Perioperative Outcomes in Neonates with Esophageal Atresia with or without Tracheoesophageal Fistula

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Objective: *To evaluate the perioperative outcomes in neonates undergoing surgical repair of esophageal atresia with or without tracheoesophageal fistula (EA/TEF) and to determine the associated factors contributing to prolonged postoperative hospital length of stay (LOS) and death.*
Material and Method: *The medical records of neonates diagnosed with EA/TEF who underwent surgical repairs from January 2004 to December 2013 were retrospectively analyzed.*
Results: *Forty-nine patients were enrolled. Esophageal stricture, anastomotic leakage, postoperative pneumonia and atelectasis were 25.0%, 6.3%, 27.1% and 6.3% respectively. Prematurity was the single significant risk factor for prolonged postoperative hospital LOS using a multiple logistic regression analysis (OR 5.55, 95% CI 1.11 to 27.73, p = 0.04). Low body weight (p = 0.03), cyanotic heart disease (OR 205.00, 95% CI 11.02 to 3,813.02, p<0.01) and pre-existing endotracheal tube (OR 14.09, 95% CI 1.48 to 134.30, p = 0.021) were potential risk factors for increasing mortality according to a univariate analysis. Consequently, there were 6 mortality cases (12.2%), mostly from pneumonia and sepsis.*
Conclusion: *Postoperative esophageal stricture and pneumonia in neonates undergoing EA/TEF repair were common. Prematurity was a predictor for prolonged postoperative hospital LOS. Mortality rate increased in patients with low body weight, pre-existing endotracheal tube and cyanotic heart disease.*

Keywords: *Esophageal atresia,Tracheoesophageal fistula, Neonate, Perioperative outcomes*

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Esophageal atresia (EA) with or without tracheoesophageal fistula (TEF) are the most common congenital abnormalities of the esophagus. The overall incidence of EA/TEF is approximately 1 in every 2,500 to 4,000 live births[1,2]. The mortality rate of neonates with EA/TEF has greatly declined from 31.6% in 1960 to 9.2% in 1997[3]. Observed rates have even decreased to 5.4% in a report of a large cohort study from 43 children's hospital in the United States from 1999 to 2012[4]. Surgical treatment is certainly the mainstay in reduction of mortality; nevertheless, the advancement in perioperative care is of great importance. Improvements in neonatal anesthesia, neonatal intensive care, respiratory care, nutritional support, and antibiotic therapy have shown to be substantial components contributing to a significant decline in the mortality rate. However, the mortality remains persistently high in cases of prematurity and severe co-existing anomalies[5,6].

The perioperative course of neonates with EA/TEF is complicated by several components including the abnormality of the esophagus itself, associated comorbidities, surgical techniques, anesthetic management and postoperative complications. These factors put the patient at risk for prolonged intensive care unit (ICU) and hospital length of stay (LOS), and most importantly death.

There is no up-to-date data available regarding the outcomes and risk factors for prolonged postoperative hospital LOS and death of Asian neonates with EA/TEF who have undergone surgical repair. Therefore, this study aimed to retrospectively evaluate the perioperative outcomes in neonates that have undergone surgical repair of EA with or without TEF and to determine the associated factors that contributed to prolonged postoperative hospital LOS and death.

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Material and Method

This retrospective cohort study was approved by the Institutional Review Board (Si 033/2013). The medical records of patients who were diagnosed with EA/TEF and underwent their first surgical repair from January 2004 to December 2013 were reviewed.

Data were collected and analyzed for baseline demographic data, intraoperative anesthetic and surgical management, intraoperative adverse events, and postoperative outcomes during the index admission. Perioperative variables, considered as possible risk factors for a prolonged postoperative hospital LOS and death, namely gestational age, birth weight, classification of newborn size, age and weight at the time of surgery, chromosomal abnormalities, cyanotic heart disease, preoperative aspiration pneumonia, pre-existing endotracheal tube and esophageal gap length, were documented.

Newborn size was classified into small-, appropriate- or large-for-gestational age (SGA, AGA or LGA). Birth weight below the 10th percentile, between the 10th to 90th percentile and over the 90th percentile was defined as SGA, AGA and LGA respectively[7].

The anatomical types of EA/TEF were based on the Gross classification[8]: pure EA (type A), EA with proximal TEF (type B), EA with distal TEF (type C), EA with both proximal and distal TEF (type D), and TEF without EA (type E). Long esophageal gap was defined as a length between esophageal pouches exceeding two vertebral bodies or more than 3 centimeters[9].

Regarding the diagnosis of VACTERL association, the definition of each abnormality was established from the reviewed literature[10]. Vertebral defects were limited to bony vertebral anomalies and spinal dysraphisms. Anorectal malformation included atresia of the rectum but no other part of the intestine. Cardiac anomalies did not include patent ductus arteriosus (PDA) and patent foramen ovale (PFO). Renal defects were limited to renal and internal renal anomalies. Limb defects consisted of upper and lower extremity reduction deformities including polydactyly and syndactyly.

The critical events included desaturation, hypotension, hypothermia and hemodynamic instability. Each event was defined as follows: 1) Desaturation: a peripheral hemoglobin-oxygen saturation (SpO_2) of less than 90% or a decrease of more than 10% from baseline oxygen saturation, 2) Hypotension: a reduction in systolic blood pressure more than 20% from baseline value, 3) Hypothermia: a core temperature of less than 35 degrees Celsius, 4) Hemodynamic instability: severe hypotension that requires inotropic support or cardiopulmonary resuscitation (CPR).

Postoperative hospital LOS was the time between the day of surgery until hospital discharge or death. Prolonged postoperative hospital LOS was defined as a postoperative hospital LOS of greater than or equal to the 75th percentile for the hospital LOS of the study group[11].

Statistical analysis

Demographic data were analyzed using descriptive statistics, i.e. number (%), mean (SD), median (min, max), as appropriate. In order to identify the potential factors associated with prolonged postoperative hospital LOS, univariate analysis with a binary logistic regression was first performed to possible factors related to postoperative hospital LOS. Factors with $p<0.05$ were then included in a multivariate analysis. Regarding the factors affecting death, only a univariate analysis was carried out due to an infrequent incidence of death. The *p*-value of less than 0.05 was considered statistically significant. All statistical data analyses were performed using PASW Statistics for Windows, version 18.0 Chicago: SPSS, Inc.

Results

Forty-nine neonates who were diagnosed with EA with or without TEF and underwent their first surgical repair at our hospital were included in this study. Patient characteristics, intraoperative data and postoperative complications have been presented in Table 1 and 2.

Half of the patients had low birth weight (birth weight less than 2,500 g) and about 30% were born prematurely. The median age was 1 day on the day of surgery. There was one distinct outlier who was twenty-three days old at the time of operation. This delay in surgery was a result of a late diagnosis of EA/TEF. This patient presented with aspiration pneumonia and was transferred in from another hospital. About 60% of the patients had one or more additional anomaly related to VACTERL association; among these comorbidities, cardiac a nomaly was the most common prevalent (42.9%). Seventeen patients (34.7%) required preoperative endotracheal intubation. The most common cause of preoperative endotracheal intubation was respiratory failure due to aspiration pneumonia, followed by cardiac failure. However, the indications were not well documented in every case.

Table 1. Patient characteristics and intraoperative data

Variables	(n = 49)
Gender: male	36 (73.5)
Gestational age (wk)	37±2.7
Birth weight (kg)	2.5±0.6
Birth size assessment	
SGA	22 (44.9)
<3rd percentile	11 (22.4)
3rd to 10th percentile	11 (22.4)
AGA	27 (55.1)
Age (d)	1 (1, 23)
Body weight (kg)	2.5±0.7
Type of esophageal atresia	
C	47 (96.0)
D	1 (2.0)
E	1 (2.0)
VACTERL association	30 (61.2)
Vertebral defects	7 (14.3)
Anorectal malformation	9 (18.4)
Cardiac anomalies	21 (42.9)
Cyanotic	7 (14.3)
Non-cyanotic	14 (28.6)
Renal abnormalities	3 (6.1)
Limb defects	2 (4.1)
Chromosomal abnormalities	
Trisomy 18	2 (4.1)
Trisomy 21	3 (6.1)
Preoperative problem	
Aspiration pneumonia	15 (30.6)
Pre-existing endotracheal intubation	17 (34.7)
Anesthetic management	
Induction technique (n = 32)	
Inhalation induction	15 (46.9)
Intravenous induction	15 (46.9)
Awake	2 (6.2)
Intubation technique (n = 32)	
Spontaneous breathing	16 (50.0)
Use of muscle relaxant	16 (50.0)
Extubation in operating room	1 (2.0)
Intraoperative problems	
Desaturation	4 (8.2)
Hypotension	3 (6.1)
Cardiac arrest	0
Operation	
Esophagoesophagostomy with TEF division	45 (91.9)
Gastrostomy with TEF division	2 (4.1)
Gastrostomy with cervical esophagostomy and TEF division	1 (2.0)
Isolated TEF division	1 (2.0)
Operation time (min)	205 (120, 425)
Esophageal gap (n = 48)	
Short gap	39 (81.3)
Long gap	9 (18.7)

Data presented as mean ± SD, median (min, max) or number (%).
AGA = appropriate-for-gestational age; SGA = small-for-gestational age

Table 2. Postoperative outcomes

Variables	(n = 48)
Death	6 (12.2)
Cardiac arrest	1 (2.1)
Anastomotic leakage	3 (6.3)
Esophageal stricture	12 (25.0)
Surgical wound infection	4 (8.3)
Pneumonia	13 (27.1)
Lung atelectasis	3 (6.3)
Congestive heart failure	4 (8.3)
Renal failure	2 (4.2)
Ventilator time (d)	2 (1, 24)
Length of stay (d)	
Total hospital admission	21.5 (7, 99)
Intensive care unit	13.0 (6, 59)
Postoperative	18.5 (7, 99)

Data presented as number (%) or median (min, max)

General anesthesia was administered to all patients. Inhalation and intravenous induction techniques were performed in a similar proportion. Anesthesia was induced with inhalational anesthetic agents for the patients who had already been intubated. Endotracheal tubes were inserted during the maintenance of spontaneous ventilation or after the administration of a neuromuscular blocking drug. Awake intubation was performed in two cases. One patient was extubated at the conclusion of the surgery. Although the reason for the extubation was not clarified, the postoperative course was uneventful. Desaturation was found in four patients (8.2%). One episode of desaturation occurred during lung retraction -somehow the causes were not detailed in the other episodes. Three patients (6.1%) had hypotension, two were from hypovolemia and one was a result of heart compression from the surgical retractor. Most of the

patients had their TEF division and repaired during the first procedure; additional operations were performed depending on the anatomical type and the esophageal gap length.

One patient, with comorbid trisomy 18 and major cardiac anomaly, developed cardiac arrest on the third postoperative day.The parents withheld any further treatment and requested for palliative care at the primary hospital. Therefore, this patient was excluded from the postoperative outcomes and risk factors analyses.

The overall mortality was 12.2% (6 patients). Detailed characteristics of patients who died have been presented in Table 3. Sepsis due to pneumonia was the most common cause of in-hospital death, followed by congestive heart failure. Esophageal stricture and pneumonia were frequent postoperative complications after surgical repair. Median ICU and postoperative hospital LOS were 13 and 18.5 days, respectively. Prolonged postoperative hospital LOS was observed in eleven patients (22.9%). The possible risk factors associated with prolonged postoperative hospital LOS and death have been provided in Table 4 and 5 respectively. Prematurity was a significant risk factor for prolonged postoperative hospital LOS using the multivariate analysis (OR 5.55, 95% CI 1.11 to 27.73, p = 0.04). According to the univariate analysis, potential risk factors for mortality included low body weight (p = 0.03), cyanotic heart disease (OR 205.00, 95% CI 11.02 to 3813.02, p<0.01), and pre-existing endotracheal tube (OR 14.09, 95% CI 1.48 to 134.30, p = 0.02).

Discussion

EA/TEF is a rare congenital anomaly. Only a small number of cases could be recruited, even from a tertiary university hospital during a 10-year study period. The patient characteristics in this series were comparable to prior studies[3,12-14] with regard to gestational age, birth weight, anatomical types of EA/TEF, co-existing anomalies, and chromosomal abnormalities.

EA/TEF type C is generally the most common type, followed by type A at approximately 83% and 8% respectively[12], while other types of EA/TEF are much less frequent. However, the incidence of type A EA in this study was unexpectedly very low. It could be that the patients with type A underwent the first operations at other hospitals prior to referral and were not recruited in this study.

Esophageal stricture and pneumonia were the two distinct outcomes after surgical repair of EA/TEF in this study. The incidence of esophageal stricture was 35 to 45% in other publications[15-17], which was quite high compared to this study. It might be that the authors selectively collected outcomes only during the index hospital admission. The interval between surgical treatment and the first diagnosis of anastomotic stricture can be as long as 30 to 600 days[15], so the numbers from the present study could be underestimated. There were several predisposing factors for the development of esophageal stricture including anastomotic tension, anastomotic leakage, gastroesophageal reflux andsuture material. Asole independent risk factor for esophageal stricture in the Serhal et al study was anastomotic tension, which was strongly correlated with esophageal gap length[15]. There was also a notable relationship between gap length and formation of esophageal stricture reported in the Brown and Tam's study[16]. Furthermore, long gap length was shown to be associated with increased morbidity and mortality in previous literatures[17,18]. In contrast, this study could not demonstrate the correlation between long gap length and prolonged postoperative hospital LOS or death. This discrepancy could be explained by dissimilar methodologies and the definitions of long gap length between studies. Additionally, the number of deceased patients in this study was too small to elucidate the significance of the gap length.

Pneumonia in neonates with EA/TEF can occur at any time from preoperative to postoperative period. Preoperative aspiration pneumonia may occur as a consequence of excessive salivation, secretion, oral feeding or the associated TEF. Early diagnosis is, therefore, mandatory in order to prevent aspiration pneumonia. Examination with nasogastric tube insertion is utilized in every symptomatic newborn suspected of EA/TEF in the authors' hospital; this allows early recognition and immediate surgical treatment. However, aspiration pneumonia still occurred in one third of the neonates and half of them required mechanical ventilatory support because of respiratory failure. Compared to other studies with occurrences of preoperative pneumonia of only 8 to 20%, the incidence of aspiration pneumonia in this study was slightly higher[6,19]. A delay in the operative treatment could be a possible precipitating reason for the prevalence of aspiration pneumonia, even though an early diagnosis could be achieved. There were other factors that may contribute to a delay in surgery, such asthe presence of other comorbidities, hemodynamic instability, or the patients' referral from another hospital.

Table 3. Detailed characteristics of dead patients

	1	2	3	4	5	6
Sex	Male	Female	Female	Female	Male	Female
Age (d)	1	2	3	4	5	6
Gestational age (week)	35	35	38	37	38	34
Weight (g)	1,700	1,850	1,680	2,200	2,500	1,880
Apgar (1 min, 5 min)	6, 7	8, 9	6, 10	9, 10	6, 6	9, 10
VACTERL	C	V, A, C	C	C	C, L	C
Cardiac anomaly	PA, VSD	TOF, ASD, PDA	Common ventricle, ASD, PDA, PS, PR	ASD, VSD, PDA	HLHS	PA, VSD
Other congenital anomalies	Duodenal atresia	Agenesis of corpus collosum, cleft lip, cleft palate	-	-	Omphalocele, liver herniation	-
Chromosomal abnormality	-	-	Trisomy 18	-	-	Trisomy 21
Aspiration pneumonia	N	Y	N	N	N	N
Pre-existing ETT	Y	Y	Y	Y	Y	Y
Preoperative inotrope	N	N	N	Y	Y	Y
Esophageal gap (cm)	1.5	1	0.3	-	3	3
Cause of death	Pneumonia with sepsis	Unknown	Congestive heart failure	HAP with sepsis	Sepsis	Pneumonia with sepsis
Number of day from surgery to death	35	56	48	21	23	29

ASD = atrial septal defect; HAP = hospital-acquired pneumonia; HLHS = hypoplastic left heart syndrome; PA = pulmonary atresia; PDA = patent ductus arteriosus; PR = pulmonic regurgitation; PS = pulmonic stenosis; TOF = tetralogy of Fallot; VACTERL = vertebral, anal, cardiac, tracheoesophageal fistula, renal, limb abnormalities; VSD = ventricular septal defect

Table 4. Factors associated with prolonged hospital length of stay (>29 days) of 48 patients

	Length of stay		Univariate analysis		Multivariate analysis	
	>29 days (n = 11)	≤29 days (n = 37)	Crude OR (95% CI)	*p*-value	Adjusted OR (95% CI)	*p*-value
GA (wk)						
<37	7 (43.8)	16 (72.7)	5.44 (1.29-22.98)	0.02	5.55 (1.11-27.73)	0.04
≥37	4 (12.5)	21 (80.8)	1		1	
Birth weight (g)						
≤2,500	7 (26.9)	19 (73.1)	1.66 (0.41-6.64)	0.48		
>2,500	4 (18.2)	18 (81.8)	1			
Classification of newborn size						
SGA	6 (27.3)	16 (72.7)	1.58 (0.41-6.10)	0.51		
AGA	5 (19.2)	21 (80.8)	1			
Age (days)						
≤1	2 (9.1)	20 (90.9)	0.19 (0.04-0.99)	0.05	0.23 (0.04-1.49)	0.12
>1	9 (34.6)	18 (81.8)	1		1	
Weight (g)						
≤2,500	8 (28.6)	20 (71.4)	2.27 (0.52-9.92)	0.28		
>2,500	3 (15.0)	17 (85.0)	1			
Chromosome abnormality						
Y	1 (25.0)	3 (75.0)	1.13 (0.12-12.13)	0.92		
N	10 (47.7)	34 (77.3)	1			
Cyanotic heart disease						
Y	3 (50.0)	3 (50.0)	4.25 (0.72-25.10)	0.11		
N	8 (19.0)	34 (81.0)	1			
Preoperative aspiration pneumonia						
Y	4 (26.7)	11 (73.3)	1.35 (0.33-5.57)	0.68		
N	7 (21.2)	26 (78.8)	1			
Pre-existing ETT						
Y	4 (12.5)	28 (87.5)	5.44 (1.29-22.98)	0.02	3.40 (0.67-17.34)	0.14
N	7 (43.8)	9 (56.2)	1		1	
Esophageal gap						
Long	1 (12.5)	7 (87.5)	0.410 (0.05-3.80)	0.44		
Short	10 (25.6)	29 (74.4)	1			

AGA = appropriate-for-gestational age; ETT = endotracheal tube; GA = gestational age; SGA = small-for-gestational age

Postoperative pneumonia was the cause of death in three patients. Pneumonia could be the consequence of several insults, for example, a sequel a from preoperative aspiration pneumonia, the induction of anesthesia, surgery that involves thoracotomy and one-lung ventilation, ventilator or hospital-acquired pneumonia due to prolonged mechanical ventilation.

The incidence of death was not much different from recent published literatures[4,19-21]. Surgical-technique complications were the leading cause of death from 1947 to 1968[19], but in contemporary time, the associated congenital malformation has become the most important cause of death, accounting for 78% of the mortality[19]. Most of the deceased patients in this study had low body weightwith comorbid major cardiac diseases and were preoperatively intubated. The analysis of factors contributing to death in this study suggested that low body weight, cyanotic heart disease, and preoperative endotracheal intubation demonstrated a higher tendency towards increasing mortality. This finding corresponded with the Sulkowski et al study, in which they reported low birth weight, cyanotic heart disease, preoperative mechanical ventilation and other congenital abnormalities as predictors of in-hospital death after surgical repair of EA/TEF[4]. Cardiac anomaly was also identified as a

Table 5. Factors associated with death of 48 patients

	Dead (n = 6)	Alive (n = 42)	Univariate analysis	
			Crude OR (95% CI)	*p*-value
GA (wk)				
<37	3 (18.8)	13 (81.2)	2.23 (0.40 to 12.57)	0.36
≥37	3 (9.4)	29 (90.6)	1	
Birth weight (g)				
≥2,500	5 (19.2)	21 (80.8)	5.00 (0.54 to 46.53)	0.16
>2,500	1 (4.5)	21 (95.5)	1	
Age (days)				
≤1	1 (4.5)	21 (95.5)	0.20 (0.02 to 1.86)	0.16
>1	5 (19.2)	21 (80.8)	1	
Classification of newborn size				
SGA	3 (13.6)	19 (86.4)	1.21 (0.22 to 6.71)	0.83
AGA	3 (11.5)	23 (88.5)	1	
Weight (g)				
≤2,500	6 (21.4)	22 (78.6)	-	0.03
>2,500	0 (0)	20 (100)		
Chromosome abnormality				
Y	1 (25.0)	3 (75.0)	2.60 (0.23 to 30.05)	0.44
N	5 (11.4)	39 (88.6)	1	
Cyanotic heart disease				
Y	5 (83.3)	1 (16.7)	205.00 (11.02 to 3,813.02)	0.01
N	1 (2.4)	41 (97.6)	1	
Preoperative aspiration pneumonia				
Y	1 (6.7)	14 (93.3)	0.40 (0.04 to 3.76)	0.42
N	5 (15.2)	28 (84.8)	1	
Pre-existing ETT				
Y	5 (31.2)	11 (68.8)	14.09 (1.48 to 134.30)	0.02
N	1 (3.1)	31 (96.9)	1	
Esophageal gap				
Long	2 (25.0)	6 (75.0)	4.00 (0.55 to 29.17)	0.17
Short	3 (7.7)	36 (92.3)	1	

AGA = appropriate-for-gestational age; ETT = endotracheal tube; GA = gestational age; SGA = small-for-gestational age

significant prognostic factor for mortality in several publications[22,23]. With the limitation in the rarity of mortality cases, the authors were unable to calculate the risk factor for death using multivariate analysis.

Shetty et al collected LOS data in the patients with isolated esophageal atresia who underwent primary repair from 2006 to 2011 at university hospitals in the United Kingdom[24]. They reported a median total hospital LOS of 33 days with a maximum of 133 days and a median ICU LOS of 25 days with a maximum of 123 days. No mortality was detected. Compared to this study, the LOS of both ICU and hospital were obviously lower. However, the patient characteristics were not described in their study, so the authors were unable to reconcile the disparity of the results.

To date, there are limited data related to the risk factors for prolonged postoperative hospital LOS after EA/TEF surgery. Prematurity was the only significant predictor for prolonged postoperative hospital LOS found in this study. Currently, prematurity is apparently not associated with mortality as a result of the evolution in the neonatal intensive care, anesthesia, and surgical expertise. Nevertheless, the preterm newborns are well recognized for their susceptibility to specific complications related to prematurity, such as necrotizing enterocolitis, intraventricular hemorrhage and chronic lung diseases, which can significantly extend the duration of hospital admission. A study by Russell et al revealed that the average hospitalization of preterm newborns was 12.9

days compared to 2.9 days in the uncomplicated births. For extremely preterm neonates with less than 28 weeks' gestation, the mean hospital LOS was as high as 42 days[25].

This study was limited by the nature of retrospective design and the small number of patients recruited, owing to the rare incidence of the disease. Anesthetic data could only be retrieved from anesthetic records in which some data might be underestimated. For example, intraoperative desaturation was documented but the causes of these events were not clearly described. Ventilatory difficulties, which are frequently experienced during the induction and maintenance of anesthesia, were not detected in this study. A multi-center study is recommended to increase the number of the study population in order to extrapolate the clinical relevant complications and risk factors.

We selectively recorded the postoperative complications during the index hospital admission but not late complications such as gastroesophageal reflux, recurrent fistula, stricture and dysmotility. In addition, for patients who had esophageal stricture and needed to have repeated episodes of esophageal dilatation under general anesthesia, their behavioral and neurocognitive functions should be further investigated.

Conclusion

Postoperative esophageal stricture and pneumonia in neonates undergoing EA/TEF repair were common. Recognition and avoidance of the risk factors, including early detection of these complications, should prevent the forth coming morbidity and mortality. Prematurity in concurrence with EA/TEF complicated by associated abnormalities, particularly cyanotic heart disease, and the impact of thoracotomy surgery can further deteriorate the fragile neonates. Carefully weighing risks and benefits of surgical repair in these patients should be of concern. Acquaintance with postoperative complications is also important. Low body weight, pre-existing endotracheal tube, and cyanotic heart disease are associated with increased mortality odds. In this study, mortality was predominately caused by pulmonary complications. Therefore, the occurrence of pneumonia, either from preoperative aspiration or postoperatively developed, should be vigilantly prevented.

What is already knowon this topic?

Esophageal atresia with or without tracheo-esophageal fistula are associated with other comorbidities. Surgery is the mainstay of the treatment. Mortality rate has been decreased over decades.

What this study adds?

Perioperative outcomes in anesthesia and surgical aspects including predictors of prolonged hospital length of stay and mortality.

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Potential conflicts of interest

None.

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ผลลัพธ์ของการผ่าตัดทารกแรกเกิดที่มารับการผ่าตัดแก้ไขโรคหลอดอาหารอุดตันแต่กำเนิดที่มีหรือไม่มีทางเชื่อมกับหลอดลม

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วัตถุประสงค์: เพื่อศึกษาผลลัพธ์ของการผ่าตัดในทารกแรกเกิดที่เข้ารับการผ่าตัดแก้ไขโรคหลอดอาหาร อุดตันแต่กำเนิดที่มีหรือไม่มีทางเชื่อมกับหลอดลม และปัจจัยเสี่ยงที่ทำให้ผู้ป่วยนอนโรงพยาบาลนานหรือเสียชีวิต

วัสดุและวิธีการ: เป็นการศึกษาย้อนหลังในผู้ป่วยอายุน้อยกว่า 1 เดือนที่เข้ารับการผ่าตัดแก้ไขโรคหลอดอาหาอุดตัน แต่กำเนิดที่มีหรือไม่มีทางเชื่อมกับหลอดลมระหว่างเดือนมกราคม พ.ศ. 2547 ถึงเดือนธันวาคม พ.ศ. 2556

ผลการศึกษา: จากประชากรศึกษาทั้งหมด 49 ราย ภาวะแทรกซ้อนหลังผ่าตัดที่พบได้บ่อย ได้แก่ หลอดอาหารตีบ (ร้อยละ 25) การรั่วของรอยต่อบริเวณผ่าตัด (ร้อยละ 6.3) ปอดติดเชื้อหลังผ่าตัด (ร้อยละ 27.1) และถุงลมปอดแฟบ (ร้อยละ 6.3) ผู้ป่วยเสียชีวิตจำนวน 6 ราย (ร้อยละ 12.2) สาเหตุการตายส่วนใหญ่เกิดจากภาวะติดเชื้อในกระแสเลือด และปอดติดเชื้อจาก multivariate analysis พบภาวะคลอดก่อนกำหนดเป็นปัจจัยเสี่ยงต่อการนอนโรงพยาบาลนานมากกว่า 21 วัน (OR 5.55, 95% CI 1.11 ถึง 27.73, p = 0.04) univariate analysis พบว่าปัจจัยที่มีความสัมพันธ์ต่ออัตราเสียชีวิตที่เพิ่มขึ้น ได้แก่ ผู้ป่วยน้ำหนักตัวน้อย (p = 0.03) มีโรคหัวใจแต่กำเนิดชนิดเขียว (OR 205.00, 95% CI 11.02 ถึง 3,813.02, p<0.01) และผู้ป่วยที่ได้รับการใส่ท่อหายใจตั้งแต่ก่อนผ่าตัด (OR 14.09, 95% CI 1.48 ถึง 134.30, p = 0.02)

สรุป: หลอดอาหารตีบและปอดติดเชื้อหลังผ่าตัดเป็นภาวะแทรกซ้อนที่พบได้บ่อยตามหลังการผ่าตัดแก้ไข โรคหลอดอาหาร อุดตันแต่กำเนิดที่มีหรือไม่มีทางเชื่อมกับหลอดลม ภาวะคลอดก่อนกำหนดเพิ่มความเสี่ยงต่อการนอน โรงพยาบาลนาน ขณะที่ผู้ป่วยที่มีน้ำหนักตัวน้อย มีโรคหัวใจแต่กำเนิดชนิดเขียว และได้รับการใส่ท่อหายใจ ตั้งแต่ก่อนผ่าตัด มีความสัมพันธ์กับอัตราเสียชีวิตที่เพิ่มขึ้น