

Successful Use of Biliary Duct Balloon Dilator in Repairing Post-Surgical Esophageal Stricture in a Premature Infant

Imad Absah¹, *Manoochehr Karjoo², Mirza B. Beg³

¹ Assistant Professor of Pediatrics and adolescents, Division of Pediatric Gastroenterology, Mayo Clinic College of Medicine, Rochester MN, USA.

² Professor of Pediatrics and adolescents, Division of Pediatric Gastroenterology, SUNY Upstate Medical University, Syracuse NY, USA.

³ Assistant Professor of Pediatrics and adolescents, Division of Pediatric Gastroenterology, SUNY Upstate Medical University, Syracuse NY, USA.

Abstract

Congenital Esophageal Atresia (EA) needs to be surgically corrected as soon as possible. Some will present with post surgical stricture that needs to be dilated by a balloon dilator. This procedure is difficult in premature born due to infant esophageal size and availability of equipments. We hereby report the first case in a premature infant with post surgical esophageal stricture of esophageal atresia by the use of biliary duct balloon dilator.

Key Words: Balloon dilator, Esophagus, Stricture.

*** Corresponding Author:**

Manoochehr Karjoo, MD, Division of Pediatric Gastroenterology, SUNY Upstate Medical University, Syracuse NY, USA.

Email: karjoom@upstate.edu

Received date May 17, 2015 ; Accepted date: May 20, 2015

Introduction

The most common gastrointestinal atresia is congenital esophageal atresia (EA). Blind proximal esophagus with fistula between distal esophagus and the Tracheoesophageal Fistula (TEF) is the most common type. Treatment is by extra-pleural surgical repair of the esophageal atresia and closure of the tracheoesophageal fistula. Development of post-surgical esophageal stricture is a common complication. These anastomotic strictures can cause dysphagia, feeding difficulties, feeding tubes (nasogastric or gastrostomy) dependency. For partial strictures conservative endoscopic management is preferred. A major limiting factor to this approach is the esophageal abnormal anatomy and motility. Endoscopic dilatation can be performed successfully with over guidewire antegrade dilation using Savary- Gilliard bougies (1) or under direct visualization using balloon dilatation under fluoroscopic guidance (2).

Sever anastomotic stricture may not be traversed with a standard guidewire, for that a retrograde gastric endoscopy can be considered. This approach has been associated with many complications (infection, bleeding and formation of fistula) especially in patients who require gastrostomy tube placement for this retrograde approach (3).

The use of biliary type guidewire in dilating strictures that are not traversable endoscopically has been reported (4). The use of biliary-type guidewire in dilating sever anastomotic esophageal stricture post-surgical TEF repair has not been described. We describe a safe, successful and feasible technique to dilate sever esophageal stricture in a two month- old female infant that was otherwise inaccessible by a standard antegrade endoscopic approaches.

Case report

A newborn weighting 2690-gram was born at 35 weeks of gestation. Prenatal sonogram showed the most common variant of EA and TEF with treatment included surgical repair of the EA and TEF at day 8 of life. The fistula was transected about 3 mm from the tracheal wall. The gap between the upper and lower esophagus was long, therefore a livaditis procedure to gain an extra 1 cm of length to the upper esophagus was performed in which a Fogarty catheter was pushed down into the upper esophagus and its balloon was blown up. A circular myotomy 360 degrees around the esophagus was performed to gain the length necessary without any incision in the mucosa (5). That resulted in a tight, but a reasonable anastomotic distance between the upper and lower ends of the esophagus.

As a result of progressive dysphagia on postoperative day 44, the patient was referred to pediatrics Gastroenterology for upper endoscopy and likely balloon dilation of her anastigmatic stricture that was seen on a barium study. The presumption was that the esophagus would have narrowing around the anastomosis area. The first two attempts to dilate on Post-Operative day 45 and day 51 were unsuccessful. A slim pediatric endoscope (GIF-XP 160, Olympus America Inc, Melville, NY), was used and an anastomotic stricture was visualized at 12 cm from the mouth. Initially an attempt to pass 8 French (2.7 mm) Foley catheter (Cook, Bloomington, NJ) was not successful. Then we tried sliding 5 French (1.67mm) Foley catheters (Cook, Bloomington, NJ) with balloon into the esophageal lumen with some difficulties. Due to this no dilatation was done so a Nasogastric (NG) tube was placed.

On post-operative day 71, the infant was receiving feeding through the NG tube and is gaining and growing with no vomiting

and normal bowel movement. The upper endoscope was inserted and at 12 cm from the mouth, again a very tight esophageal stricture with esophageal lumen less than 6 mm was identified. NG tube was removed and through the scope guide wire (Terumo, Tokyo, Japan) was passed into the small stomach under direct vision. With the help of biliary balloon dilatation catheter starting from 4 mm size, balloon dilatation was done. Another dilatation was done with the help of 6mm biliary balloon dilatation catheter and than an attempt with 8 mm biliary balloon dilation was done with success. At this time, minimal oozing of blood was noted. After this initial successful biliary duct balloon dilator dilation, Savary dilators starting from 21 French (8mm) followed by 24 French were used with minimal oozing of blood. This time attempt to advance the Olympus GIF-XP scope was done but due to resistance, avoided to push it down to stomach. Another approach was done on day 120 using the 0.035 inch guided wire and the Biliary Balloon dilator. At this time, we were able to advance the Olympus GIF-XP endoscope was successful. After this few more dilatation with regular esophageal balloon dilators were done with great success. The child did not require any esophageal surgical intervention after these balloon dilatations.

Discussion

Endoscopic management of post-surgical esophageal strictures is usually sufficient and successful, few cases of sever strictures or complete obstruction may need surgical interventions. In these cases the use of Biliary Balloon dilators can be the solution, before sending them for invasive surgical options like gastric or colonic interposition.

Our case with a primary esophageal atresia repair complicated by subsequent anastomotic stenosis that underwent a

successful procedure by using Biliary duct balloon dilator to dilate the esophageal lumen.

The long-term patency and success of this procedure in this individual patient will need to be further evaluated with follow-up studies as clinically indicated. To our knowledge, there is no other case documented in the literature of an attempted esophageal dilatation using the biliary balloon before, except for one case in which the biliary accessories were used to bypass very tight esophageal stricture in 57 years old laryngeal cancer patient with esophageal stricture post radiation therapy (6).

Inserting the wire under direct visualization through the scope confirms in the stomach decreases the risk of wire placement related perforation under fluoroscopy. After confirming the wire placement, biliary balloon dilators can be used in this setting to dilate sever esophageal strictures successfully. The use of endoscopic biliary accessories in dilating sever esophageal strictures should be considered before sending these patients to invasive retrograde gastroscopy dilation or surgical interventions.

Conclusion

The use of biliary baloon dilators is safe and feasible in managing tight non traversable esophageal strictures (< 6 mm). This technique should be considered before sending all patients for more surgical potion.

Conflict of Interest: None.

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