An 8-year experience of esophageal atresia repair in Sarvar children hospital (Mashhad- IRAN)

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Abstract

Introduction

Background :Esophageal atresia) EA (is a congenital anomaly that is treated by surgical reconstruction . Some early postoperative complications may happen in this filed .we assessed complications following EA repair in a large series of neonates with EA / TEF and in hospital mortality among a large series of our cases.

Materials and methods

243patients with EA / TEF that were treated operatively in Sarvar Children's Hospital from 2002 to 2010 were studied .Early post operative complications in ICU and surgery ward until hospital discharge were assessed.

Results

Mean age was 2.76±3.4 days .Primary repair was performed in %83.5 Mean hospital stay was 12.81±12.5 days .Respiratory problems and food intolerance were most common early complications .In-hospital mortality rate was decreased significantly during last 8 years) from %17.6 to(%4.7

Conclusion

Acceptable results and a growing survival rate was observed in this series of patients and we hope better results with improvements in minimally invasive methods .

Keywords

Esophageal atresia – outcome - In-hospital mortality

Intruduction:

Esophageal atresia (EA) is a congenital anomaly seen in approximately 1 out of 2500 to 4500 live births. [1] Recent improvements in survival of neonates with EA are due to

several factors, including advances in neonatal intensive care and anesthesia as well as improved surgical techniques, parenteral nutrition, and antibiotics [2].

More challenging than the initial surgery is the handling and optimal management of these complications. Some early postoperative complications may set-in such as respiratory failure, or multi-organ failure, anastomosis leakage and mediastinitis, disruption of tracheal fistula and air leak, sepsis and even death. Mismanagement of these complications may increase the risk of long term adverse sequels [3].

In this article we assessed complications following EA repair in a large series of neonates with EA / TEF that were treated at the Sarvar Pediatric Hospital during the last 8 years.

Materials and Methods:

We performed a retrospective review of the records of all patients treated operatively in Sarvar Children's Hospital with a diagnosis of EA over an 8-year period, from 2002 to 2010. Patients underwent an initial evaluation preoperatively, including the degree of prematurity and respiratory and cardiovascular status, presence of major anomalies and a chest radiograph to confirm the diagnosis and assess the presence of TEF. Further preoperative studies such as echocardiogram or renal ultrasound or other specific paraclinical studies were done also. Early postoperative complications in ICU and surgery ward until hospital discharge were. A checklist was designed and demographic data were review according to patient records in NICU. All case with EA that were operated from 2002-2010 were included. Those cases with unproved diagnosis such as four cases with iatrogenic pharyngeal perforation due to probing were excluded.

Statistical analysis was done by SPSS version 11.5 software.

Surgical approach:

Management planning was done according to physiologic status and comorbidities. Esophageal gap was estimated by radiological studies and presence of TEF or preoperative broncoscopy if needed. Operative approach was via a right thoracotomy. If a right-sided aortic arch was detected on preoperative echocardiography, then, a left thoracotomy was done. An extra-pleural approach was preferred expose the EA. The TEF was ligated initially, followed by mobilization of the proximal pouch and subsequent

exposure of the distal esophageal segment. The esophageal ends were then anastomosed in a single layer with a 6-0 polygalactin sutures over a nasogastric tube to achieve esophageal continuity. A thoracic drain was inserted if needed.

Results:

Among 243 patients with EA/TEF treated at Sarvar Children Hospital (a referral academic center) during 2002-2010, 137 were males and 106 cases were females.

Mean age at the operation date was 3.4±2.76 days. Primary repair was performed in 203 patients (83.5%) and other patients underwent different methods of diversion such as gastrostomy and esophagostomy.

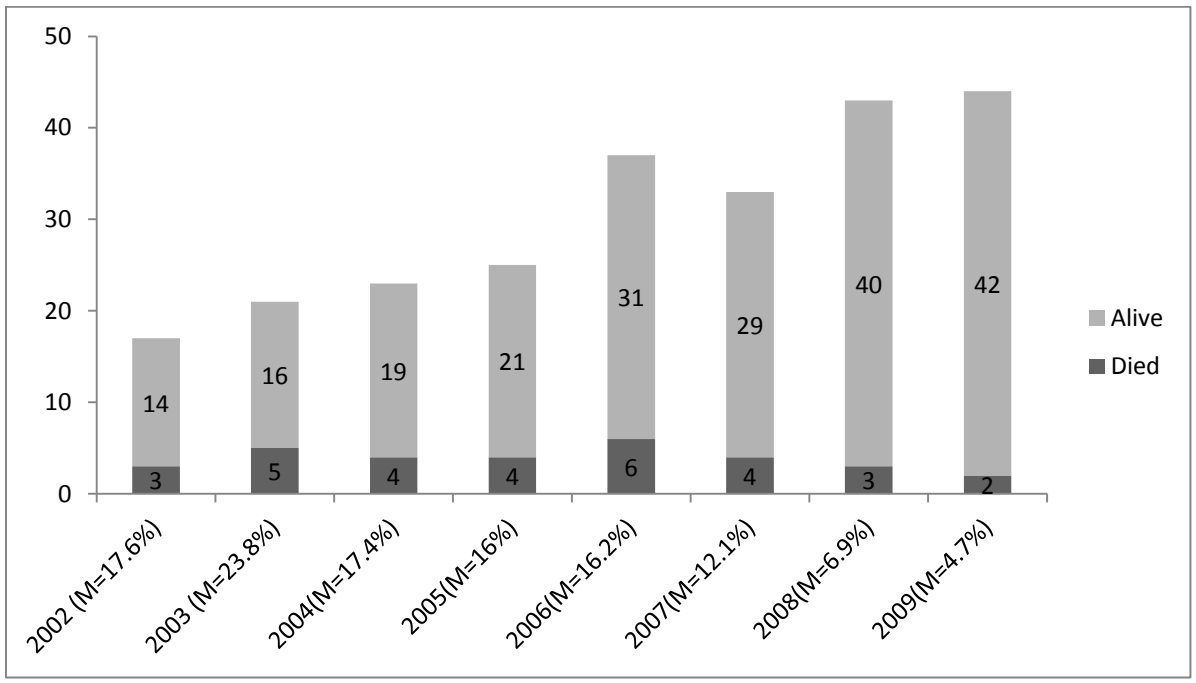
Associated anomalies were detected in 58 patients (23.9%) and there were some patients with several associated anomalies. The most common coexisting anomaly with EA was congenital heart disease that was seen in 31 patients.

Table 1: Demographic characteristics and short term results of patient with EA/TEF at Sarvar Children Hospital

Demographic and follow-up data		Frequency
Male/Female		137/106
Atresia type	EA+distal TEF	213(87.6%)
	EA without TEF	27(11.1%)
	EA+Both proximal & distal TEF	3(1.2%)
Associated anomalies	Cardiovascular	31(12.7%)
	Genitourinary	13(5.3%)
	Gastrointestinal	19(7.8%)
	Central nervous	8(3.2%)
Complications	Anastomosis leakage	35(14.4%)
	Tracheal fistula reopening	3(1.2%)
	Prolonged Respiratory support	6(2.5%)
	Pneumothorax	31(12.7%)
	Food intolerance	11(4.5%)
	Multi-organ failure	27(11.1%)
Deaths		31(12.7%)

Mean hospital stay was 12.5±12.81 days and short term complications were observed in 72 cases (29.6%). Total early mortality rate in the first hospital admission was 12.7%; mainly due to sepsis or respiratory failure and ventilator dependency.

To compare the results of therapeutic interventions over the past years we assessed in hospital mortality rate each year (Fig. 1).



M= In-hospital mortality

Figure 1: In-hospital mortality rate of patients with EA/TEF treated at Sarvar Children's Hospital from 2002 to 2010

Discussion:

Surgical intervention is the mainstay of EA and TEF treatment but depending on the age, physiologic immaturities and coexisting anomalies, operative interventions may have associated complications. The postoperative problems can occur despite favorable anatomy even in a short-gap EA and despite meticulous surgical technique with excellent postoperative management [1].

Early complications may be due to surgical techniques as well as certain patient factors that may aggravate the effect of the surgical technique [4].

These complications include: anastomotic leaks (radiological or incidental, minor leak and major leak), anastomotic stenosis and food intolerance, recurrent TEF or tracheal fistula, pneumothorax and esophageal dysmotility with an associated risk of aspiration [5].

Minor leaks are those that are identified on a routine postoperative contrast study before beginning of oral feeding. This finding is usually not of any significance and can be treated expediently, and most heal completely within a few days [6].

Major leakage (3-5%) is a potentially disastrous consequence and will usually occur early in the postoperative course (within 48-72 hours) and may lead to mediastinitis that may be lethal [7]. Anastomosis leakage (minor and major) was observed in 8.6% of our series.

A recurrent TEF occurs in 3% to 15% of cases and may be much more common following an anastomotic leak, and this may often have result from excessive tension during the anastomosis. [8] Food intolerance and stenosis was observed in 11.1% in our series.

The incidence of other anomalies associated with TEF/EA is reported to be 30-60% [9] these anomalies were also detected in 23% of our cases.

According to a large series experience by Seo et al (2010) the mortality and morbidity rates in treatment of EA/TEF were 24% and 67%, respectively, and the most common cause of death was sepsis [9]. In-hospital mortality was also reported as high as 40% in the early 90’s to less than 5% more recently [9]. Our series also indicated a significant improvement in survival rate during the last years.

This improvement in survival rate was mainly due to improvements in neonatal anesthesiology, better intensive neonatal care, nutritional, other physiological support and meticulous surgical technique.

Recently, EA reconstruction has been done by minimally invasive thoracoscopy at our center in selected cases and with further improvements in this field we hope to gain the better short term and long term results.

Conclusion: Acceptable results and a growing survival rate were observed in this series of patients and we hope for better results with improvements in minimally invasive methods.

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