

## Lumen reconstruction with magnetic compression anastomosis technique in a patient with complete esophageal stricture

B. Ödemiş<sup>1</sup>, B. Başpınar<sup>1</sup>, M.B. Durak<sup>1</sup>, O. Coşkun<sup>2</sup>, S. Torun<sup>3</sup>

(1) Ankara City Hospital, Department of Gastroenterology and Hepatology, Ankara, Turkey; (2) Amasya University, Faculty of Medicine, Department of Gastroenterology, Amasya, Turkey; (3) Düzce University, Faculty of Medicine, Department of Gastroenterology, Düzce, Turkey.

### Abstract

**Background:** Complete esophageal obstruction (CEO) is a rare condition of which treatment options are challenging. Surgery is the main treatment with high morbidity and mortality rates. Magnetic compression anastomosis (MCA) is a novel technique developed to restore lumen patency in gastrointestinal and biliary tracts. However, MCA experience is limited in respect of esophageal strictures.

**Case Report:** We present a 26-year-old patient having CEO. Magnets are inserted endoscopically to both sides of the obstructed area via oral and retrograde (through the gastrostomy tract) route. On day 8, magnets stuck together and were removed endoscopically through the oral route. Subsequently, sessions of balloon dilatations and triamcinolone injection were performed. The patient's complaint of aphagia resolved after the treatment process.

**Conclusion:** In conclusion, MCA is an alternative technique that can be used to restore lumen patency in esophageal strictures and also avoids complications of surgical interventions. (*Acta gastroenterol. belg.*, 2022, 85, 393-395).

**Keywords:** Esophageal dysphagia, esophageal stricture, magnetic compression anastomosis.

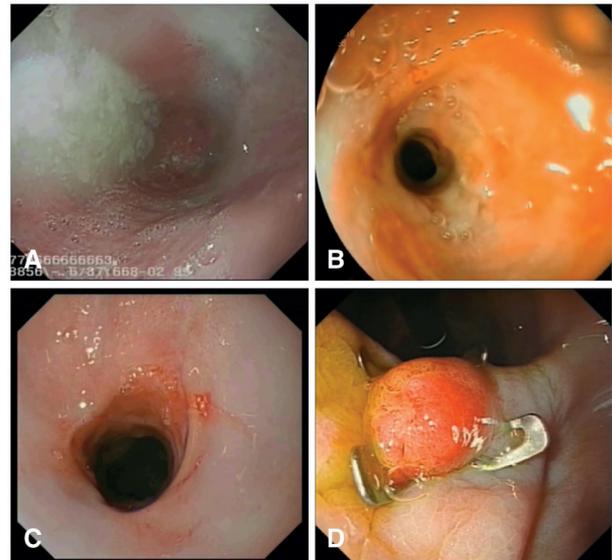


Figure 1. — A: Complete esophageal obstruction from antegrade endoscopic view. B: Restored esophageal lumen on the 8<sup>th</sup> day of successful magnetic compression anastomosis. C: Treated stenotic area after sessions of steroid injections and balloon dilatation. D: Closure of existing laparoscopically opened stomach orifice with OTSC.

### Introduction

Complete esophageal obstruction (CEO) is a rare and difficult-to-treat condition. Endoscopic balloon dilatation, stent implantation, bougie dilatation are not feasible to provide lumen restoration in CEO. Surgical revision or resection with colon transposition are options in the CEO; however, they harbor high morbidity and mortality (1). Novel techniques such as antegrade-retrograde endoscopic recanalization with transillumination and endoscopic submucosal dissection have variable efficacy, each with its limitations and range of complications.

Magnetic compression anastomosis (MCA) is a recent technique described by Yamanouchi et al. providing passage construction and reconstruction for lumenous organs(2). MCA has been employed in different areas such as biliary obstructions, therapeutic fistula formation in the gastrointestinal tract; however, its use in esophageal obstruction is rare. Herein we present a case with CEO successfully treated with the MCA technique.

### Case presentation

A 26-year-old male patient from Niger applied with complaints of aphagia and weight loss. His complaints began in 2005, and he could tolerate a diet with liquid and soft foods. He denied any foreign body swallow, caustic

ingestion, odynophagia, inflammatory process, history of radiotherapy. His complaints worsened, and in 2015, esophageal resection and end-to-end anastomosis surgery was performed in Niger. Pathological examination results cannot be reached, although the patient stated that it was a benign stricture. The second operation was performed as stricturoplasty when the symptoms recurred in 2016. During follow-up, tracheoesophageal fistula developed and operated in a third surgery session. In time, due to the patient's inability to swallow, including liquids, laparoscopic gastrostomy was performed to provide nourishment.

Correspondence to: Batuhan Başpınar, MD, Ankara City Hospital, Department of Gastroenterology and Hepatology, Bilkent Avenue, 06800, Çankaya, Ankara, Turkey. Phone: +90 555 883 37 67. Email: batuhanbaspinar@gmail.com

Submission date: 11/11/2020  
Acceptance date: 17/01/2021

## Procedure

Upon admission, upper gastrointestinal endoscopic examination (GIF-Q260, Olympus, Japan) yielded complete stenosis at the mid-esophageal level (Figure 1A). No passage of radiocontrast agent through stenosis was observed. Simultaneously, a pediatric endoscope (EG530-FP, Fujinon, Japan) was inserted through the gastrostomy tract after removal of the feeding tube and there was lack of connection in between antegrade and retrograde endoscopes (Figure 2A). Thereafter, the antegrade-retrograde endoscopic recanalization with transillumination technique was attempted but failed. A 18x7mm N35 cylindrical neodymium magnet (remanence 11.7-12.2 kGs) was inserted to the proximal pouch of obstruction via oral route with duodenoscope (TJV-260V, Olympus, Japan). Subsequently, a 10x5mm N35 cylindrical neodymium magnet (remanence 11.7-12.2 kGs) was inserted to the distal pouch of obstruction via the gastrostomy tract with the pediatric endoscope. The fluoroscopic examination demonstrated the alignment of magnets (Figure 2B).

On the 8th day of the procedure, they were seen coupled (Figure 2C) and removed endoscopically via the oral route (Figure 2D). Subsequent endoscopic examination signified stenosis (5 mm in depth and 5 mm in length) (Figure 1B). Study with proximally given radiocontrast agent yield passage to distal esophagus and stomach. The stenotic area was dilated with 8mm and 12mm endoscopic balloon dilatation (Micro-Tech Nunjing Co. Ltd.), respectively. The patient was able to swallow by day 8. In 4 sessions six days apart, 0,5 cc of 1:1 saline diluted 40 mg/ml triamcinolone therapy applied all quadrants of proximal and central parts of stenosis. In these sessions, endoscopic dilatation was performed with a 16mm balloon (Micro-Tech Nunjing Co. Ltd.). On the 24th day, esophageal opening without stenosis was observed (Figure 1C) and a guidewire was inserted into the stomach via the gastrostomy tube. After the removal of the gastrostomy tube, a guiding catheter was placed in order to protect the abdominal wall and other tissues beneath. The guidewire was taken out endoscopically, and over-the-scope clip (OTSC) was inserted through guidewire. Existing laparoscopically opened stomach orifice was closed with OTSC (Figure 1D).

## Discussion

Esophageal stricture is a common medical condition mostly caused by gastroesophageal reflux disease, foreign body or caustic ingestion, tumors, and radiotherapy (1,3). Dysphagia is the chief complaint in esophageal stricture. However, the advanced disease results in CEO, which is a rare condition presented with aphagia. CEO impairs quality of life, and its management is quite challenging for clinicians. Surgical interventions, including revision or resection with colon transposition, possess high morbidity and mortality. Although less invasive techniques such

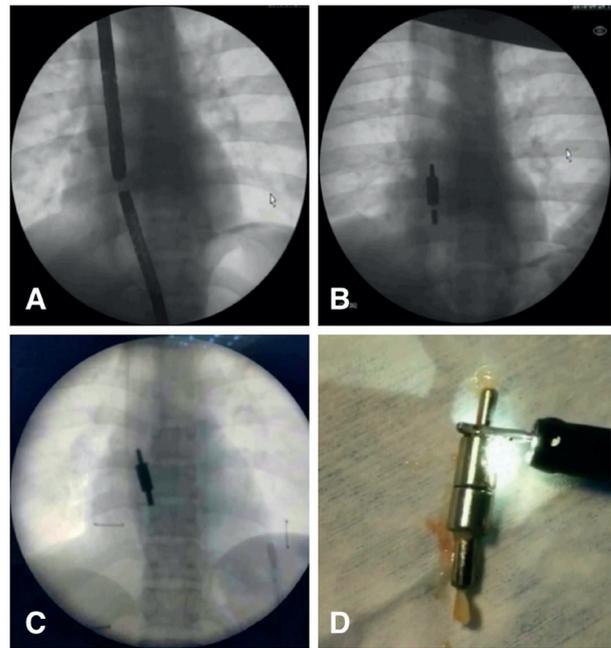


Figure 2. — A: Complete esophageal obstruction demonstrated on fluoroscopy with lack of connection in between antegrade and retrograde endoscopes. B: Alignment of magnets on fluoroscopic view (Day 0). C: Coupled magnets are seen on the 8<sup>th</sup> day after insertion. D: Coupled magnets taken out after successful magnetic compression anastomosis.

as antegrade-retrograde transillumination technique and submucosal recanalization are employed recently, their effectivity and complications vary in the literature. Additionally, they can be used in selected patients due to technical limitations such as length of the obstructed area. Patients who could not benefit from treatment options are followed by a gastrostomy tube.

MCA is a recently developed technique to ensure canal patency in lumenous organs. MCA has been used for biliary strictures, fistula formation in gastrointestinal obstructions. There are limited human trials of MCA usage in esophageal strictures. In literature, the MCA technique was reported to be used in esophagus atresia in pediatric patients (4,5). Furthermore, Parlak et al. successfully treated a patient with oro-esophageal obstruction caused by radiotherapy following an operation for laryngeal cancer (6). To best of our knowledge, our case is the first intervention aiming to treat pure esophageal complete obstruction with MCA.

MCA is a practical technique for restoring lumen opening in complete esophageal obstruction. MCA can be preferred over antegrade-retrograde endoscopic recanalization, which may lose its effectivity in respect of the length of the obstructed area. Nevertheless, there is no sufficient data considering MCA trial in esophageal stricture, and thus, an optimal length that can be suitable for MCA technique is lacking.

In conclusion, MCA is a non-invasive alternative endoscopic technique in the treatment of complete

esophageal obstruction. Further studies are needed to standardize the MCA application in this field.

#### Conflict of interest statement

None

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