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TREATMENT OF TRACHEOESOPHAGEAL FISTULA AND ESOPHAGEAL ATRESIA; A CLINICAL REVIEW

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Abstract:

Aim: *To analyze the morbidity and mortality of 38 patients with variants of esophageal atresia and tracheoesophageal fistula treated.*

Study design: *This is a retrospective study held in the Pediatric Unit-II of Services Hospital Lahore for one-year duration from December 2019 to December 2020. Data was collected from hospital files.*

Methodology: *The history of 38 patients with esophageal atresia and tracheoesophageal fistula was reviewed.*

Results: *The mean birth weight was 2.5 kg and the mean gestational age was 38 weeks (range 30 to 38 weeks). The risk classification was based on Waterston's classification and consisted of 18 'A' cases, 12 'B' cases and 8 'C' cases. Many patients have experienced associated abnormalities including heart, skeletal, neurological, and renal and anorectal defects. Anastomotic leakage was found in 8 patients (21.05%), sepsis in 12 (13.5%), and pneumothorax in 3 (7.8%).*

Conclusion: *The results of this congenital malformation requiring surgical treatment, is less than optimal in our setup. The likely reasons are late presentation, and less than ideal neonatal services.*

Keywords: *Atresia, fistula, sepsis, congenital anomalies, thoracotomy.*

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INTRODUCTION:

The first recorded case of esophageal atresia was in 1670 by Durston in one of the female thoracopagus twins. Thomas Gibsson in 1667 described the most common form of esophageal atresia with a distal fistula. Even after a hundred years of progress in treating esophageal atresia and tracheoesophageal fistula, these newborns continue to be a challenge for pediatric surgeons. The disease incidence is 2.4 per 10,000 live births. Many congenital anomalies are associated with this abnormality. Factors such as low birth weight, delay in diagnosis, late referral, and limited sources play an important role in the poor outcome of our patients. An attempt was made to analyze the factors responsible for morbidity and mortality.

METHODOLOGY:

This is a retrospective study held in the Pediatric Unit-II of Services Hospital Lahore for one-year duration from December 2019 to December 2020. The results of all patients with esophageal atresia and tracheoesophageal fistula were analyzed. Cases were classified into A, B, C, three risk categories based on severity, birth defects, presence or absence of pneumonia, according to Waterston's classification "A" and "B" were operated after initial resuscitation. The pre-operative tests included basic tests (CBC, blood sugar, urine DR, and serum electrolytes). In all cases, an abdominal ultrasound scan was performed to help recognize any accompanying abdominal deformities. All patients had echocardiography. Right-sided thoracotomy was performed through the 4th intercostal space with an additional pleural access. The lower segment was identified and the fistula ligated and separated from the trachea. The upper pouch was mobilized and a single layer end-to-end anastomosis was made with 4/0 vicryl. A nasogastric tube was passed out of anastomosis and feeding through a nasogastric tube was started on the third day postoperatively. Waterston type "C" patients received complete parental nutrition. Once they were stable, the esophagus and gastrostomy were created and gastrostomy feeding was commenced.

RESULTS:

The mean birth weight was 2.5 kg and the mean gastric age was 38 weeks (range 30 to 38 weeks). According to the Waterston Classification, this group consisted of 18 "A" cases, 12 "B" cases and 8 "C" cases. There were accompanying anomalies in 14 (36.8%) patients, including cardiac and neurological defects, as well as kidney and rectal defects.

TABLE 1: Age at presentation

Age	No of Patients	Percentage
Within 24 Hours	12	31.57
24-48 Hours	10	26.30
More than 48 Hours	16	42.10

Anastomosis leak occurred in 8 (21.05%) patients; sepsis occurred in 12 patients (31.5%). Three patients developed Pneumothorax (7.8%). Late complications included gastroesophageal reflux in 8 (21.05) patients.

TABLE 2: Weight at presentation

Weight	No of Patients	Percentage
Less than 200 gm	4	10.5
➢ Than 2000 gm	9	23.6
➢ 2500 gm	10	26.3
More than 3000 gm	15	39.4

Survival in relation to risk categorization is shown in Table 3.

TABLE 3: Western Classification and survival

Category	No. of Patients	Submitted for surgery	Primary staged repair	Survival	Percentage
A	18	14	4	13	72 .0
B	12	11	1	06	50 .0
C	08		4	01	12.5
Total	**38**	**25**	**9**	**20**	

25 neonates were treated by primary surgery and repair. Esophagus and inverse gastrostomy were performed in 11 patients, 8 of whom did not have a fistula. The mortality in the study was 47.3% (18 patients)

DISCUSSION:

Esophageal atresia with or without a tracheoesophageal fistula is not a rare birth defect to present at Quetta Children's Hospital, often mimicking feeding difficulties and respiratory distress in the first days of life. The first clinical and pathological description of tracheoesophageal fistula and esophageal atresia was made by Gibbson in 1670. Esophageal atresia with TEF occurs in one of 3,000 to 5,000 births. GPs caring for newborns should be aware of both the clinical symptoms and the management of these newborns. Before the first successful repair was carried out in 1939, the condition was equally disastrous. Over the past 50 years, improvements in neonatal surgical techniques, pre-operative intensive care support, anesthesia and good post-operative care have improved outcomes. An Indian pediatric surgeon reported a large study of 303 cases. Among our patients, 73.68% were men and 26.31% were women, while in the USA the incidence of men is 55%. Table 1 shows that 42% of patients came to us after 48 hours of delivery. This delay in presentation changes the category from "A" to "B" because of pulmonary involvement which adversely affects the prognosis. Over 70% of newborns had a chest infection at admission and required intensive respiratory care. The most common type of esophageal atresia is characterized by a blind proximal esophageal sac with a fistula between the trachea and the distal esophagus. Many anatomical variations of esophageal atresia with and without tracheoesophageal fistula have been described. In this study, 36.81% (14 neonates) had other related defects in addition to esophageal atresia. Rectal anomalies were the most common accompanying anomaly. A wide range of related anomalies, such as ectopic, congenital heart disease, hypospadias. No chromosomal aberrations remained unrecognized due to the inability to conduct the necessary research at the institute. We performed esophagus and gastrostomy in patients with esophageal atresia with a long gap, with fistula ligation in 4 patients, 3 died. The mortality rate in our patients in this study is 47.3%, mainly due to severe concomitant birth defects and sepsis. In an Italian study, the mortality rate was 92% in 1972, dropped to 55% in 1991 due to a pre-operative evaluation, a good intensive care unit and early surgery. The mortality rate in the large US report is 18%, 6%, and 3% in patients with long intermediate and short interruptions. Spitz et al. In a study published in 1994, reported a range of 3-7.8% mortality according to Waterston's A-C risk categories.

CONCLUSION:

The increase in mortality (47.3%) in this study is mainly due to severe congenital anomalies, sepsis, and delay in diagnosis and referral to pediatric surgery. Survival can be improved with early diagnosis and early referral to a tertiary hospital. The results of this congenital malformation requiring surgical treatment are less than optimal in our system. Late applications and inadequate neonatal services are likely causes.

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