esophagus during retching. Besson and Savary¹³ in 1983 described postemetic cardiogastropathy and confirmed that gastroesophageal prolapse, Mallory-Weiss syndrome, and spontaneous perforation of the esophagus (Boerhaave syndrome) are progressive stages of the same dysfunction.

The most complete review of the literature and discussion of the pathophysiology of "postemetic cardiogastropathy" is by Kerr.¹ By applying an inflatable binder across the upper abdomen he was able to induce gastroesophageal prolapse in 4 of 38 patients. These patients complained of crushing substernal pain with radiation to the left arm, a pattern typical for myocardial ischemia but originating within the dilated distal esophagus. Four of these patients achieved complete relief for a 2-year period following a Nissen fundoplication. It is interesting to note that gastroesophageal prolapse and intussusception are dependent not only on reverse gastric peristalsis but also sudden sustained contraction of the muscles of the abdominal wall to increase intra-abdominal pressure sufficiently to drive the gastric wall into the esophagus (**Figure 1**). Animals that lack abdominal wall muscles (such as rabbits, rodents, horses, and cows) are not able to retch and vomit and therefore are not subject to gastroesophageal intussusception.

This report describes the clinical and endoscopic findings in 43 consecutive patients with gastroesophageal intussusception during a 12-year period.

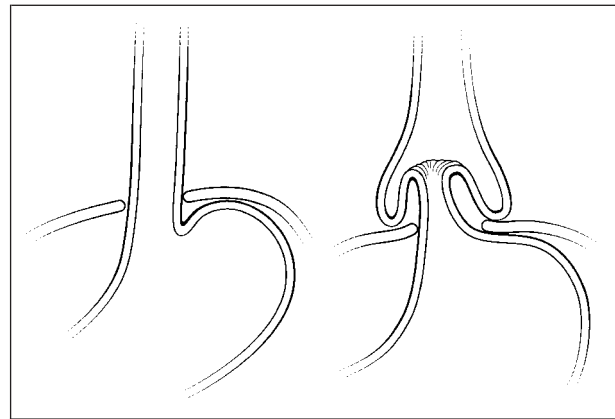


Figure 1. Gastroesophageal intussusception.

RESULTS

Although gastroesophageal intussusception was documented equally in men and women, there were significant differences. Thirteen (70%) of the 22 men were in the 20- to 42-year-old group and the 2 leading risk factors were physical exertion and eating disorders and alcohol abuse; however, obesity was not a problem for this group.

Eighteen (66%) of the 21 women were aged 37 to 65 years and the leading risk factor was eating disorders complicated by moderate to severe intractable obesity.

Eating disorders occurred in 8 of the 21 women in the series and included 1 patient with bulimia that had been in remission for 5 years and 7 patients with excessive eating with marked obesity. Eight of the 22 men in the series had eating disorders more related to binge eating and late meals with alcohol. Men were in a younger age group and often changed their habits as they gained insight and maturity. Alcohol was not a problem among women and obesity was not a problem among men.

Obstruction was the dominant risk factor in 2 women with congenital lesions obstructing the duodenum, ie, su-

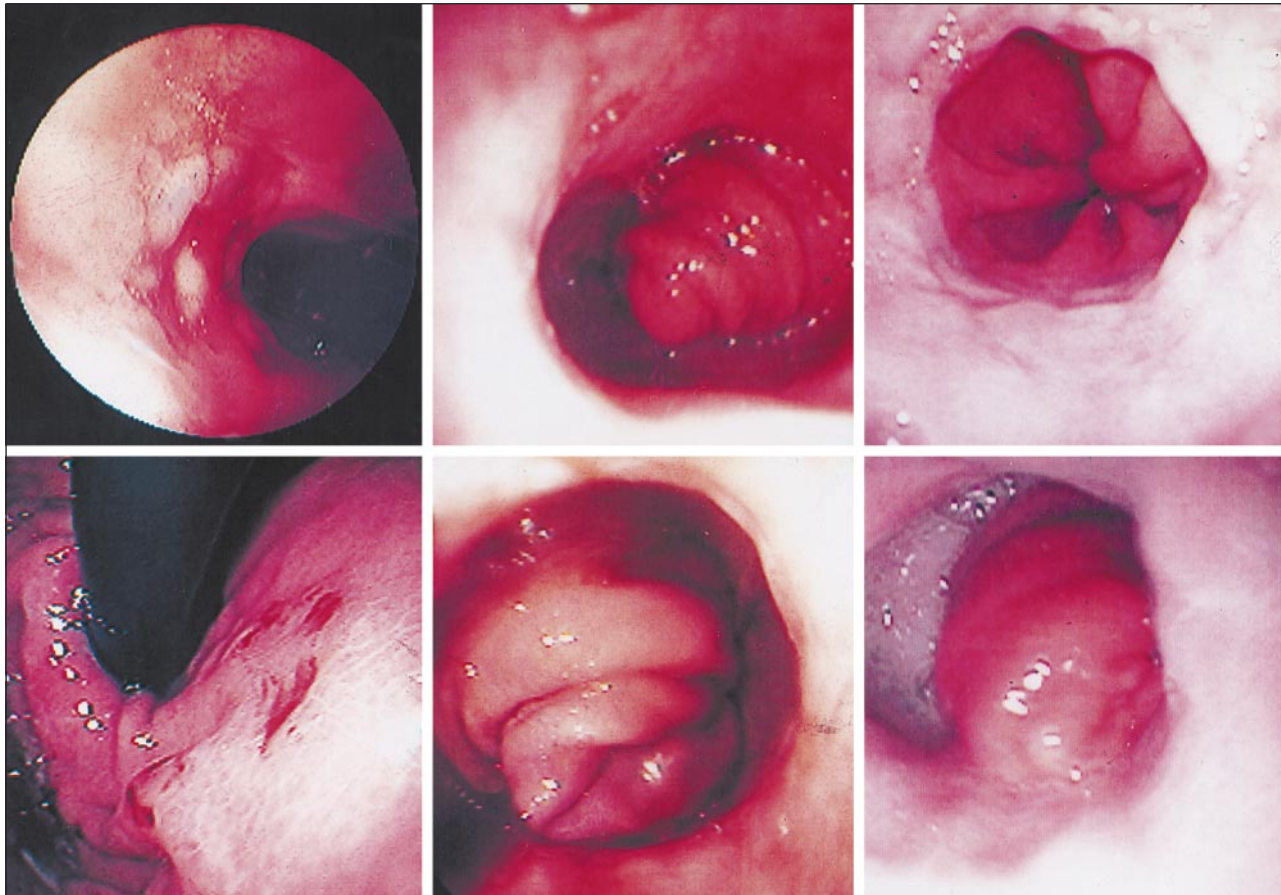


Figure 2. Hiatal hernia at rest and with intussusception following retching. Note the gastric mucosa being thrust up into the distal esophagus.

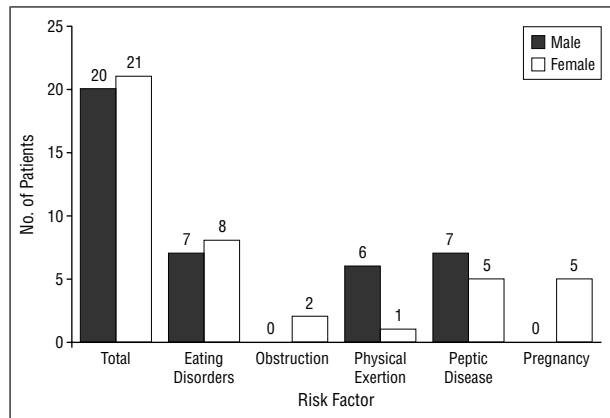


Figure 3. Risk factors for men and women.

perior mesenteric artery syndrome causing postprandial bloating, nausea, vomiting, and retching after the evening meal but not with smaller meals. The duodenal narrowing was documented by an upper gastrointestinal tract series and endoscopy and she has responded to endoscopic manipulation of the third and fourth portions of the duodenum. The 160-cm endoscope was passed repeatedly across the area of narrowing to release the acute angulation at the duodenal jejunal junction. Although she remained well for the next 6 hours, she later had a massive upper gastrointestinal tract hemorrhage that resolved spontaneously. Two hours later a Mallory-Weiss

tear was identified endoscopically that had not been noted previously. The hemorrhage probably was the result of violent retching and vomiting due to excessive insufflation of air during the endoscopic manipulation. The patient remained well and is asymptomatic 5 years later.

Another woman, aged 65 years, with malrotation of the intestine had a previous laparotomy to relieve small-bowel obstruction but the lateral peritoneal bands of Ladd had been overlooked. Endoscopically this patient had a Mallory-Weiss tear and a duodenum that was so dilated and overstretched that the duodenal wall resembled pulmonary blebs. Although she was nutritionally depleted she responded to a bypass procedure with vagotomy antrectomy and Roux-en-Y gastrojejunostomy.

A 58-year-old man developed acute small-bowel obstruction following total cystectomy and construction of an ileocecal neobladder. He had frequent postprandial nausea, vomiting, retching, and hematemesis. During the endoscopic placement of a long intestinal tube, repeated episodes of gastroesophageal intussusception were observed. He responded well to intestinal decompression and frequent small meals.

Excessive exertion was noted as a risk factor in 6 of the 22 men, was limited to the group aged 20 to 33 years, and reflected overenthusiastic participation in competitive sports. Weight lifting was the worst offender and bike racing was also implicated since the trunk lies in a horizontal position during prolonged periods of sustained physical exertion. Patients with exertion as the precipi-

tating factor responded well by simply reducing or avoiding such strenuous physical activity.

In 1 woman the risk factor of excessive exertion developed gradually during 22 years since her job involved lifting, bathing, and dressing a severely disabled child. This patient had a large hiatal hernia and extensive gastroesophageal intussusception was observed repeatedly during upper gastrointestinal tract endoscopy whenever the stomach was filled with air. It is of interest that her 2 sons, aged 20 and 30 years, respectively, have small hiatal hernias with gastroesophageal intussusception due to excessive competitive sports activity.

Peptic disease occurred in 7 men and 5 women in the group aged 37 to 56 years and included ulcers, inflammation of the esophagus, stomach, and duodenum. It was more common after cholecystectomy, in those patients who abused nonsteroidal anti-inflammatory drugs, and in those patients with stenosing duodenal ulcers.

COMMENT

Gastroesophageal intussusception is an important clinical entity for 4 reasons. First, it may present acutely with a life-threatening massive hemorrhage due to Mallory-Weiss tears or an esophageal perforation. Second, the signs and symptoms closely mimic coronary artery disease and it would be wise to perform cardiac evaluation on these patients, especially those older than 40 years.^{2,4,14-16} On the other hand, a 22-year-old man who develops symptoms after weight lifting, bike racing, or binge eating usually can be managed without a cardiac evaluation. Third, most patients with earlier stages, once identified, can be managed with lifestyle changes or with pharmacologic histamine blockers, omeprazole, or prokinetic agents. Fourth, those patients with outflow obstruction as the cause of recurrent retching, vomiting, and weight loss can be evaluated for elective surgical intervention if their lesions do not respond to medical management.

Intractability is a problem in this disease and may take 2 forms. First, congenital obstructing lesions such as malrotation with Ladd's bands, superior mesenteric artery syndrome, and annular pancreas will not respond to nonoperative measures. Also, patients themselves may be noncompliant, especially alcoholics and those with eating disorders such as bulimia and morbid obesity.

Hyperemesis gravidarum is a frequent cause of hiatal hernia with reflux esophagitis and such patients may present 10 to 15 years later with intractable heartburn, regurgitation, and dysphagia. A few of them can be identified as having gastroesophageal intussusception, as was the case with 4 women in this series. In addition, there was 1 patient with massive upper gastrointestinal tract hemorrhage occurring immediately post partum. Emergency laparotomy was necessary to suture ligate the bleeding Mallory-Weiss tear that occurred with the patient's final Valsalva maneuver at the time of delivery.

Although pregnancy was a contributing factor it was the excessive physical exertion caused by a strong Valsalva maneuver at the moment of delivery that caused the Mallory-Weiss tear.

There were no deaths and no neoplasms were identified in any of these patients. Barrett's esophagus was present in 5 patients. Mallory-Weiss tears were noted in 4 patients. Inflammatory polyps at the esophagogastric junction were noted in 4 patients.

With proper history and endoscopic examination we can identify the risk factors and the nature and stage of gastroesophageal intussusception and offer either surgical intervention or medical management. It is important to emphasize that the only reliable method of diagnosis of gastroesophageal intussusception is upper gastrointestinal tract endoscopy plus photographic documentation of the presence and degree of the intussusception, and the presence of a Mallory-Weiss tear or an associated ulcer or scar of the fundus.

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