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Original Article

Tracheostomy Experiences in 37 Children during 12 Years: A Retrospective Study

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ABSTRACT

Objective: The most important indication for tracheotomy in children is long-term intubation due to cardiopulmonary and neurological diseases. Pediatric tracheostomy is associated with varying complication (10–58%) and mortality (0–3.6%) rates. Herein, we aimed to present the results of our 12 years of pediatric tracheostomy experience.

Methods: This was a retrospective study of medical records of pediatric patients who underwent tracheostomy in our pediatric surgery department from 2009 to 2021.

Results: During 12 years, 37 tracheostomies were performed in 17 (45.9%) males and 20 (54.1%) female children, and the median age was 5 months (min: 2 months–14 years). Emergency tracheostomy was performed in 8 (21.6%), while planned tracheostomy in 29 (78.4%). During the operation and early postoperative days, any medical problem was detected in 34 (91.9%) patients, while 2 (5.4%) neonates with tracheal atresia were lost in the first and second postoperative days. One patient was desaturated (2.7%) due to decannulation during the tracheostomy dressing; however, tracheostomy cannula was safely inserted again after intratracheal intubation. Two cannulas were removed; granulation tissue was formed in 1 case, and occlusion of the cannula was observed in 2 cases (one on the post-operative 2nd day, and the second one on the post-operative 10th day) as complications of tracheostomy. Twenty-three patients (62.2%) survived, and 14 (37.8%) patients died. Among the surviving patients, two tracheostomies were closed in a boy (with congenital diaphragmatic hernia), and in a girl (with esophageal atresia, distal tracheoesophageal fistula, severe tracheomalacia, and Fallot tetralogy), 3 years postoperatively.

Conclusion: Pediatric tracheotomy can be successfully performed with minimal complication rates through appropriate surgical technique and adequate postoperative care.

INTRODUCTION

Tracheostomy is one of the most common surgical procedures in children hospitalized in the intensive care unit.[1] In pediatric tracheostomies, it is aimed to create a safe airway, optimize ventilation, and shorten the hospital discharge time.[2] The most important indication for tracheotomy in children is long-term intubation due to cardiopulmonary and neurological diseases.[2] The complication rate of pediatric tracheostomy is higher than in adults.[3] Mortality estimates are also variable in children due to the comorbidities of tracheostomy.[3,4] The process of making the indication of pediatric tracheotomy and subsequent decannulation is a challenging issue that should be evaluated in combination.[5]

Here, we aimed to discuss our experiences with pediatric tracheostomy, which is one of the most important urgent issues in neonatal and pediatric intensive care units.

MATERIALS AND METHODS

This study was conducted in accordance with the Helsinki Declaration and approval of The Ethics Committee of Our Hospital dated September 22, 2021, numbered 157. All medical records of the children who underwent tracheostomy in our department between 2009 and 2021 were analyzed retrospectively.

All medical records of the patients were collected from hospital archives, in terms of age, gender of the patients, respiratory insufficiency, diagnoses, additional anomalies, history of surgery, gestational weeks at birth, birth weight, preoperative intubation times, emergency/planned tracheostomy, concomitant surgery(ies), total hospitalization time calculated as the sum of preoperative duration of hospitalization and hospital stay until the postoperative discharge, the presence, distribution of postoperative complications, the status of survival/exitus, and the closure of the tracheostomy in the follow-ups.

Patient groups were developed based on the indication for tracheostomy: pulmonary, anatomic/airway obstruction, and neurologic. Patients were categorized into three groups by all independent authors based on their primary indication for tracheostomy: (1) pulmonary, (2) anatomic/airway obstruction, and (3) neurologic causes. When a patient had more than one indication for tracheostomy (e.g., bronchopulmonary dysplasia (BPD) and anatomic/airway obstruction), all independent authors determined a primary indication after thoroughly reviewing the patient's clinical information.

Statistical analysis

All data were analyzed in 20.0 SPSS program (IBM Corp, Armork, NY, USA). Categorical variables were expressed as numbers with percentages and compared using the Chi-squared or Fisher's tests and Mann Whitney U-test, where appropriate.

RESULTS

During 12 years, tracheostomies were performed in 37 children, including 17 (45.9%) males, and 20 (54.1%) female cases in our pediatric surgery department. Tracheostomy opening ages ranged from 2 months to 14 years, and the median tracheostomy opening age was 5 months.

Nineteen cases (51.4%) were delivered by C/S. The mean birth weight was 2047±809.1 g (min: 560 g–max: 3280 g). Ten cases were delivered at <30 gestational weeks (GWs), 14 cases between 31–37 GWs, and 5 cases at ≥38 GWs. While 23 neonates (62.2%) were intubated after delivery, emergency tracheostomies were performed in 3 (8.1%) neonates in the delivery room due to tracheal atresia in 2 and mandibular agenesis in 1. Tracheostomy was performed in six newborns in the first 2 days postnatally, while tracheostomy was performed in 28 (75.7%) patients after 2 months.

BPD (n=9), respiratory distress syndrome (n=8), severe tracheomalacia (n=5), esophageal atresia (OA) and tracheoesophageal fistula (TEF) (n:4), subglottic stenosis (n=3), tracheal atresia (n=2), narrow thorax (n=2), congenital laryngeal polyp (n=1), congenital central alveolar hypoplasia (n=1), acute bronchiolitis due to respiratory syncytial virüs (n=1), meconium aspiration syndrome (n=1), and congenital diaphragmatic hernia (CDH) with unilateral lung agenesis (n=1) were detected in respective number of cases. Twelve patients had major cardiologic anomalies, and 10 patients were syndromic. As additional pathologies, epilepsy (n=9), congenital hypotonia (n=6), cerebral palsy (n=4), urinary system anomaly (n=4), spinal muscular atrophy (n=3), cystic fibrosis (n=2), hydrocephalus and meningomyelocele (n=1), osteogenesis imperfecta (n=1), Hirschsprung disease (n=1), anal atresia (n=1), omphalocele (n=1), and hypothyroidism (n=1) were detected. The primary disease causes of patients requiring tracheostomy were pulmonary origin (n=8), anatomical/airway obstruction origin (n=8), and neurological origin (n=21). Distributions of patients' diagnoses are summarized in Table 1.

Twenty-four cases (64.9%) did not have history of any operation before the tracheostomy; while TEF repair had been performed in 4, primary esophageal repair in 3 cases with esophageal atresia, gastrostomy opening in 3, bronchoscopy in 3, ileostomy opening in 2, and esophagostomy in 1 case.

Emergency tracheostomy was performed in 8 (21.6%) cases, while planned tracheostomy in 29 (78.4%) cases. Except for two cases (14- and 7-month-old), the mean duration of intubation in 35 patients until the tracheostomy was 80.14±74.12 days (min: 1 day-max: 300 days). The mean body weight of the patients at the onset of the surgery was 3580±1795.7 g (min: 560 gr-max: 7000 g). Simultaneous surgeries were not performed in 21 (56.8%) patients; whereas concomitant interventions bronchoscopy (n=8), catheter insertion (n=4), Nissen antireflux surgery with

Table 1. Distribution of patients' diagnoses

	n	%
Primary diseases*		
Bronchopulmonary dysplasia (BPD)	9	24.3
Respiratory distress syndrome (RDS)	8	21.6
Severe tracheomalacia	5	13.5
Oeesophageal atresia (OA)+TEF	4	10.8
Subglottic stenosis	3	8.1
Tracheal atresia	2	5.4
Narrow thorax	2	5.4
Congenital laryngeal polyp	1	2.7
Congenital central alveolar hypoplasia	1	2.7
Acute bronchiolitis due to syncytial respiratory virus	1	2.7
Meconium aspiration syndrome (MAS)	1	2.7
CDH with unilatreal lung agenesis	1	2.7
Major cardiac pathology		
Yes	12	32.4
No	25	67.6
Sendromic baby		
Yes	10	27
No	27	73
Additional pathologies*		
Epilepsy	9	24.3
Congenital hypotonia	6	16.2
Cerebral palsy	4	10.8
Urinary system anomaly	4	10.8
Spinal muscular atrophy	3	8.1
Cystic fibrosis	2	5.4
Hydrocephalus+meningomyelocele	1	2.7
Osteogenesis imperfecta	1	2.7
Hirschsprung disease	1	2.7
Anal atresia	1	2.7
Omphalocele	1	2.7
Hypothyroidism	1	2.7

TEF: Tracheoesophageal fistula; CDH: Congenital diaphragmatic hernia. *Our patients have more than one diagnosis.

gastrostomy (n=4), recurrent TEF repair (n=1), esophagoscopy for suspected foreign body obstruction (n=1), inguinal hernia repair (n=1), excision of the granulation tissue from the esophagotomy margin (n=1), and muscle biopsy (n=1) were performed.

During the operation and early postoperative days, there was no problem in 34 (91.9%) patients, while 2 (5.4%) neonates with tracheal atresia were lost in the 1st and 2nd postnatal days. One patient was desaturated (2.7%) due to misplaced cannula during the dressing; this cannula was safely inserted again after intratracheal intubation. As complications of tracheostomy, cannulas were removed in 2 patients, tracheal granulation was formed in 1 patient, and cannula occlusions were seen in 2 patients on the postoperative 2nd and 10th days. Distribution of postoperative complications for indication is summarized in Table 2.

All cases referred to us for trakeostomy from intersive care units. Twenty-three cases (62%) were referred from the neonatal and pediatric intensive care departments of our hospital, and 8 patients from other hospitals were referred to pediatric surgery for tracheostomy. After the surgical procedure, all patients were transferred by ambulance to the departments in the hospital or other hospitals to which they were referred.

The median follow-up period after tracheostomy is 26 months (min: 0 day–max: 138 months); twenty-three cases (62.2%) survived, and 14 (37.8%) cases died. The median life expectancy after tracheostomy was 15 days (min: 0 day–max: 90 days) of the 14 patients who were lost. Among the surviving patients, two tracheostomies were closed in a boy with CDH, and in a girl with OA + distal TEF + severe tracheomalasia + Fallot tetralogy, 3 years later. Neurological problems were seen in 8 of 21 (38%) and cardiological problems in 5 of 12 (41%) cases; whereas the effect of any variable perse, including neurological problems, on mortality was not statistically significant (p>0.05). Demographics and clinical characteristics and outcomes of patients are summarized in Table 3.

Table 2. Distribution of postoperative complications for indication

Indication for tracheostomy	Cannula removal	Granulation	Cannula occlusion	Replacing the cannula with a large- caliber cannula*
Pulmonary	+			
Neurologic causes				
Anatomic/airway obstruction	+	+	++	+

*Tracheal atresia case in which tracheostomy tube can be opened.

Table 3. Demographics and clinical characteristics and outcomes of patients

	Overall (n=37)	Alive at follow-up (n=23)	Died (n=14)	p
Patient's age				
1 month and below	9 (24.3)	2 (8.7)	7 (50)	0.439
1 month ≥6 month	19 (51.4)	15 (65.2)	4 (28.6)	
6 month ≥1 year	6 (16.2)	3 (13.05)	3 (21.4)	
Over 1 year	3 (8.1)	3 (13.05)	0 (0)	
Sex				
Male	17 (45.9)	12 (52.2)	5 (35.7)	0.498
Female	20 (54.1)	11 (47.8)	9 (64.3)	
Tracheostomy status				
Emergency	8 (21.6)	3 (13)	5 (35.7)	0.215
Planned	29 (78.4)	20 (87)	9 (64.3)	
Indication for tracheostomy				
Pulmonary	8 (21.6)	5 (21.7)	3 (21.4)	0.99
Neurologic causes	21 (56.8)	13 (56.5)	8 (57.1)	
Anatomic/airway obstruction	8 (21.6)	5 (21.7)	3 (21.4)	
Birth weight (g)				
Mean±SD (min, max)	2047.84-809.1 (560–3280)	2386±537.7 (1720–3000)	1865±1007.3 (560–3130)	0.350
Operation weight (g)				
Mean±SD (min, max)	3580±1795.7 (560–7000)	4290±1806 (1720–700)	2870±1619 (560–5580)	0.364
Gestational weeks (weeks)				
Mean±SD (min, max)	33.85±4.17 (25–39)	34.67±2.9 (31–39)	33.67±6.02 (25–39)	0.539

Chi-square tests, p<0.05 is significant and Mann Whitney U tests, p<0.05 is significant.

DISCUSSION

Decision to perform tracheostomy in pediatric patients depends on many factors, including the severity of the airway obstruction, the difficulty and duration of intubation, and the condition of the underlying diseases. Each factor should be evaluated in collaboration with the surgical team and pediatricians.[5] Pediatric tracheostomy is performed approximately in 0.2% of inpatients in tertiary pediatric hospitals.[2] Our pediatric surgery department has a surgical neonatal intensive care unit, where medical care of the newborns undergoing surgery, and postoperative follow-ups of the patients are performed. Required tracheostomies of the infants and children in our hospital's pediatric intensive care unit, neonatal intensive care unit, and intensive care units of other external centers or private hospitals were carried out by us. Tracheostomies were performed in 37 children in our center during 12 years. All cases were referred to our department for tracheostomy; 62% of cases who were followed up in the intensive care units of our hospital and 22% of patients in the intensive care units of other external centers. The time elapsed up to the transfer of the patients to the intensive care units of our hospital or referrals from external centers to us ranged between 1 day and 150 days. Contrary to the literatüre,[1,6,7] the female patients were more numerous in our study, and consistent with the literature, the median age at tracheostomy was 5 months.

In a review of children younger than 2 years who underwent tracheostomy, it was shown that patients weighing <2.5 kg at the time of surgery did not pose a higher risk of death/complications in the first post-operative 30 days. A multivariate logistic regression model has shown that the presence of BPD was the only adverse prognostic factor in this group of patients.[8] In our study, the mean birth weight of patients was 2047±809.1 g (range: 560–3280 g), and the mean body weight of the patients on the day of surgery was 3580±1795, 7 g (range: 560–7000 g). In our study, any statistically significant relationship was not found between birth weight, body weight of the patients on the day of surgery, and mortality. Only one of 9 patients with BPD died during the follow-up period.

Children need tracheotomy under emergency or elective conditions for various indications.[1] In our study, emergency tracheostomy was performed in 8 (21.6%) and planned tracheostomy in 29 (78.4%) patients. In the last decade, tracheostomy indications have been changed from upper airway obstructions secondary to infections to prolonged mechanical ventilation (1'in 5'in). The survival rate of extreme prematurity, BPD, and other complex cardiopulmonary diseases in the newborn continues to increase. The most common indication for pediatric tracheostomy is the need for long-term ventilation, as premature care and complicated term newborn care have developed worldwide.[2,7] In our study, 23 (62.2%) neonates were intubated immediately after birth. The indications for tracheostomy in 3 (8.1%) patients who needed urgent intubation but could not be intubated were related to obstructive causes (tracheal atresia, mandibular agenesis, and airway obstruction in a 7-month-old patient with suspected foreign body aspiration). In our study, long-term mechanical ventilation was the most common indication for tracheostomy. Duration of intubation of 35 patients until the creation of a tracheostomy was 80.14±74.12 days (range: 1–300 days). In many studies, it has been emphasized that early tracheostomies decrease mortality rates in the intensive care units. Some studies have shown that mortality and morbidity increase significantly when ventilation therapy is needed for more than 10 days. In our cases, the duration of intubation until tracheostomy was longer compared to the literature. The reason for this prolonged intubation was also emphasized in some other studies,[6] in that pediatric patients could tolerate intubation better than adults, and families did not allow emergency tracheostomies to be performed for their children.

Complication rates of pediatric tracheostomies are reported to vary between 11% and 51% in the literatüre.[6] In many reported series, the mean complication rate was approximately 40%.[3] The severity of these complications ranges from intraoperatively controlled bleeding to decannulation or cannula occlusion to death. The morbidity and mortality of tracheostomy in children are higher than in adults because the trachea of children is more susceptible to injury and the surgical incision is smaller.[6] In addition, the need for long-term tracheostomy use in this age group, the presence of associated comorbidities, and the small diameter of the airway and the cannula are the factors adversely affecting complication rates.[3] An emergency tracheostomy significantly increases the risk of complications compared to a controlled elective procedure.[3] Despite all this, complication rates have a tendecy to decrease in the recent years.[3] In our study, in 34 (91.9%) patients, any complication was not encountered during surgery, and our early postoperative complication rate was 16.2%. Two neonates (5.4%) with tracheal atresia died on the first and second postoperative days. One patient (2.7%) was desaturated in the operating room due to incorrect placement of the cannula during dressing. After intratracheal intubation, the tracheostomy stoma was matured, and the cannula was safely reinserted. In the postoperative period, our tracheostomy complications were accidental decannulation in 2, granulation in 1 cannula occlusion in 2, and need to replace the cannula with a large-caliber cannula in 1 patient.

Complications that occur during surgery are usually due to air leaks into pulmonary interstitium such as pneumothorax, pneumomediastinum, and subcutaneous emphysema.[3] In one study, cases of subcutaneous emphysema, which resolved were reported 7.6%;[6] in another study, pneumothorax and subcutaneous emphysema were reported with the incidence rates of 9.5% and 1.6%, respectively.[9] These complications were not seen in our patients.

Excessive bleeding during the surgical procedure may be due to injury to the thyroid gland, innominate artery, and

large cervical/ectopic vessels. Bleeding is prevented by a careful dissection, ligation, or cauterization of the bleeding vessel. The rate of bleeding was reported as 0.7% in a study,[10] and as 3.2% in another study.[9] We did not observe any peroperative/postoperative bleeding in our patients. However, because of our study had a retrospective design, intraoperatively controlled bleeding may have been disregarded and not described in the operative notes.

Patients with BPD, a frequent comorbidity associated with prematurity, have more abundant and viscous secretions, which increase the risk of obstructive complications.[11] In a study of 39 cases, cannula occlusion was observed in 2,[6] and in another study, in 3 out of 63 patients.[9] In our study, cannula occlusion was observed in two patients with BPD on the postoperative 2nd and 10th days. It is recommended to have a spare tracheostomy cannula at the bedside, because of the obstruction may not be resolved despite aspiration and accidental decannulation is a possibility.[6] Spare tracheostomy cannula is always available at the bedside of all patients that we have performed tracheostomy in our department. Having a disinfected spare tracheostomy cannula in hospital or at home in all cases during the well time of tracheostomy tube ensures to be on the safe side in events that may result with mortality, such as cannula occlusion/decannulation.

One of the dangerous complications that develop within the first postoperative 5 days is accidental decannulation of the tracheostomy. Newborns and children are more likely to be accidentally decannulated; hence, precautions are taken during the surgical procedure to prevent this complication and facilitate reinsertion. Nonabsorbable "rescue"/"permanent" sutures are fastened to either side of the tracheal incision during insertion. These sutures can be used to elevate the trachea up to the skin surface and assist in replacing the new tracheostomy tube.[2] Accidental decannulation was reported at a rate of 7.9% in a study performed in our country,[6] and 4.8% in another study without any mortal complication.[6,9] We always use these sutures in our tracheostomies; hence, it is easy and seamless to reinsert the cannula. The prognosis of our 2 patients who had accidental decannulation was not unfavorable, thanks to early recognition of this complication by our well-trained intensive care nurses.

The incidence of the tracheal granulation varies between 12.3 and 66%.[3] Since some studies have shown that large and obstructive granulomas are rarely seen and surgical excision of them does not decrease recurrence rates, authors have recommended against excision of the nonobstructive granulomas in children with stable and uneventful tracheostomies.[3] Airway endoscopy is important in all patients who are scheduled for decannulation, and it is important to excise granulomas that will prevent decannulation.[5] In a study of 63 cases, the most common complication associated with tracheostomy after discharge was tracheal granulation, which was seen in 5 (7.9%) patients.[9] In our study, symptomatic granulation tissue was detected at a rate of 2.7%, and they were excised because they prevented decannulation. Since we did not perform routine bronchoscopy in patients for whom decannulation was not planned, it is estimated that this number may be higher in patients without symptoms.

Tracheocutaneous fistula may be tolerated in the early postoperative period, but may become a problem in the long term. It can prevent spontaneous closure of the tracheostomy. The incidence of tracheocutaneous fistula in the series is between 3.1% and 57.3%.[3] In our study, tracheocutaneous fistula was closed in 2 (8.7%) patients. The indications of TEF closure in these patients were in compliance with relevant recommendatiions in the literatüre.[3] Tracheostomy was performed in infants aged <1 year that received various diagnoses (CDH and OA+distal TEF+severe tracheomalacia+Fallot Tetralogy) and they had tracheostomies for at least 2 years.

Some retrospective studies reported mortality rates associated with pediatric tracheostomy ranging between 0 and 3.6%.[11] In many studies,[1,7,12] different mortality rates have been reported (11.5%, 12.4%, and 12.4%,), but tracheostomy-related death was not observed in any of them. In a recent study, mortality rate was 27%, and mortality was due to tracheostomy-related accidents, that included accidental decannulation, hemorrhage from tracheostomy, and mucus plugging.[4] The mortality rate was 37.8% in our study, and it was higher than the literature, but none of our patients died due to tracheostomy procedures. The high mortality rate is thought to be due to the underlying surgical pathology. In our study, progression of the underlying disease, accompanying medical conditions, and surgical pathologies affected the mortality rates of patients with tracheostomies, despite our minimal operative complications. In our study, although it is noteworthy that neurological (38%) and cardiological problems (41%) greatly increased in our patients, the effects of any variable per se, including neurological problems on mortality rates, were not statistically significant ($p>0.05$).

CONCLUSION

Pediatric tracheostomy is important for the care of critically ill patients who cannot be weaned from ventilatory support. Tracheostomies performed with appropriate indications at the right time are life-saving. Because of its high morbidity and complications, tracheostomy indications should be evaluated in collaboration with neonatologists, pediatricians, and intensive care physicians. Pediatric tracheotomy can be successfully performed with minimal complication rates using appropriate surgical technique and adequate postoperative care. Tracheostomy care is as important as opening a tracheostomy tract. Patient care with tracheostomy is a special and important issue for both medical personnel and those who take care of the patient at home.

Ethics Committee Approval

This study approved by the Zeynep Kamil Maternity and

Children's Diseases Health Training and Research Hospital Clinical Research Ethics Committee (Date: 22.09.2021, Decision No: 157).

Informed Consent

Retrospective study.

Peer-review

Externally peer-reviewed.

Authorship Contributions

Concept: O.D.A.; Design: O.D.A.; Supervision: O.D.A.; Fundings: O.D.A.; Materials: O.D.A., A.C.; Data: O.D.A., A.C.; Analysis: O.D.A., A.C., M.H.Ç.; Literature search: O.D.A., A.C., M.H.Ç.; Writing: O.D.A., A.C., M.H.Ç.; Critical revision: O.D.A., A.C., M.H.Ç.

Conflict of Interest

None declared.

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12 Yıllık Süreçte 37 Çocukta Trakeostomi Tecrübelerimiz: Retrospektif Çalışma

Amaç: Çocuklarda trakeotomi için en önemli endikasyon kardiyopulmoner ve nörolojik hastalıklar nedeniyle uzun süreli entübasyondur. Pediatrik trakeostomi %10 ile %58 arasında değişen bir komplikasyon oranı ve %0 ile %3,6 arasında değişen bir ölüm oranı ortaya koymaktadır. 12 yıllık trakeostomi deneyimlerimizi anlatmayı amaçladık.

Gereç ve Yöntem: Bu çalışma, Türkiye'de Çocuk Cerrahisi Kliniğimizde 2009-2021 yılları arasında trakeostomi uygulanan çocuk hastaların tıbbi kayıtlarının retrospektif olarak incelenmesidir.

Bulgular: Bölümümüzde 12 yıl boyunca 37 çocuğa trakeostomi açıldı. 17'si erkek (%45.9), 20'si kadın (%54.1) idi. Ortanca trakeostomi yaşı 5 aylıktı (min: 2ay-maks: 14yıl). Acil trakeostomi 8'inde (%21,6), planlanan trakeostomi 29'unda (%78,4) yapıldı. Ameliyat sırasında ve ameliyat sonrası erken günlerde 34 hastada (%91,9) herhangi bir sorun yaşanmadı, trakeal atrezili 2 yenidoğan (%5,4) birinci ve ikinci günlerde kaybedildi. Bir hastada pansuman sırasında kanülün yanlış yerleştirilmesi nedeniyle desatüre (%2.7) oldu, kanül entübasyondan sonra tekrar güvenli bir şekilde yerleştirildi. Trakeostomi komplikasyonları olarak 2-kanül çıkması, 1-granülasyon, 2-kanül oklüzyonu (biri postoperatif 2.günde ve diğeri ise postoperatif 10.günde) görüldü. 23 olgu (%62.2) hayatta kaldı, 14 olgu (%37.8) kaybedildi. Hayatta kalan hastalardan 3 yıl sonra KDH'li bir erkek çocukta ve EA+Distal TEF+Şiddetli Trakeomalazi+Fallot Tetralojisi olan bir kız çocuğunda iki trakeostomi kapatıldı.

Sonuç: Pediatrik trakeotomi, uygun cerrahi teknik ve yeterli postoperatif bakım ile minimal komplikasyon oranları ile başarıyla gerçekleştirilebilir.

Anahtar Sözcükler: Acil trakeostomi; çocuk; komplikasyon; planlı trakeostomi.