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Esophageal perforation post pneumatic dilatation for achalasia managed by esophageal stenting

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Patient: Female, 82
Final Diagnosis: Achalasia
Symptoms: Nocturnal regurgitation • weight loss
Medication: —
Clinical Procedure: Esophageal stenting
Specialty: Gastroenterology • Hepatology

Objective: Unusual or unexpected effect of treatment

Background: Pneumatic dilatation is one of the most effective methods for treating achalasia. Esophageal perforation is the most serious complication after pneumatic dilatation and has been reported to occur in the range of 1 to 4.3%. The appropriate management of esophageal perforation can range from conservative medical treatment to surgical intervention.

Case Report: We report a case of an 82-year-old male who had an 8 month history of dysphagia for solid and liquids, a 10 lb weight loss and nocturnal regurgitation. The diagnosis of achalasia was established by endoscopic; barium and manometric criteria. He underwent a pneumatic dilation with a 30 mm Rigiflex balloon. A confined or limited esophageal perforation projecting into the mediastinum and located 1–2 cm above the diaphragm was confirmed by a gastrografin swallow study performed immediately after the procedure. There was some accompanying epigastric abdominal pain. Patient was treated later that day by placing a fully covered metallic esophageal stent in addition to antibiotics, proton pump inhibitor, and fasting. Patient was discharged home 3 days later able to eat liquid-soft foods. Follow up endoscopy 2 weeks later and a gastrografin swallow showed a completely healed perforation and the stent was removed. Symptomatically he has done well, with no dysphagia or heartburn at six and twelve months follow up.

Conclusions: Early esophageal stenting for esophageal perforation after pneumatic dilation for achalasia is a treatment option which accelerates healing shortens recovery period, as well as decreasing hospital stay and costs.

Key words: esophageal perforation • pneumatic dilation • esophageal achalasia • esophageal stenting

Full-text PDF: <http://www.amjcaserep.com/download/index/idArt/889637>

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Background

Achalasia is an esophageal smooth muscle motility disorder in which there is a failure of relaxation of lower esophageal sphincter (LES) often accompanied by a loss of peristalsis in distal esophagus due to loss of inhibitory intrinsic neurons of the esophageal myenteric plexus [1].

Pneumatic dilatation (PD) of the esophagus remains one of the most effective long term methods of treating achalasia [2]. Pneumatic dilatation decreases the LES pressure by weakening and tearing the smooth muscle fibers of the esophagus [3,4]. Esophageal perforation is one of the most common complications post PD for achalasia and occurs in approximately 1 to 4.3 percent of patients in most recent series [2,5–7]. The appropriate management of esophageal perforation involves a wide spectrum of options, ranging from conservative treatment to surgical intervention.

We report our experience in treating a patient who had esophageal perforation post PD treated successfully by esophageal stenting as well as conservative medical care.

Case Report

This is an 82-year-old male with past medical history of hypertension, hyperlipidemia, gastroesophageal reflux disease (GERD) and coronary artery disease. Patient presented with an eight month history of dysphagia for both liquid and solid food associated with regurgitation of a foamy like material at night. Patient limited his oral intake due to these symptoms and reported a 10 lb weight loss over the last eight months. Patient was treated for many years for GERD with proton pump inhibitors (PPI). Even after the dysphagia began the PPIs were continued but were ineffective. Patient then underwent an Esophagogastroduodenoscopy (EGD) which showed a dilated esophagus and some evidence of reflux esophagitis.

Achalasia was suspected so patient underwent an esophageal manometry study which confirmed the diagnosis of achalasia with an aperistaltic esophageal body and non relaxing lower esophageal sphincter. The patient was scheduled for pneumatic dilatation. An informed consent was obtained; all the risks, benefits and alternatives were discussed with the patient.

Under general anesthesia patient underwent pneumatic esophageal dilatation using a Rigiflex dilator with a 30 mm balloon employed and pressure of 16 PSI. Endoscopy immediately after the procedure raised the concern of a small tear in the distal esophagus so a gastrografin swallow study was ordered to rule out any perforation. After extubation patient was complaining of mild to moderate epigastric pain but denied any chest pain, fever, cough

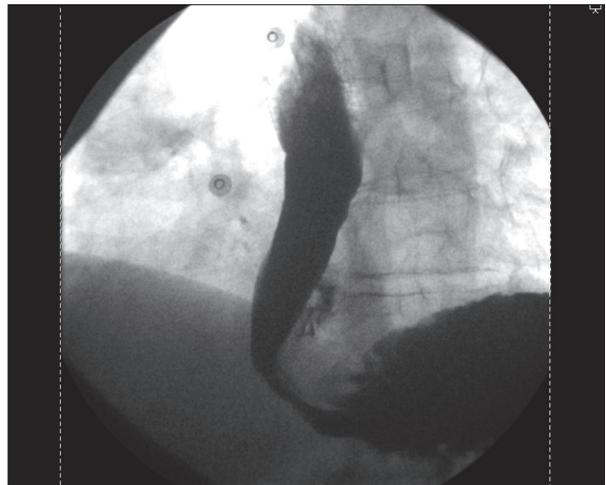


Figure 1. First gastrografin swallow study showing a distal esophageal perforation.

or shortness of breath. The patient was afebrile and hemodynamically stable. The patient was kept NPO and the gastrografin study was performed which showed a contained perforation in the very distal esophagus just above the gastroesophageal junction level which was projecting about 1–2 cm into the mediastinum but localized with no leaking into the pleural cavity (Figure 1)

The patient was brought back to the endoscopy unit and a fully covered metallic stent was placed in the distal esophagus with a diameter of 23 mm and 10 cm in length. The time between the initial endoscopy and stent placement was approximately 6 hours. Patient was kept NPO and was started on intravenous broad spectrum antibiotic (Piperacillin-Tazobactam 4.5 Gm q8h) and admitted to the hospital to continue medical treatment.

Day 1 post-stenting the patient was complaining of mild nausea and epigastric discomfort; he remained afebrile and had stable vital signs with a small increase in white blood cell count to 14,000. Day 2 post-stenting he improved clinically without significant nausea or abdominal discomfort. A follow up gastrografin swallowing study was performed, which showed the stent *in situ* with a minute projection of contrast extravasation at the site of the previous perforation with some contrast hold up in the distal esophagus; however the contrast did pass to the stomach (Figure 2). Patient was allowed to start clear fluid diet.

Day 3 post-stenting the patient remained afebrile and hemodynamically stable and leukocytic count had returned to normal. He tolerated fluids well without nausea or vomiting and his diet was advanced to a regular soft. The patient was discharged home with Augmentin 850mg PO BID for 10 days; he was scheduled for an EGD and stent removal after 2 weeks.

When he presented at that time he had no dysphagia and he was eating a regular diet. The EGD was performed and a safe

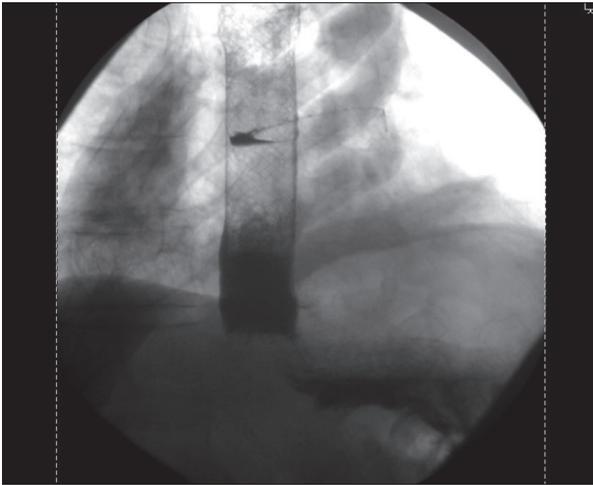


Figure 2. A Follow up gastrografin swallowing study showing an esophageal stent in the distal half of the esophagus.

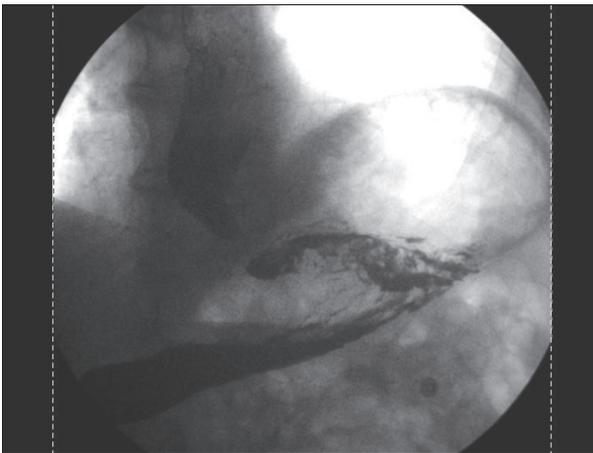


Figure 3. A gastrografin swallow study done at the time of stent removal which was two weeks after the placement. This image shows complete healing of the perforation and good flow of the contrast from the esophagus into the stomach.

removal of the stent was accomplished. A white healed scar was seen at the area of the perforation.

A follow up gastrografin swallow showed no contrast extravasation and completely healed perforation (Figure 3). Follow up in clinic at one, six and twelve months later confirmed sustained symptom improvement. As far as no dysphagia occasional heartburn was still in the background as it had been for some years before the diagnosis of achalasia.

Discussion

Pneumatic dilation to abruptly dilate the lower esophageal sphincter is one of the techniques used in the management of

achalasia. It is still the first-line therapy for the treatment of achalasia, while laparoscopic Heller myotomy with partial fundoplication (Dor or Toupet) is typically reserved for patients who have persistent dysphagia after one or more dilatations or who have suffered a perforation during an endoscopic balloon dilatation [8].

Symptomatic relief can be achieved in 90% after one year and 86% after two years in patients treated with PD compared with a rate of 93% after 1 year and 90% after 2 years for laparoscopic Heller's myotomy (LHM) [8]. The main advantage of the PD technique is that it is less invasive than surgical myotomy with a fewer complications and mortality than LHM [9]. However, PD has about a 25–50% chance of that the patient will require another procedure within five years. The esophageal perforation rate post PD is 1 to 4.3 percent while the postoperative complication from performing a myotomy including symptomatic esophageal perforation and intraoperative perforation is approximately 5–6% [2,10].

Rigiflex pneumatic dilatation with balloon sizes of 30 to 45 mm in diameter have resulted in perforation rates of less than 5%. Prior to this method, perforation rates with the Brown-McHardy dilators were at best in the 10% range. Now the perforation size is often a "microperforation" or very contained perforation. In the past with large perforations, the mortality rate from emergency surgery could approach 20% [11]. In a prospective 7-year follow-up study on 32 patients with idiopathic achalasia, endoscope-guided pneumatic dilation proved safe and effective, with only one perforation occurring and 61.7% cumulative clinical remission at the 7th year of follow-up; older patients (>45 years) had a better overall outcome [12].

Acute perforations are potentially life-threatening emergencies in which prompt closure is required to avoid contamination of visceral spaces [13]. The management of patients with esophageal perforation following esophageal dilation depends upon the severity of the perforation and the elapsed time between the perforation and the diagnosis [14]. All patients with an esophageal perforation regardless of the management strategy require avoidance of food intake, parenteral nutritional support, intravenous broad spectrum antibiotics and PPI [15]. In more severe and symptomatic settings surgical intervention with drainage of the fluid, closure of the perforation and a Heller myotomy may be required. Other less severe cases of iatrogenic esophageal perforation in patients with achalasia and specifically now in the era of the rigiflex dilators technique can be managed non surgically as reported in the literature [16].

Esophageal stenting has been recently used in the treatment of patients with iatrogenic perforations after dilatation of caustic esophageal strictures with immediate and complete sealing of the ruptures [17]. Removable plastic or covered metal esophageal stents are useful in treating some patients with esophageal

perforation and are placed on a temporary basis. If an esophageal stent is used then we recommend a repeat esophagram should be obtained within 1-2 days to document that the perforation has been sealed prior to discharging the patient [18].

Once confirmed, the patient may resume oral intake (typically clear liquids to start, with advancement of the diet as tolerated). The optimal amount of time to leave the stent in place has not been established. Stenting the bile duct is usually for six to eight weeks following insertion, but the longer the stent is left in place, the more likely that granulation tissue will develop which could make stent removal difficult [19,20]. In this case two weeks seems appropriate to achieving healing and still result in an easy removal from the esophagus.

References:

1. Eckardt VF et al: Pneumatic dilation for achalasia: late results of a prospective follow up investigation. *Gut*, 2004; 53: 629–33
2. Vanuytsel T et al: Conservative Management of Esophageal Perforations During Pneumatic Dilation for Idiopathic Esophageal Achalasia. *Clin Gastroenterol Hepatol*, 2012; 10(2): 142–49
3. Sabharwal T et al: Balloon Dilatation of Esophageal Strictures/Achalasia. *Semin Intervent Radiol*, 2004; 21(3): 149–55
4. Chuah S-K: Endoscope-guided pneumatic dilation for treatment of esophageal achalasia. *World J Gastroenterol*, 2010; 16(4): 411–17
5. Karamanolis G, Sgouros S, Karatzias G et al: Long-term outcome of pneumatic dilation in the treatment of achalasia. *Am J Gastroenterol*, 2005; 100: 270–74
6. West RL, Hirsch DP, Bartelsman JF et al: Long term results of pneumatic dilation in achalasia followed for more than 5 years. *Am J Gastroenterol*, 2002; 97: 1346–51
7. Vanuytsel T, Lerut T, Coosemans W et al: Conservative management of esophageal perforations during pneumatic dilation for idiopathic esophageal achalasia. *Clin Gastroenterol Hepatol*, 2012; 10: 142
8. Boeckxstaens GE, Annese V, des Varannes SB et al: Pneumatic dilation versus laparoscopic Heller's myotomy for idiopathic achalasia. *N Engl J Med*, 2011; 364: 1807–16
9. Lynch KL, Pandolfino JE, Howden CW, Kahrilas PJ: Major complications of pneumatic dilation and Heller myotomy for achalasia: single-center experience and systematic review of the literature. *Am J Gastroenterol*, 2012; 107(12): 1817–25
10. Campos GM, Vittinghoff E, Rabl C et al: Endoscopic and surgical treatments for achalasia: a systematic review and meta-analysis. *Ann Surg*, 2009; 249: 45
11. Vantrappen G, Hellemans J: Treatment of achalasia and related motor disorders. *Gastroenterology*, 1980; 79: 144
12. Chuah S-K, Hu T-H, Wu K-L et al: Clinical remission in endoscope-guided pneumatic dilation for the treatment of esophageal achalasia: 7-year follow-up results of a prospective investigation. *J Gastrointest Surg*, 2009; 13: 862–67
13. Coda S, Antonellis F, Sagkaropoulos S et al: Complete Endoscopic Closure (Clipping) of a Large Esophageal Perforation After Pneumatic Dilation in a Patient with Achalasia. *J Laparoendosc Adv Surg Tech A*, 2012; 22(8): 815–18
14. Madanick RD: Medical management of iatrogenic esophageal perforations. *Curr Treat Options Gastroenterol*, 2008; 11: 54
15. Molina EG, Stollman N, Grauer L et al: Conservative management of esophageal nontransmural tears after pneumatic dilation for achalasia. *Am J Gastroenterol*, 1996; 91(1): 15–18
16. Scatton O, Gaudric M, Massault PP et al: Conservative management of esophageal perforation after pneumatic dilatation for achalasia. *Gastroenterol Clin Biol*, 2002; 26(10): 883–87
17. Van Heel NCM, Haringsma J, Spaander MCW et al: Short-term esophageal stenting in the management of benign perforations. *Am J Gastroenterol*, 2010; 105: 1515–20
18. Johnsson E, Lundell L, Liedman B: Sealing of esophageal perforation or ruptures with expandable metallic stents: a prospective controlled study on treatment efficacy and limitations. *Dis Esophagus*, 2005; 18: 262
19. Fischer A, Thomusch O, Benz S et al: Nonoperative treatment of 15 benign esophageal perforations with self-expandable covered metal stents. *Ann Thorac Surg*, 2006; 81: 467
20. Freeman RK, Van Woerkom JM, Ascoti AJ: Esophageal stent placement for the treatment of iatrogenic intrathoracic esophageal perforation. *Ann Thorac Surg*, 2007; 83: 2003

Conclusions

In summary this report shows that stenting is useful to close an acute esophageal perforation caused by an endoscopic balloon dilatation thus preventing possible leakage of fluids in the mediastinum with a high risk of infection. Provided that this complication is promptly recognized, stenting should be considered as a safe technique to attempt to immediately seal an iatrogenic esophageal perforation in achalasia, which results in shortening the patient's hospitalization stay with attendant economic benefit as well as an effective outcome as demonstrated by our patient.