World Journal of Gastroenterology

Submit a Manuscript: http://www.wjgnet.com/esps/
Help Desk: http://www.wjgnet.com/esps/helpdesk.aspx
DOI: 10.3748/wjg.v21.i5.1670

World J Gastroenterol 2015 February 7; 21(5): 1670-1674
ISSN 1007-9327 (print) ISSN 2219-2840 (online)

CASE REPORT

Gastrojejunostomy for pyloric stenosis after acute gastric dilatation due to overeating

Akiharu Kimura, Norihiro Masuda, Norihiro Haga, Tomokazu Ito, Kichirou Otsuka, Jyunko Takita, Hitoshi Satomura, Yuji Kumakura, Hiroyuki Kato, Hiroyuki Kuwano

Akiharu Kimura, Norihiro Masuda, Norihiro Haga, Tomokazu Ito, Kichirou Otsuka, Jyunko Takita, Hitoshi Satomura, Yuji Kumakura, Department of Surgery, Utsunomiya National Hospital, Tochigi 329-1193, Japan
Akiharu Kimura, Yuji Kumakura, Hiroyuki Kuwano, Department of General Surgical Science, Gunma University, Graduate School of Medicine, Maebashi, Gunma 371-8511, Japan
Kichirou Otsuka, Hitoshi Satomura, Hiroyuki Kato, Department of Surgery I, Dokkyo Medical University, Tochigi 321-0293, Japan
Author contributions: Masuda N performed the surgery; Kimura A and Otsuka K assisted with the surgery; Ito T, Takita J, Satomura H and Kumakura Y performed surgical management; Masuda N and Haga N revised the manuscript; Kato H and Kuwano H approved the final version of the manuscript; and Kimura A wrote the original manuscript.

Correspondence to: Akiharu Kimura, MD, Department of General Surgical Science, Gunma University, Graduate School of Medicine, 3-39-22, Showa, Maebashi, Gunma 371-8511, Japan. a-kimura0615@hotmail.co.jp
Telephone: +81-27-2208224
Fax: +81-27-2208230
Received: June 18, 2014
Peer-review started: June 20, 2014
First decision: July 21, 2014
Revised: August 5, 2014
Accepted: September 19, 2014
Article in press: September 19, 2014
Published online: February 7, 2015

Abstract

A 34-year-old woman presented at our hospital with abdominal distention due to overeating. Acute gastric dilatation was diagnosed. The patient was hospitalized, and nasogastric decompression was initiated. On hospitalization day 3, she developed shock, and her respiratory state deteriorated, requiring intubation and mechanical ventilation. Nasogastric decompression contributed to the improvement in her clinical condition. She was discharged 3 mo after admission. During outpatient follow-up, her dietary intake decreased, and her body weight gradually decreased by 14 kg. An upper gastrointestinal series and endoscopy revealed pyloric stenosis; therefore, we performed gastrojejunostomy 18 mo after her initial admission. The patient was discharged from the hospital with no postoperative complications. Gastric necrosis and perforation due to overeating-induced gastric dilatation are life-threatening conditions. Surgical intervention may be required if delayed pyloric stenosis occurs after conservative treatment. We report a case of pyloric stenosis due to overeating-induced gastric dilatation treated by gastrojejunostomy 18 mo after the initial presentation.

Key words: Acute gastric dilatation; Bulimia; Pyloric stenosis; Gastrojejunostomy; Gastric necrosis; Gastric perforation

Core tip: Acute gastric dilatation due to overeating may be life-threatening if gastric necrosis or perforation occurs. Therefore, emergency surgery is performed in most cases. This is the first report of a patient who underwent surgery more than a year after initial treatment. The number of patients with eating disorders, such as bulimia, has recently increased. For this reason in particular, physicians should be aware of acute gastric dilatation due to overeating.

Kimura A, Masuda N, Haga N, Ito T, Otsuka K, Takita J, Satomura H, Kumakura Y, Kato H, Kuwano H. Gastrojejunostomy for pyloric stenosis after acute gastric dilatation due to overeating. *World J Gastroenterol* 2015; 21(5): 1670-1674 Available from: URL: http://www.wjgnet.com/1007-9327/full/v21/i5/1670.htm DOI: http://dx.doi.org/10.3748/wjg.v21.i5.1670

INTRODUCTION

Although gastric necrosis or perforation following gastric dilatation is unusual because of the rich blood supply to the stomach, the occurrence of these conditions may be life-threatening. We report our experience with a patient who underwent gastrojejunostomy for pyloric stenosis after presenting with acute gastric dilatation due to overeating. Furthermore, we discuss the recent literature available on the subject.

CASE REPORT

A 34-year-old woman ate an overly large meal of curry, rice, and potatoes. She gradually developed abdominal distention for which she sought medical attention. The general physician decided on an expectant approach. However, she presented at our hospital because her symptoms did not improve. This patient had a history of episodes of bulimic binging, but she had failed to self-induce vomiting this time.

Physical examination at presentation revealed a blood pressure of 117/68 mmHg, a pulse rate of 100 beats/min, and a body temperature of 36.7 ℃. Her abdomen was distended, but there were no signs of peritoneal irritation. The significant laboratory test results were as follows: white blood cell count, 16700 cells/μL; C-reactive protein, 2.33 mg/dL; amylase, 1190 IU/L; serum creatinine phosphokinase, 4007 IU/L; blood urea nitrogen (BUN), 15.2 mg/dL; and creatinine, 2.33 mg/dL. Abdominal computed tomography scans revealed a massive dilation of the stomach reaching the pelvis but with no ascites or free air (Figure 1). We made a diagnosis of acute gastric dilatation due to overeating without gastric perforation or necrosis.

A nasogastric tube was inserted, and decompression and irrigation were initiated. On post-hospitalization day 3, the patient developed shock, and her respiratory state worsened. We then performed intubation and initiated mechanical ventilation. The inferior vena cava and diaphragm were compressed by her remarkably distended stomach. Further, decreased venous return and ventilatory impairment aggravated her condition. Although we considered emergency surgery, her general condition promptly improved after fluid resuscitation and respiratory care. Therefore, we continued conservative treatment. Seven days after intubation, we performed a tracheotomy. Her respiratory state gradually improved, and she was extubated 3 wk after intubation. The abdominal distention gradually improved by decompression. Thereafter, upper gastrointestinal (UGI) endoscopy and an UGI series were performed. The UGI endoscopy showed mucosal deciduation at the pyloric antrum (Figure 2A), but the UGI series showed no leakage and good passage of the contrast medium (Figure 3A). Thus, there was no evidence of pyloric stenosis. Tube feeding was initiated on hospitalization day 30 and continued until she was able to eat rice gruel. Three months after admission, she was discharged from our hospital.

While our patient was followed-up as an outpatient, her dietary intake gradually decreased. Although we recommended surgical treatment for her several times during the course of an outpatient, she rejected surgical treatment. Ultimately, she lost 14 kg from her original weight on admission. At present, her height and weight are 160 cm and 40 kg, respectively. However, because the UGI series and endoscopy revealed pyloric stenosis (Figures 2B and 3B), we performed Roux-en-Y gastrojejunostomy 18 mo after the first admission, with her consent. The postoperative course was uneventful, and she was discharged from our hospital 3 wk after surgery. The passage of contrast medium during the postoperative UGI series indicated that the anastomosis was accurate (Figure 4). At two years after surgery, the patient had gained 20 kg.

DISCUSSION

Acute gastric dilatation is a medical condition in which the stomach becomes progressively hypotonic and overstretched despite the absence of mechanical obstruction[1]. This condition can be caused by overeating, postoperative ileus, child birth, chronic debilitating affection, central nervous system damage, severe infection, and trauma[2]. Among these causes, acute gastric dilatation due to overeating is more common in females with underlying eating disorders, such as anorexia nervosa[3]. The rich collateral blood flow of the stomach generally protects the gastric wall from ischemia; gastric necrosis or perforation following gastric dilatation is unusual. However, a remarkable increase in the intragastric pressure by massive gastric dilatation can decrease the intramural blood flow, resulting in possible gastric necrosis or perforation[4]. Immediate nasogastric decompression and sufficient fluid resuscitation are necessary for the treatment of acute gastric dilatation[5]. These procedures can decrease the intragastric pressure and reduce the risk of necrosis and perforation; therefore, they should be implemented as early as possible. If gastric

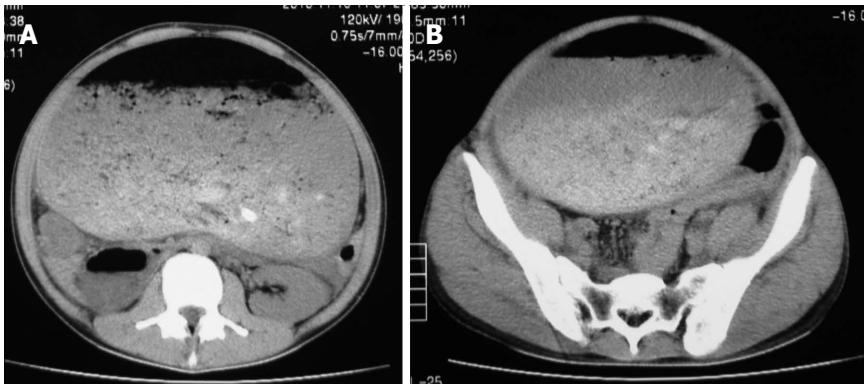

Figure 1 Computed tomography on initial admission. A. Upper abdomen B. Pelvis.

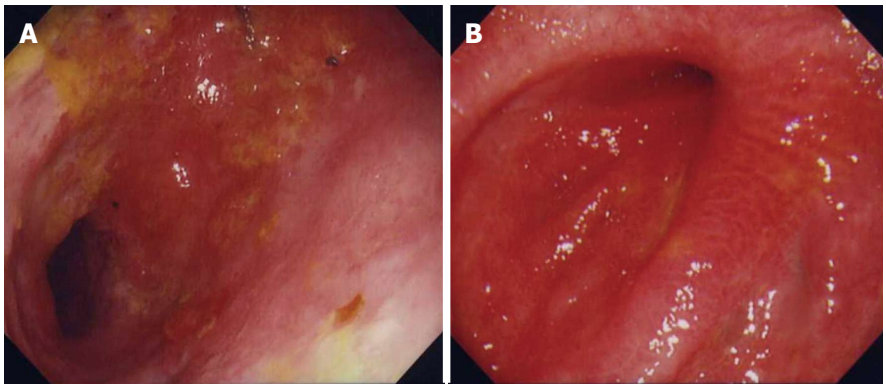

Figure 2 Gastrointestinal endoscopy revealed pyloric stenosis. A: One month after admission, gastrointestinal endoscopy revealed mucosal deciduation at the pyloric antrum, but there were no findings of pyloric stenosis; B: One year after discharge, gastrointestinal endoscopy revealed progressive pyloric stenosis.

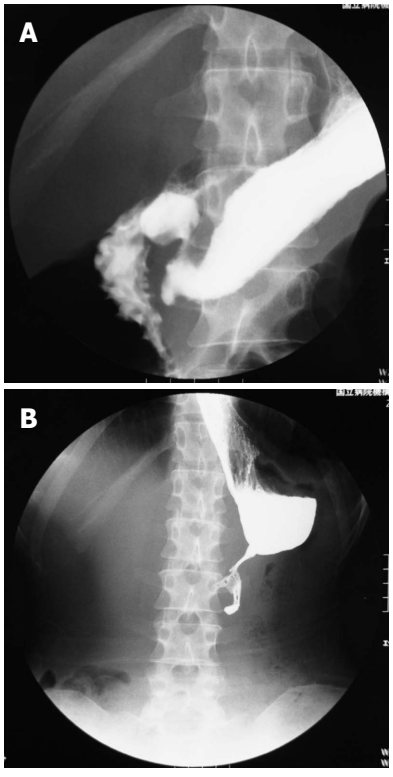

Figure 3 Gastrointestinal series showed pyloric stenosis. A: Two months after admission, an upper gastrointestinal series showed no leakage and a good passage of contrast medium; B: One year after discharge, a follow-up gastrointestinal series showed advanced pyloric stenosis.

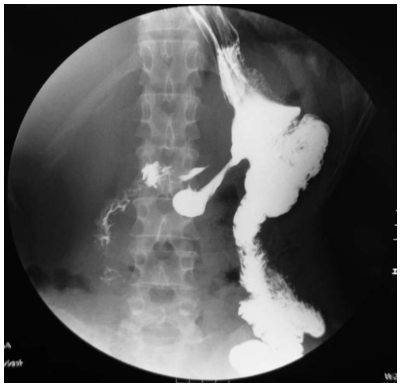

Figure 4 A postoperative gastrointestinal series showed improvement in the contrast medium passage through the stomach and intestine.

necrosis or perforation is suspected or if draining the gastric contents is difficult, immediate surgical intervention is required. Resection of the necrotic portion of the stomach is required in some cases, and total gastrectomy is required in others.

In our case, the pyloric stenosis progressed more than a year after initial treatment. The partial necrosis of the gastric wall may have been caused by acute gastric dilatation because the serum creatinine-phosphokinase level increased at onset. We promptly performed nasogastric decompression, which may have prevented complete gastric necrosis

Table 1 Reported cases of acute gastric dilatation due to overeating

Year	Ref.	Age (yr)	Sex	Underlying disease	Duration to surgery	Treatment	Outcome
2000	Nakao *et al*[5]	17	F	Anorexia nervosa	8 h	Proximal gastrectomy	Alive
2006	Barada *et al*[6]	24	F	Anorexia nervosa	NA	Nasogastric tube decompression	Alive
2011	Kim *et al*[7]	26	F	Eating disorder	NA	Nasogastric tube decompression	Dead
1987	Abdu *et al*[8]	14	F	None	Emergency	Partial gastrectomy	Alive
1987	Abdu *et al*[8]	17	F	Eating disorder	Emergency	Total gastrectomy	Dead
1987	Deret *et al*[9]	48	F	Schizophrenia	5 h	Total gastrectomy	Alive
1990	Trott *et al*[10]	17	F	Bulimia nervosa	Emergency	Gastric tube decompression (by laparotomy)	Alive
1992	Beiles *et al*[11]	24	F	Bulimia nervosa	Emergency	Partial gastrectomy	Alive
1995	Adson *et al*[12]	35	F	Eating disorder	2 d	Nasogastric tube decompression (with appendectomy)	Alive
1995	Adson *et al*[12]	30	F	Bulimia nervosa	NA	Nasogastric tube decompression	Alive
1996	Willeke *et al*[13]	19	F	Anorexia nervosa	Emergency	Partial gastrectomy	Alive
1998	Seligmann *et al*[14]	31	F	Bulimia nervosa	NA	Nasogastric tube decompression	Alive
2000	Qin *et al*[15]	12	F	None	NA	Oral gastric tube decompression	Dead
2000	Qin *et al*[15]	4	F	None	Emergency	Partial gastrectomy	Alive
2002	Holtkamp *et al*[16]	16	M	Anorexia nervosa	8 h	Aspiration of stomach contents (by laparotomy)	Alive
2003	Turan *et al*[17]	18	M	Mental retardation	Emergency	Total gastrectomy	Dead
2004	Sinicina *et al*[18]	19	M	Anorexia nervosa	NA	None	Dead
2004	Mathevon *et al*[19]	25	F	Anorexia nervosa	NA	Nasogastric tube decompression	Alive
2005	Luncă *et al*[20]	22	M	Mental retardation	NA	Nasogastric tube decompression	Alive
2006	Gyurkovics *et al*[21]	22	F	Eating disorder	Emergency	Gastrostomy	Dead
2009	Kashyap *et al*[22]	36	F	Eating disorder	Emergency	Gastrotomy	Alive
2010	García Salido *et al*[23]	16	Unknown	Anorexia nervosa	NA	Nasogastric tube decompression	Alive
2011	Hohenauer *et al*[24]	21	F	Psychosis	NA	Nasogastric tube decompression	Alive
2012	Mishima *et al*[25]	12	M	None	Emergency	Partial gastrectomy	Alive
2012	Franco-López *et al*[26]	31	F	Bulimia nervosa	Emergency	Gastrotomy	Alive
2012	Our case	34	F	Bulimia nervosa	1.5 yr	Gastrojejunostomy	Alive

NA: Not availiable.

and perforation. Because of the increase in the intragastric pressure caused by massive gastric dilatation, the intramural blood flow decreased, resulting in partial necrosis of the gastric mucosa and muscle scarring due to fibrosis. Together, these regenerative processes can lead to pyloric stenosis. In this case, acute gastric dilatation occurred only once. However, the dilatation of the stomach was severe, and it took approximately one month to drain the gastric contents completely. Therefore, delayed pyloric stenosis might have occurred.

From a literature search of the PubMed database between l966 and 2013, in addition to our patient, we retrieved 25 cases of acute gastric dilatation due to overeating (Table 1). The mean age of these patients was 22.7 (range, 4-48) years, indicating a greater frequency among young patients. There were more female patients than males (n = 20 and 5 patients, respectively, with the gender of one patient being unknown). Eighteen patients had underlying eating disorders, such as anorexia or bulimia nervosa. Sixteen patients underwent laparotomy, three of whom underwent total gastrectomy. In contrast, eight patients were treated by nasogastric decompression alone. Eleven patients underwent emergency surgery: three within several hours and one within several days. In most cases, emergency or semi-emergency surgery was performed. To the best of our knowledge, our patient was the first to undergo surgery more than a year after initial treatment. According to our literature search, six patients died despite immediate treatment, including surgical intervention. Despite the many reports of young patients, some patients died shortly after surgery or the onset of symptoms. Therefore, gastric perforation following acute gastric dilatation may be more severe than usually considered.

In conclusion, although acute gastric dilatation due to overeating is rare, physicians should be aware of its potential complications, such as gastric necrosis or perforation. Moreover, if conservative treatment is preferred over surgery, physicians should be aware of the possibility of delayed pyloric stenosis.

COMMENTS

Case characteristics

A 34-year-old woman developed abdominal distention due to overeating.

Clinical diagnosis

The abdomen was distended, but there were no signs of peritoneal irritation.

Differential diagnosis

Gastric perforation, Ascites, Gastric dilatation.

Laboratory diagnosis

White blood cell count, 16700 cells/μL; C-reactive protein, 2.33 mg/dL; amylase, 1190 IU/L; serum creatinine phosphokinase, 4007 IU/L; blood urea nitrogen, 15.2 mg/dL; and creatinine, 2.33 mg/dL. The results of her liver function tests were within normal limits.

Imaging diagnosis

Abdominal computed tomography scans revealed a massively dilated stomach reaching the pelvis without ascites or free air.

Treatment

Initially, conservative treatment by nasogastric decompression was performed, and Roux-en-Y gastrojejunostomy was performed for delayed pyloric stenosis 18 mo after the first admission.

Related reports

Twenty-five cases of acute gastric dilatation due to overeating were retrieved from a literature search of the PubMed database of cases between l966 and 2013.

Term explanation

Acute gastric dilatation is a medical condition in which the stomach becomes progressively hypotonic and overstretched, despite the absence of mechanical obstruction.

Experiences and lessons

This study not only presents the importance of immediate treatment for acute gastric dilatation but also describes the possibility of delayed pyloric stenosis after conservative treatment.

Peer-review

The article demonstrated a high mortality rate when performing emergency surgery for acute gastric dilatation due to overeating. Gastrojejunostomy is an interesting option in this situation.

REFERENCES

1 **Hiraga M**, Ono F, Omura N, Sato M, Yamamura A. A case of gastric necrosis and perforation due to overeating-induced gastric dilatation: A case report. *J Jpn Surg Assoc* 2012; **73**: 1933-1937 [DOI: 10.3919/jjsa.73.1933]

2 **Kaneda T**, Miyazawa H, Kobayashi T, Shimizu N, Katayama M, Sato T. A case of acute gastric dilatation occurring after bulimia while on a diet. *J Tokyo Med Univ* 1996; **54**: 66-68

3 **Natsume S**, Terasaki M, Goto Y, Kurumiya Y, Shingu Y. A case of gastric necrosis. *J Abdom Emerg Med* 2003; **23**: 1075-1078

4 **Usuda M**, Koizumi M, Kouda H, Nakahara C, Ueki H, Shibazaki S. Gastric necrosis caused by acute gastric dilatation after an episode of bulimia - A case report. *Jpn J Gastroenterol Surg* 1998; **31**: 2346-2349 [DOI: 10.5833/jjgs.31.2346]

5 **Nakao A**, Isozaki H, Iwagaki H, Kanagawa T, Takakura N, Tanaka N. Gastric perforation caused by a bulimic attack in an anorexia nervosa patient: report of a case. *Surg Today* 2000; **30**: 435-437 [PMID: 10819480 DOI: 10.1007/s005950050618]

6 **Barada KA**, Azar CR, Al-Kutoubi AO, Harb RS, Hazimeh YM, Abbas JS, Khani MK, Al-Amin HA. Massive gastric dilatation after a single binge in an anorectic woman. *Int J Eat Disord* 2006; **39**: 166-169 [PMID: 16252280 DOI: 10.1002/eat.20211]

7 **Kim HH**, Park SJ, Park MI, Moon W. Acute gastric dilatation and acute pancreatitis in a patient with an eating disorder: solving a chicken and egg situation. *Intern Med* 2011; **50**: 571-575 [PMID: 21422680 DOI: 10.2169/internalmedicine.50.4595]

8 **Abdu RA**, Garritano D, Culver O. Acute gastric necrosis in anorexia nervosa and bulimia. Two case reports. *Arch Surg* 1987; **122**: 830-832 [PMID: 3592974 DOI: 10.1001/archsurg.1987.01400190096021]

9 **Deret C**, Leborgne J, Rochedreux A, Jonet D, Heloury Y, Hepner Y. [Gastric fundus necrosis following acute gastric dilatation]. *J Chir* (Paris) 1987; **124**: 609-611 [PMID: 3429500]

10 **Trott GE**, Elliger T, Kerscher P, Nissen G. [Acute abdomen in anorexia nervosa. A case report]. *Fortschr Med* 1990; **108**: 525-526 [PMID: 2227753]

11 **Beiles CB**, Rogers G, Upjohn J, Wise AG. Gastric dilatation and necrosis in bulimia: a case report. *Australas Radiol* 1992; **36**: 75-76 [PMID: 1632756 DOI: 10.1111/j.1440-1673.1992.tb03083.x]

12 **Adson DE**, Mitchell JE, Trenkner SW. The superior mesenteric artery syndrome and acute gastric dilatation in eating disorders: a report of two cases and a review of the literature. *Int J Eat Disord* 1997; **21**: 103-114 [PMID: 9062834]

13 **Willeke F**, Riedl S, von Herbay A, Schmidt H, Hoffmann V, Stern J. [Decompensated acute gastric dilatation caused by a bulimic attack in anorexia nervosa]. *Dtsch Med Wochenschr* 1996; **121**: 1220-1225 [PMID: 8925754 DOI: 10.1055/s-2008-1043130]

14 **Seligmann C**, Liehr RM, Schwarz A. Massive gastric dilatation after a bulimic excess. *Med J Aust* 1998; **169**: 503 [PMID: 9847909]

15 **Qin H**, Yao H, Zhang J. Gastric rupture caused by acute gastric distention in non-neonatal children: clinical analysis of 3 cases. *Chin Med J* (Engl) 2000; **113**: 1147-1149 [PMID: 11776155]

16 **Holtkamp K**, Mogharrebi R, Hanisch C, Schumpelick V, Herpertz-Dahlmann B. Gastric dilatation in a girl with former obesity and atypical anorexia nervosa. *Int J Eat Disord* 2002; **32**: 372-376 [PMID: 12210653 DOI: 10.1002/eat.10098]

17 **Turan M**, Sen M, Canbay E, Karadayi K, Yildiz E. Gastric necrosis and perforation caused by acute gastric dilatation: report of a case. *Surg Today* 2003; **33**: 302-304 [PMID: 12707829 DOI: 10.1007/s005950300068]

18 **Sinicina I**, Pankratz H, Büttner A, Mall G. Death due to neurogenic shock following gastric rupture in an anorexia nervosa patient. *Forensic Sci Int* 2005; **155**: 7-12 [PMID: 16216705 DOI: 10.1016/j.forsciint.2004.10.021]

19 **Mathevon T**, Rougier C, Ducher E, Pic D, Garcier JM, Schmidt J. [Acute abdominal dilatation, a serious complication in the case of anorexia nervosa]. *Presse Med* 2004; **33**: 601-603 [PMID: 15226692 DOI: 10.1016/S0755-4982(04)98684-8]

20 **Luncă S**, Rikkers A, Stănescu A. Acute massive gastric dilatation: severe ischemia and gastric necrosis without perforation. *Rom J Gastroenterol* 2005; **14**: 279-283 [PMID: 16200240 DOI: 10.3305/nh.2012.27.4.5873]

21 **Gyurkovics E**, Tihanyi B, Szijarto A, Kaliszky P, Temesi V, Hedvig SA, Kupcsulik P. Fatal outcome from extreme acute gastric dilation after an eating binge. *Int J Eat Disord* 2006; **39**: 602-605 [PMID: 16752427 DOI: 10.1002/eat.20281]

22 **Kashyap AS**, Chopra D, Anand KP, Arora S, Kashyap S. Acute gastric dilatation. *Emerg Med J* 2009; **26**: 326 [PMID: 19386863 DOI: 10.1136/emj.2008.062356]

23 **García Salido A**, Martínez de Azagra A, de la Torre Espí M, Pérez Suárez E, López Neyra A, Cañedo Villarroya E. [Acute gastric dilation due to food gorging: Could be a life-threatening emergency]. *An Pediatr* (Barc) 2010; **73**: 148-149 [PMID: 20605118 DOI: 10.1016/j.anpedi.2010.05.009]

24 **Hohenauer P**, Dünser MW. Massive gastric distension. *Wien Klin Wochenschr* 2011; **123**: 592 [PMID: 21826418 DOI: 10.1007/s00508-011-1599-y]

25 **Mishima T**, Kohara N, Tajima Y, Maeda J, Inoue K, Ohno T, Kitasato A, Watanabe T, Irie J, Adachi T, Kuroki T, Eguchi S, Kanematsu T. Gastric rupture with necrosis following acute gastric dilatation: report of a case. *Surg Today* 2012; **42**: 997-1000 [PMID: 22411075 DOI: 10.1007/s00595-012-0162-4]

26 **Franco-López Á**, Badillo S, Contreras J. [Acute gastric dilatation in a bulimic patient; systemic efects]. *Nutr Hosp* 2012; **27**: 1364-1367 [PMID: 23165588 DOI: 10.3305/nh.2012.27.4.5873]

P- Reviewer: de Moura EGH, Sinha R **S- Editor**: Qi Y **L- Editor**: A **E- Editor**: Ma S

Published by **Baishideng Publishing Group Inc**
8226 Regency Drive, Pleasanton, CA 94588, USA
Telephone: +1-925-223-8242
Fax: +1-925-223-8243
E-mail: bpgoffice@wjgnet.com
Help Desk: http://www.wjgnet.com/esps/helpdesk.aspx
http://www.wjgnet.com

ISSN 1007-9327
9 771007 932045 05>