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Esophageal Atresia Repair in a Premature Infant Complicated By Anastomotic Leak and Stricture: A Case Report

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Abstract

Esophageal atresia (EA) is a rare congenital malformation commonly associated with tracheoesophageal fistula (TEF). Surgical repair in premature infants remains challenging due to fragile tissues and high postoperative complication risks, as highlighted in recent analyses (1, 2).

We report the case of a premature female infant born at 34 weeks' gestation weighing 1.8 kg, diagnosed with Gross type III EA. Primary end-to-end esophagoesophageal anastomosis with distal TEF ligation was performed under moderate tension. On postoperative day 7, an anastomotic leak occurred, which closed spontaneously by day 17. At one month, an anastomotic stricture developed and was successfully treated with five sessions of endoscopic balloon dilatation. The infant showed favorable growth, with a weight of 6.3 kg at six months, full oral feeding, and a normal barium swallow without residual stenosis.

This case highlights the feasibility of conservative management for postoperative complications following EA repair, even in premature infants. Early recognition and endoscopic follow-up are essential to ensure optimal healing and long-term functional outcomes (3, 4, 5).

Keywords: Esophageal atresia; Tracheoesophageal fistula; Premature infant; Anastomotic leak; Esophageal stricture; Endoscopic dilatation.

Introduction

Esophageal atresia (EA) with or without tracheoesophageal fistula (TEF) is one of the most frequent congenital anomalies of the upper digestive tract, with an incidence of 1 per 2,500–4,500 live births (2). The most common type (Gross type III) combines a proximal blind esophagus with a distal TEF (6). Advances in neonatal surgery and intensive care have improved survival to over 95%, but morbidity remains significant (2).

Complications such as anastomotic leaks, strictures, and gastroesophageal reflux disease (GERD) remain frequent, with reported incidences of 10–20%, 30–40%, and up to 50% respectively (2. 4, 7). Long-term morbidity is well documented by Gottrand et al. (3, 4). The risk of stricture increases with anastomotic tension and leakage (8). Endoscopic surveillance is essential to detect early complications and guide dilatation therapy (5).

Case Presentation

A premature female infant born at 34 weeks, weighing 1,800 g, presented with hypersalivation and inability to pass a nasogastric tube. Radiography confirmed EA with distal TEF (Gross type III). Primary repair was performed via right posterolateral thoracotomy. The distal TEF was ligated, and a tensioned end-to-end anastomosis created.

On postoperative day 7, an anastomotic leak was confirmed radiographically. Conservative management—enteral nutrition via gastric tube, antibiotics, chest drain left in place — a spontaneous closure by day 17. At one month, feeding difficulties suggested a stricture which was confirmed by an esophagogastroduodenal transit (figure 1).

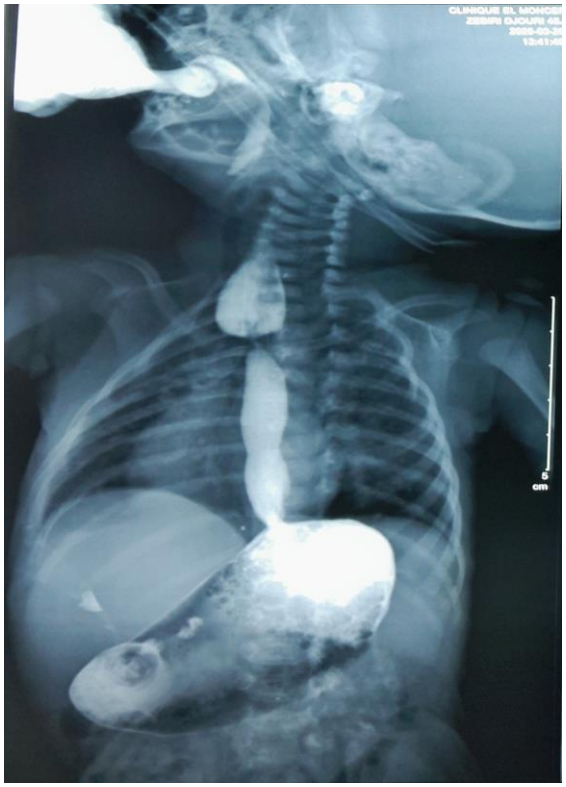

Figure 1: stenosis of the esophageal anastomosis

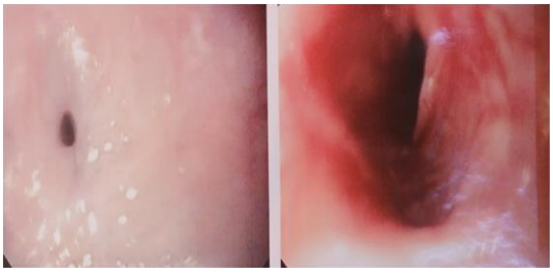

Figure 2: endoscopic image of esophageal stenosis

Endoscopic dilatation was initiated at day 45 (weight 1.6 kg) (figure 2) and repeated every month four times. No complications occurred with a favorable evolution of the stenosis (figure 3).

Figure 3 : favorable evolution of the stenosis

At six months, the infant had normal feeding, weight 6.3 kg, and normal follow-up esophagogastroduodenal transit (figure 4).

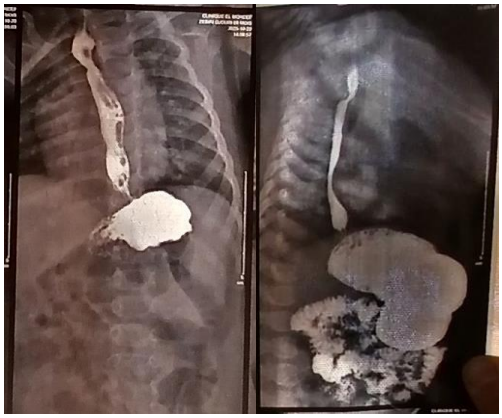

Figure 4: normal oesophago gastroduodenal transit without image of stenosis

Discussion

EA is the most frequent congenital esophageal anomaly and often associated with TEF (6, 9). Prematurity, low birth weight, and long-gap atresia are high-risk factors for postoperative morbidity (2, 7). Long-term follow-up studies (3, 4) confirm persistent digestive and respiratory sequelae in many patients.

Anastomotic leaks and strictures remain major postoperative issues. Michaud et al. reported a 40% incidence of strictures, with anastomotic tension as the strongest risk factor (8). Their work demonstrated high success rates (≈90%) for endoscopic dilatation.

Grandval emphasized that benign esophageal stenoses—including anastomotic strictures—respond well to balloon or Savary-Gilliard dilatations, with perforation rates <0.5% per session (10). Benyoucef et al. described similar success in congenital esophageal stenosis (11).

Systematic endoscopic follow-up is crucial to detect strictures or GERD, as recommended by Sfeir et al. (5). Legrand et al. (7) further detailed management strategies for anastomotic complications, highlighting the importance of individualized treatment.

Conclusion

Postoperative complications such as leaks and strictures can often be managed conservatively, even in premature infants. Endoscopic balloon dilatation remains the gold standard for anastomotic strictures, supported by multiple studies (6, 7, 10, 11). Long-term follow-up is essential to optimize growth and esophageal function (2-5).

Conflicts of interest:

The authors declare no conflict of interest.

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