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
243 patients 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 3.4±2.76 days. Primary repair was performed in 83.5% Mean hospital stay was 12.5±12.81 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

Introduction
Esophageal atresia(EA) is a congenital anomaly that may see in approximately 1 out of 2500 to 4500 live births.[1]

Recent improvements in survival of neonates with EA is due to several factors, including advances in neonatal intensive care and anesthesia as well as improved surgical techniques, parentral nutrition, and antibiotics.[2]

More challenging than the initial surgery is the handling and optimal management of these complications. Some early postoperative complications may happen 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 in Sarvar pediatric hospital during 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 a 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 studies such as echocardiogram or renal ultrasound or other paraclinical studies were done just in case. Early post operative complications in ICU and

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surgery ward until hospital discharge were also assessed.

Surgical approach:

Management planning was done according to physiologic status and comorbidities and esophageal gap that 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. extra-pleural approach was preferred method to 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 vicryl sutures over a nasogasteric tube to achieve esophageal continuity. Thoracic drain was inserted if needed.

Results:

Among total 243 patients with EA/TEF that were treated in Sarvar children hospital (a referral academic center) during last 8 years, 137 cases were male and 106 cases were female.

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%). The most common coexisting anomaly with EA was congenital heart disease that was

Table 1. Short term complications of patient with EA/TEF in Sarvar children hospital

Complication	Frequency	Percent
Major anastomosis leakage	21	8.6
tracheal fistula leakage	3	1.2
Prolonged Respiratory support	35	14.4
Multi organ failure	6	2.5
Food intolerance	27	11.1
Pneomothorax	11	4.5
Death(mainly due to sepsis)	31	12.7

To compare the results of therapeutic interventions over last years we assessed in hospital mortality rate in each year that is shown in figure1.

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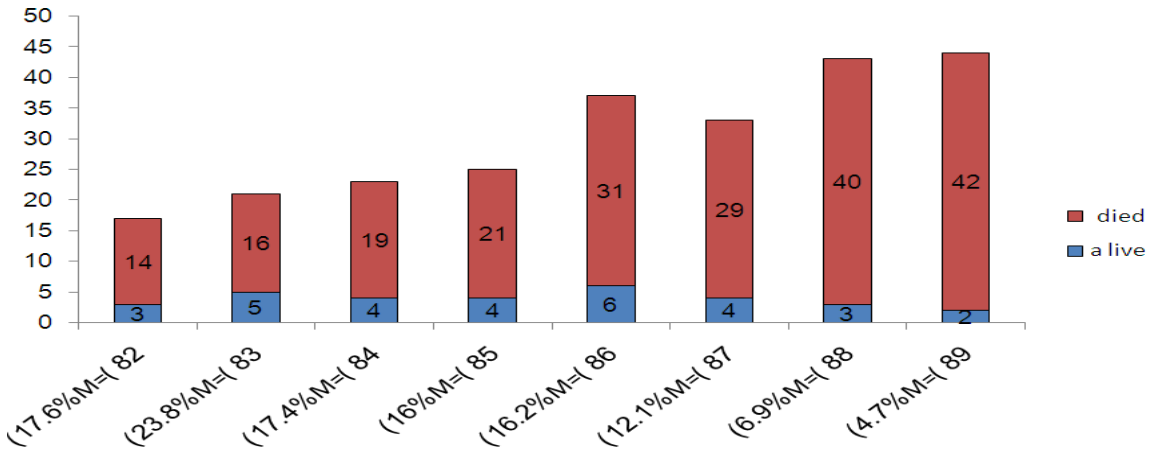
Figure 1. In hospital mortality rate of patients with EA/TEF in Sarvar children hospital.



M= In hospital morality

seen in 31 patients. We should mention that some of patients that were healthy in primary evaluation and physical exams were worked up for other anomalies after discharge so the rate of simultaneous anomalies may be underestimated. Mean hospital stay was 12.5±12.81 days and short term complications are shown in table 1.

Discussion:

Surgical intervention is the mainstay of EA and TEF treatment but according to the age ,physiologic immaturities and coexisting anomalies, operative interventions may have several known complications. These postoperative problems can occur despite the 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 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 and pneumothrax 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 feeds. This finding is usually not of any significance and can be treated expectantly, and mostly healing completed within a few days.[6] major leak (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 resulted from excessive tension during the anastomosis.[8] food intolerance and stenosis was observed in 11.1% among 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 early 90th to less than 5% recently.[9] Our series also indicated a significant improvement in survival rate during last years. Growing number of patients was due to better presentation of our hospital as a referral center in the east of IRAN.

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

Recently, EA reconstruction is done by minimally invasive method by thoracoscopy in our center in selected cases and with further improvements in this filed we hope to gain the best short term and long term results.

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