Acute afferent loop obstruction treated by endoscopic decompression

Case report and review of literature

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Ciro De Martino*, Paolo Caiazzo*, Michele Albano*, Mauro Pastore*, Pio Rocco Tramutoli*, Rosario Rocca**, Manuela Botte**, Angelo Sigillito***

"*San Carlo" Regional Hospital, Potenza, Italy*
** Emergency Surgery Unit*
*** Emergency Radiology Unit*
**** Digestive Endoscopy Unit*

Acute afferent loop obstruction treated by endoscopic decompression. Case report and review of literature

Afferent loop syndrome (ALS) is a rare complication of Billroth-II gastrojejunostomy. Most cases of ALS are caused by obstruction from adhesions, kinking at the anastomosis, internal hernia, stomal stenosis, malignancy, or inflammation surrounding the anastomosis.
A 61-years old man, who had undergone gastric resection 30 years before, was admitted at emergency room with severe abdominal pain in acute onset, nausea and vomiting. Ultrasonography and multi-detector computed tomography suggested acute ALS, due probably to adhesions or internal hernia. The patient was conducted to digestive endoscopy unit and successfully treated with endoscopic decompression of dilated afferent loop.
Open surgery is actually considered the gold-standard in treatment of ALS. However, some surgeons report a few cases treated by laparoscopic surgery, interventional radiology techniques, endoscopic decompression.
Authors suggest endoscopic decompression of acute ALS due to adhesions or internal hernia as the first treatment, especially in high-surgical-risk patients.

KEY WORDS: Afferent loop syndrome, Endoscopic decompression, Gastrectomy.

Introduction

Afferent loop syndrome (ALS) is a rare complication of Billroth-II gastrojejunostomy. Most cases of ALS are caused by obstruction from adhesions, kinking at the anastomosis, internal hernia, stomal stenosis, malignancy, or inflammation surrounding the anastomosis [1,2].

Clinically, ALS is often difficult to diagnose because its presentation may be vague and nonspecific. Abdominal pain, nausea and vomiting are the most common symtomps. Physical examination often reveals painful swelling in the upper abdominal quadrants.
Imaging is suggestive. Ultrasonography is often useful to identify the obstructive condition of jejunal loops and to show secondary signs of ALS such as biliary duct dilation. Multi-detector computed tomography (MDCT) is actually the gold-standard for the diagnosis of ALS [2,3].
Delayed diagnosis of acute ALS may result in life-threatening events as bowel ischemia or perforation. Surgery is actually considered the definitive therapy of ALS [4,5]. Specific surgical procedures depend of the primary cause of the obstruction (adhesions, anastomotic stenosis, malignancy). Nevertheless, in the last years, less invasive

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Per la corrispondenza: Dott. Ciro De Martino, Via F. Wenner 18, 84080 Pellezzano (SA) (e-mail: ciro.de@tiscali.it)

procedures (endoscopy, interventional radiology techniques) appear to be effective in treating acute ALS [6-9]. Authors report the case of a 61-years old man, affected by acute ALS due to adhesions, and successfully treated with endoscopic decompression.

Case report

A 61-years old man was admitted at emergency room with severe abdominal pain in acute onset, nausea and vomiting. The patient had undergone distal gastrectomy (Billroth-II reconstruction) for gastric ulcer perforation 30 years before and open colecistectomy for gallstones a few years laters. Last meal was "pasta with beans", assumed about 12 hours before the onset of the pain.
Physical examination revealed painful swelling in the upper right quadrant of the abdomen. Bowel sounds were present and the rectal examination found normochromic stool.
Laboratory tests were normal. Abdominal Rx was negative. Ultrasound showed fluid-filled small bowel loops at the mid-abdomen. A MDCT, with oral and intravenous contrast enhancement, was immediately executed (Figg. 1, 2). It showed:
– gastrojejunostomy type Billroth-II (antecolic reconstruction);
– partial dilation of the stomach;
– dilation of the duodenum and of the proximal part of the afferent loop, with a severe change in caliber of the loop before the gastrojejunal anastomosis;
– well-functioning efferent loop;
– dilation of the common bile duct and intra-hepatic biliary ducts.
Imaging suggested acute ALS, due probably to adhesions or internal hernia. Laboratory test were completed; blood screening, ECG and chest-Rx were performed to get the patient ready for surgery. The patient was conducted to Endoscopy Unit. Upper endoscopy showed:
– Efferent loop free of infiltrative or ulcerative lesions;
– Strong stenosis of the afferent loop.
The endoscope got over the stenosis and achieved the drainage of about 600 ml of bile. Symptoms immediately disappeared and, at the end of the exam, the swelling in the right abdomen was not palpable yet. This procedure solved the obstructive state and avoided emergency surgery.
A nasogastric tube was positioned and resuscitative and maintenance intravenous fluids were provided. Twelve hours later, the physical examination revealed effective bowel sounds and passage of flatus. Laboratory tests showed increased serum amylase (1.500 UI/ml). Nasogastric tube was removed and a liquid diet was administered.
After two days the patient underwent upper gastrointestinal study with idrosoluble contrast medium. The study revealed a physiologic progression of the contrast through efferent loop, small bowel loops and colon, until the rectum. Serum amylase normalized. The patient was discharged two days after. A low-residue, fractioned diet was strongly recommended.
Clinical followup, performed 15, 30 and 60 days after, did not show recurrence of the obstructive condition.

Discussion

ALS is caused by three different mechanisms including mechanical obstruction of the afferent loop, preferential gastric emptying into the afferent loop, and obstruction

Fig. 1: MDCT shows the fluid-filled dilated afferent loop.

Fig. 2: MDCT (3D rendering) shows the dilated afferent loop and the functioning (contrast-filled) efferent loop.

of the efferent loop resulting in preferential filling of the afferent loop [1]. This condition occurs infrequently following gastroenterotomy reconstruction.

In 1971 Jordan[10] reported the incidence of ALS as about 0.3%, but this data is from the distant past and may not match the actual current incidence rate. The overall incidence of ALS in recent literature[3] is about 2% probably because it has become more convenient for patients to seek medical advice and because of the easy availability of superior imaging modalities, such as MDCT, for diagnosing ALS, and because more patients who had undergone gastric surgery have postoperative follow-up CT.

Currently, CT plays an important role in reliably estabilishing a diagnosis and is useful for determining the site, degree, and cause of ALS[3,11]. Gayer and associates[1] demonstrated that a fluid-filled tubular structure containing small air bubbles in the right upper quadrant or crossing the midline on CT in symptomatic patients after gastroenterostomy is characteristic of a dilated afferent loop. Usually this loop appears C-shaped ("C-loop" appearance). The presence of the "keyboard sing" (valvulae conniventes projecting in the lumen) may depend of the severity of obstruction. Diagnosis of ALS using coronal reformation makes sense intuitively because it displays more bowel loops in a single image. This should theoretically improve tracing of the bowel loops, which is necessary when evalutation ALS [12].

Radiologists should develop a large knowledge of complex abdominal surgery to differentiate postoperative anatomy from complications and to identify the complications of postoperative anatomy. Only multidisciplinary team work among surgeons, radiologists and endoscopists could improve the specific skills of each operator and achieve diagnostic and therapeutic successes.

In the case described, ALS seems to be secondary to adhesions or internal hernia. Authors considered some radiologic and endoscopic features:

– MDCT did not show malignancies or "mass effect";
– MDCT did not identify signs of volvolus;
– Endoscopy did not reveal ulcerative, infiltrative or flogistic lesions of the afferent and efferent loops;
– Afferent loop decompression was effective in solving obstruction.

An other observation could be that obstructive state was probably triggered by a high-residue meal ("pasta and beans") as usually happens in adhesions-related disorders.

Most of Authors consider that the best treatment for ALS is surgery [4,5]. Conservative measures, according to them, can be temporarily used to resuscitate the patient, but definitive treatment is corrective surgery. Surgical correction is usually effected by deconstructing the Billroth-II gastrojejunostomy and restoring the continuity with an alternate method. Several procedures have been described, but the two predominant operations are Billroth-I gastroduodenostomy and Roux-en-Y gastrojejunostomy [13].

Interestingly, based on their retrospective study of 19 patients with postgastrectomy syndromes of whom three had ALS, Borrelli and associates [6] reported a significant proportion of patients required minor surgical intervention. The authors raised the question that in selected patients, laparoscopic surgery may be considered.

Vettoretto and associates[7] reported a case of afferent loop obstruction caused by an adhesive band following distal gastrectomy and reconstruction for gastric cancer. The authors performed diagnostic laparoscopy and laparoscopic lysis of adhesions, resulting in the resolution of ALS.

Fujino [8] and Kim [9] reported two similar cases of acute ALS due to adhesions and complicated by acute pancreatitis, both treated successfully by endoscopic decompression.

Conclusions

If we consider patients who had undergone non-gastric surgery, when adhesion-related obstruction develops, conservative therapies are generally employed at first: nasogastric tube, nil-per-os, intravenous fluid apport are the main primary approaches. In ALS the nasogastric tube is generally ineffective in the decompression of the afferent loop: Authors consider endoscopic decompression as an useful tool to solve this problem (Fig. 3).

In conclusion, in acute ALS due to adhesions or internal hernia, endoscopic decompression is less invasive than

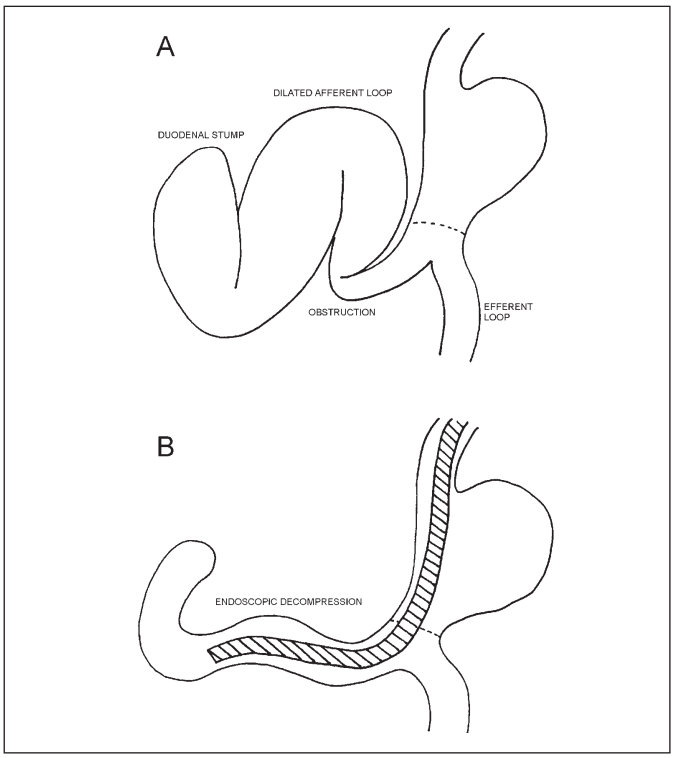

Fig. 3: Hypothetical graphic model of afferent loop obstruction (A) and endoscopic decompression (B).

surgery and could be considered as the first choice, expecially in high-surgical-risk patients. Long-term studies, involving more patients, are still necessary to confirm this suggestion.

Riassunto

La sindrome dell'ansa afferente (SAA) è una complicanza rara della gastrodigiunostomia secondo Billroth II. La maggior parte dei casi di SAA è dovuta ad aderenze, inginocchiamento dell'anastomosi, ernia interna, stenosi anastomotica, infiltrazione neoplastica o edema infiammatorio dell'anastomosi.
Un uomo di 62 anni, sottoposto 30 anni prima a resezione gastrica, è giunto in pronto soccorso con dolore addominale acuto, nausea e vomito. L'ecografia e la TC addome hanno ipotizzato una occlusione acuta dell'ansa afferente, dovuta presumibilmente a sindrome aderenziale o ernia interna. Il paziente è stato condotto in unità di endoscopia digestiva e trattato con successo con decompressione endoscopica dell'ansa afferente dilatata.
La chirurgia tradizionale è attualmente considerata il gold-standard nel trattamento della SAA. Alcuni chirurghi, tuttavia, hanno riportato diversi casi trattati con chirurgia laparoscopica, radiologia interventistica, decompressione endoscopica.
Gli Autori suggeriscono il trattamento endoscopico della SAA acuta, dovuta a sindrome aderenziale o ernia interna, come primo trattamento, in particolare nei pazienti ad alto rischio chirurgico.

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