Malaysian Association of
PAEDIATRIC SURGERY
ANNUAL SCIENTIFIC AND GENERAL MEETING 2022
4JUNE 2022 / THE EVERLY PUTRAJAYA

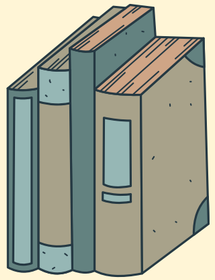
SURVIVAL FOLLOWING SURGERY IN 38 CASES OF OESOPHAGEAL ATRESIA (OA) AND/OR TRACHEOESOPHAGEAL FISTULA (TOF) OVER ONE DECADE

PAEDIATRIC SURGERY UNIT,DEPARTMENT OF SURGERY,
HOSPITAL SULTANAH AMINAH,JOHOR BAHRU

FREE PAPER PRESENTATION

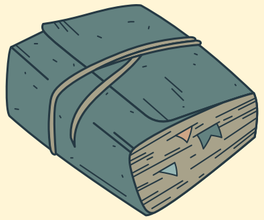
Presenter : Nurul Asyikin Yahya

PRESENTATION OUTLINE

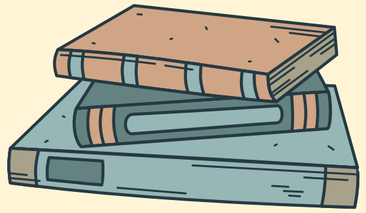


INTRODUCTION

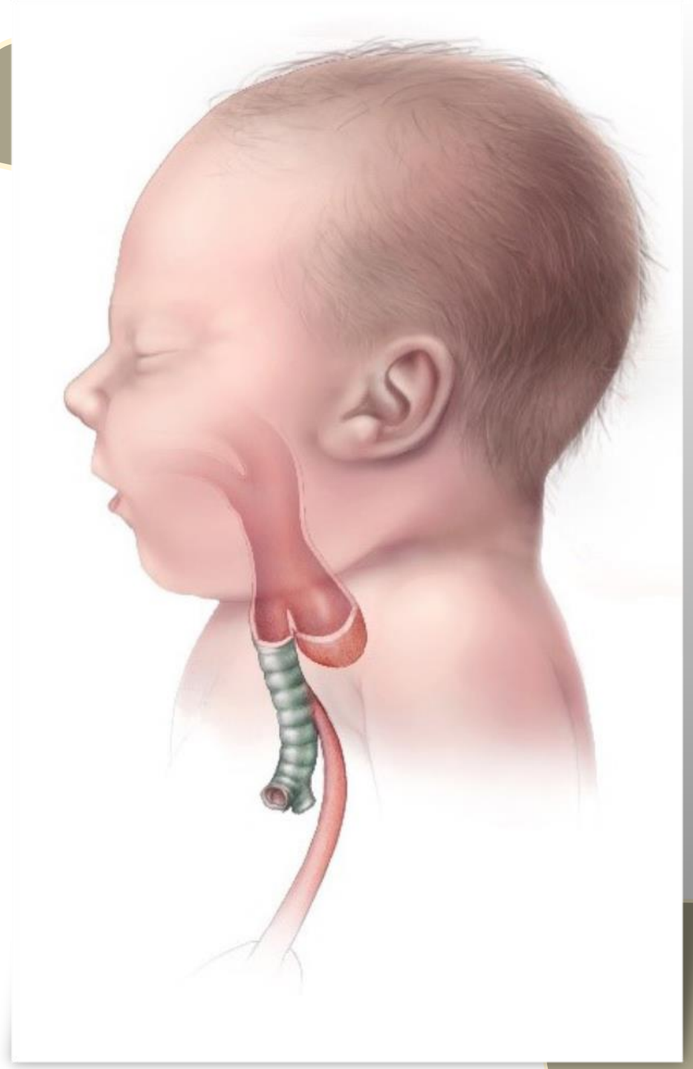
OBJECTIVE



DESIGN & METHOD



RESULT
CONCLUSION



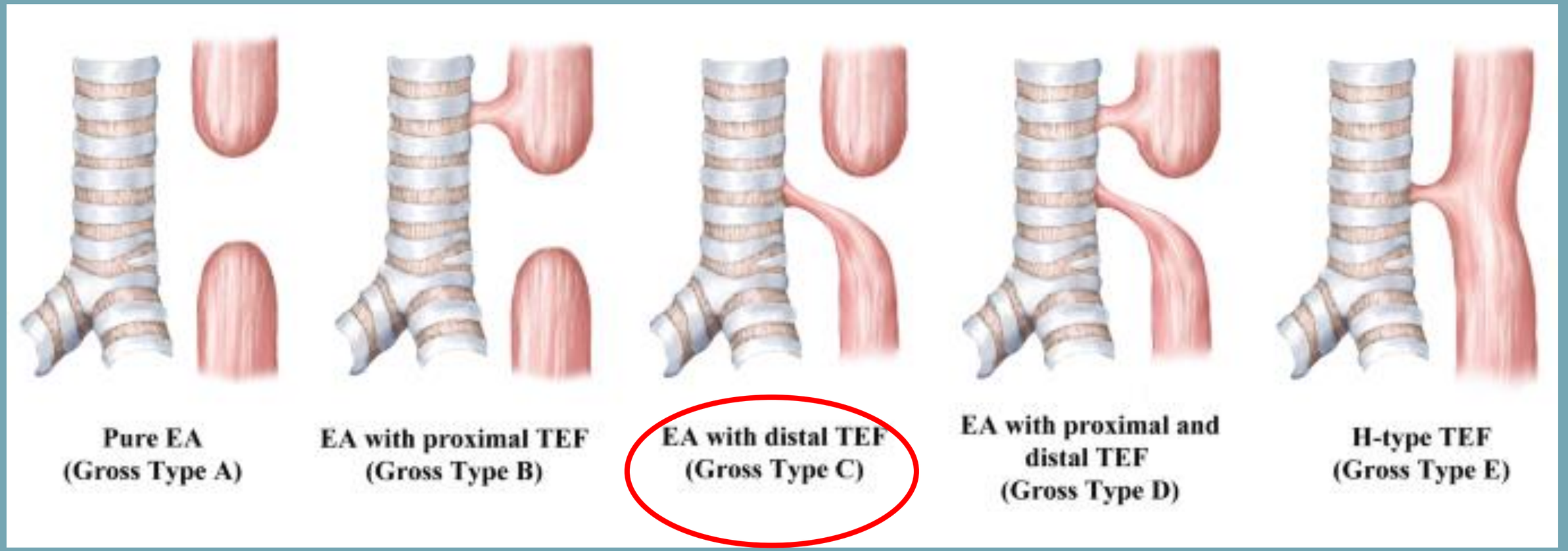
INTRODUCTION

- Birth incidence of Oesophageal Atresia (OA) +/- Tracheoesophageal Fistula (TOF) is **1 : 2500-3000**[1].
- The number of patients with associated anomalies varies from **45 - 60%**[1].
- In 1940, Haight described the first survival following primary anastomosis[1].

SURVIVAL OUTCOME UP TO 90% [2, 3]

1. Spitz L, Kiely E, Brereton R.J and Drake D. Management of Esophageal Atresia. World Journal of Surgery 1993; 17: 296-300.
2. Lilja HE, Wester T. Outcome in neonates with esophageal atresia treated over the last 20 years. *Pediatr Surg Int*. 2008;24:531– 536.
3. Tonz M, Kohli S, Kaiser G. Oesophageal atresia: what has changed in the last 3 decades? *Pediatr Surg Int*. 2004;20:768–772.

BACKGROUND



1. Kluth D. Atlas of esophageal atresia. *J Pediatr Surg*. 1976;11: 901–919.
3. Gross RE. *The Surgery of Infancy and Childhood*. Philadelphia: WB Saunders; 1953.
4. Lu, YH., Yen, TA., Chen, CY. *et al.* Risk factors for digestive morbidities after esophageal atresia repair. *Eur J Pediatr* **180,** 187–194 (2021). https://doi.org/10.1007/s00431-020-03733-1

PUBLISHED LITERATURE

1) Hospital Sultanah Bahiyah, 2013

Review > Med J Malaysia. 2013;68(1):48-51.

Review of oesophageal atresia and tracheoesophageal fistula in hospital sultanah bahiyah, alor star. Malaysia from january 2000 to december 2009

S Narasimman [1], M Nallusamy, S Hassan

Affiliations + expand

PMID: 23466767

Free article

Abstract

Oesophageal atresia (EA) and tracheoesophageal fistula (TEF) is one of the congenital anomaly occurring in the newborns with the incidence of 1 in 2500 births seen worldwide. A retrospective review of newborns admitted to Hospital Sultanah Bahiyah (HSB) from 1st January 2000 to 31st December 2009 was done. The objective was to look at the influence of birth weight, time of surgical intervention, presence of other congenital anomaly and presence of preoperative pneumonia to the immediate outcome (mortality) of the surgery. There were 47 patients with oesophageal atresia, out of which 26 (55%) were males and 21 (45%) females. The distribution of patients by race were 34 Malays (72%), 9 Chinese (19%) and 4 Indians (9%). The birth weight of the babies range from 0.8 kg to 4.0 kg and there was a significant association with the outcome of the surgery ($p< 0.05$). Most of the babies (20) were operated within 24 hours of presentation but there was no significant association to the outcome. 23 (49%) of them were born with congenital malformation and there was a significant association with the outcome of the surgery ($p<0.05$). Based on the chest roentgenogram, 20 (43%) of them had pneumonia with significant association with the outcome ($p<0.05$). The mortality rate is 23% and the causes of death were pneumonia (36%), renal failure (18%), cardiac malformation (18%) and multiple congenital malformations (28%). The outcome of EA and TEF is determined mainly by birth weight, congenital malformations and presence of preoperative pneumonia in HSB.

2) PGIMS, Rohtak, Haryana India, October 2017

Previous Article ToC Next Article

ORIGINAL ARTICLE

Year : 2017 | Volume : 6 | Issue : 4 | Page : 225-230

Clinical profile and short-term outcome of neonates with esophageal atresia and tracheoesophageal fistula at tertiary care center in a developing country: A 25-year experience

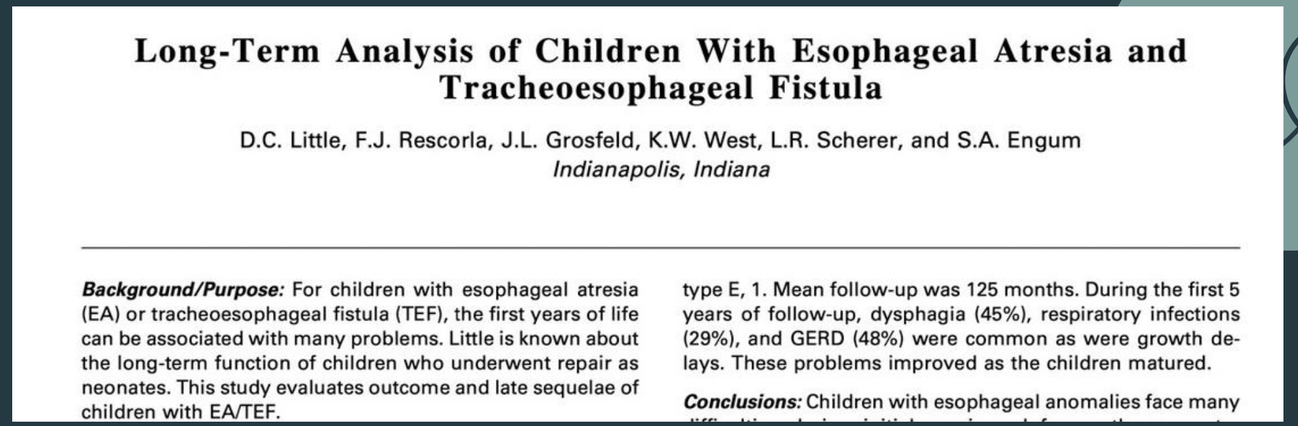
Kamal Nain Rattan[1], Jasbir Singh[2], Poonam Dalal[2]

[1] Department of Paediatric Surgery, PGIMS, Rohtak, Haryana, India

[2] Department of Paediatrics, PGIMS, Rohtak, Haryana, India

Date of Web Publication 17-Oct-2017

3) Indiana University School of Medicine, Indianapolis, 2003



Long-Term Analysis of Children With Esophageal Atresia and Tracheoesophageal Fistula

D.C. Little, F.J. Rescorla, J.L. Grosfeld, K.W. West, L.R. Scherer, and S.A. Engum

Indianapolis, Indiana

Background/Purpose: For children with esophageal atresia (EA) or tracheoesophageal fistula (TEF), the first years of life can be associated with many problems. Little is known about the long-term function of children who underwent repair as neonates. This study evaluates outcome and late sequelae of children with EA/TEF.

type E, 1. Mean follow-up was 125 months. During the first 5 years of follow-up, dysphagia (45%), respiratory infections (29%), and GERD (48%) were common as were growth delays. These problems improved as the children matured.

Conclusions: Children with esophageal anomalies face many

OBJECTIVE

- Immediate outcome (mortality)
- Association with birth weight, presence of congenital anomaly / cardiac anomaly

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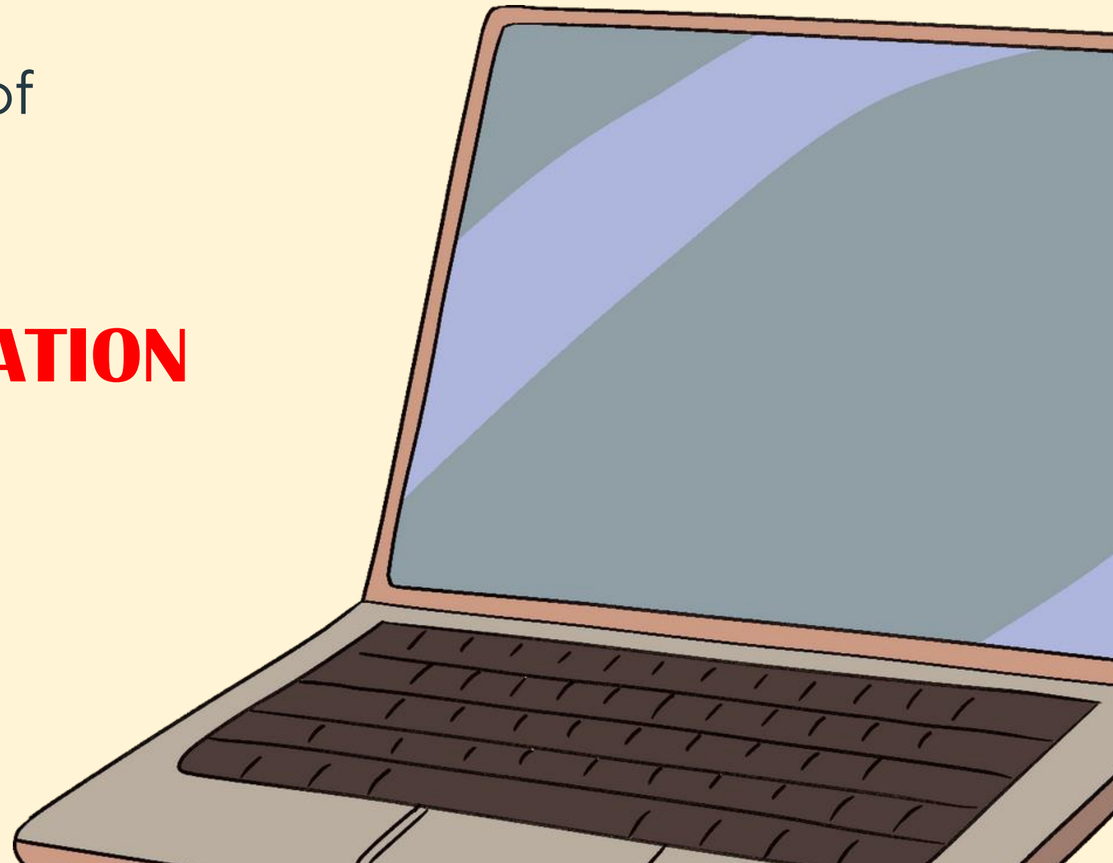
WATERSTON & SPITZ CLASSIFICATION



DESIGN AND METHOD

WHEN & WHERE?

- Data collected retrospectively from tertiary care state hospital, Paediatric Surgery Unit, Surgery Department, **Hospital Sultanah Aminah,JB.**
- **38 patients** included over one decade, **1st January 2009 to 31st December 2021**.

RESULTS

Variables	Number (n) = 38
Birth weight	**2500g** (Range 1.5 - 3.73kg)
Low Birth Weight (<2500g)	**23** (61%)
Gestational age	**38w** (Range 33 - 40w)
Premature Birth (<37 weeks)	**15** (39%)
VACTERL Association	**18** (47%)
Congenital Pneumonia	13 (34%)

TYPES OF OA +/- TOF

TYPE A
Pure Oesophageal Atresia
8 (21%)

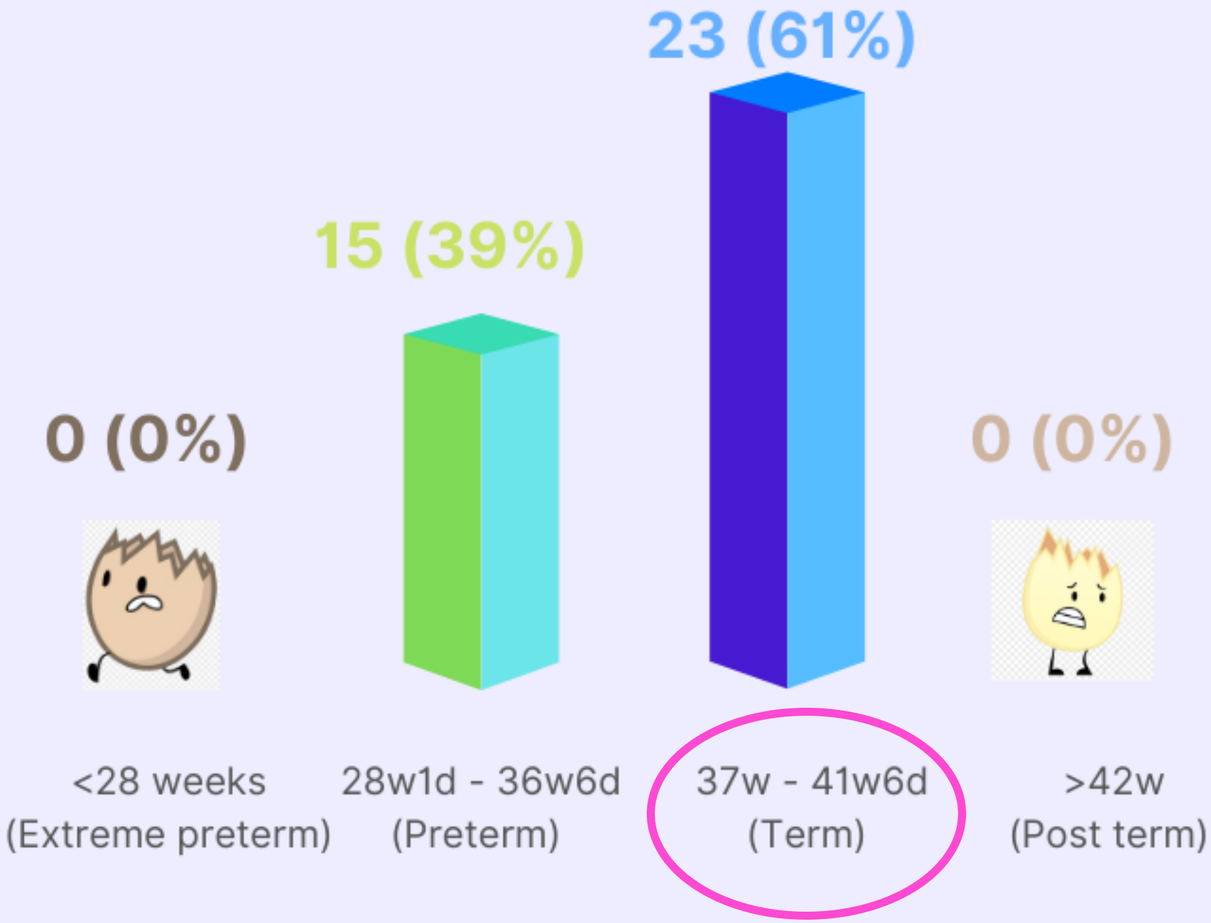
TYPE C
Atresia with Distal Fistula
30 (78.9%)

TYPE B
Atresia with Proximal Fistula
(0%)

TYPE D
Atresia with Double Fistula
(0%)

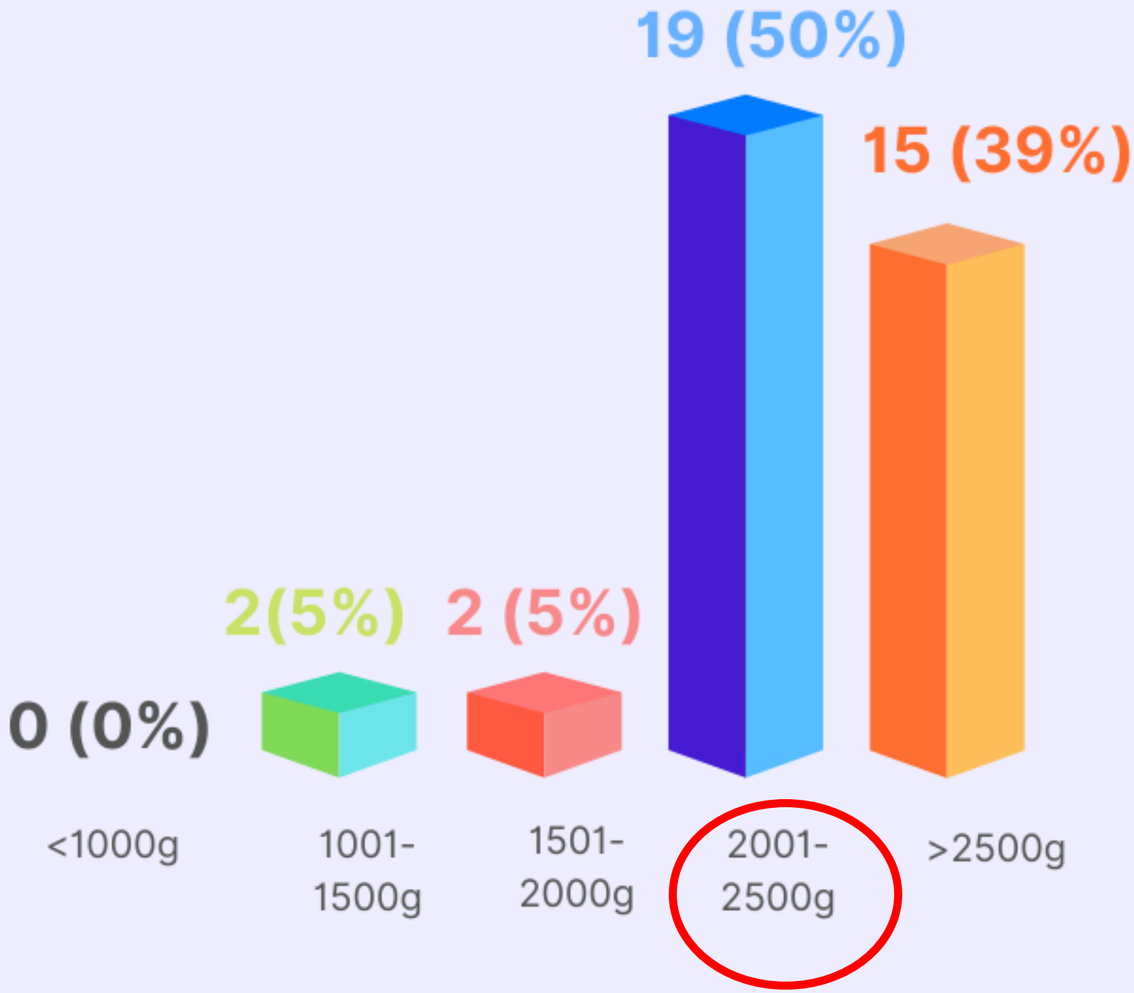
TYPE H
Isolated Fistula
(0%)

Gestational Age



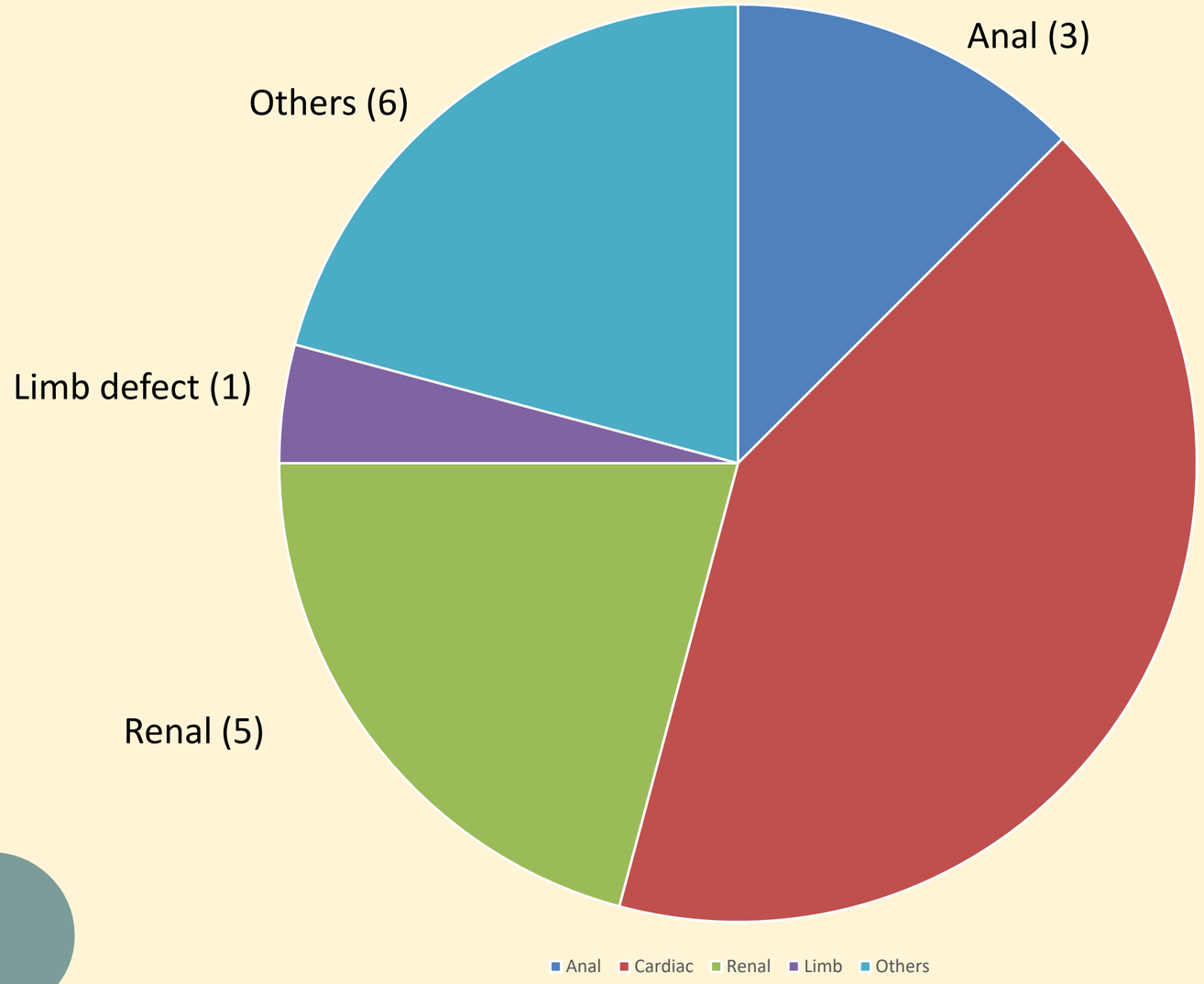
Mean gestational age 38 weeks (ranging from 33 - 40 weeks)

Birth Weight



Mean birth weight 2500g (range 1500g - 3730g)

DISTRIBUTION OF TYPES OF CONGENITAL MALFORMATIONS N=18 (47%)



Cardiovascular (12)

- Tetralogy of Falot (2)
- PDA (5)
- ASD (2)
- VSD (3)

COMPLICATIONS

COMPLICATIONS	TYPE A	TYPE C	No, (%)
1) Anastomotic leak	3	0	**3 (8%)**
2) Anastomotic Stricture	4	9	**13 (34%)**
3) Recurrent Fistula	0	1	**1 (3%)**
4) Gastroesophageal Reflux	4	6	**10 (26%)**
5) Feeding problem / ?dysmotilty	0	2	**2 (5%)**

BIRTH WEIGHT AND SURVIVAL

Hospital Sultanah Aminah JB, 2021

Birth Weight, g	No. of Patients	Survival, No. (%)
<1000	0	0
1001 - 1500	2	1 (50%)
1501 - 2000	2	1 (50%)
2001 - 2500	19	18 (95%)
>2500	15	14 (93%)

Indiana University Medical 1995,US

No. of Patients	Survival, No. (%)
0	0
16	15 (94%)
39	36 (92%)
44	39 (89%)
100	98 (98%)

1. Engum SA, Grosfeld JL, West KW, Rescorla FJ, Scherer LRT. Analysis of Morbidity and Mortality in 227 Cases of Esophageal Atresia and/or Tracheoesophageal Fistula Over Two Decades. *Arch Surg.* 1995;130(5):502–508. doi:10.1001/archsurg.1995.01430050052008

WATERSTON RISK GROUP AND SURVIVAL

Group	Description	No. (%) of Patients	Survival Rate, %
A	Birth weight over 2500g and well	13 (34%)	13 (100%)
B	Birth weight 1800g to 2500g and well or over 2500g with moderate pneumonia and congenital anomaly	18 (47%)	16 (88%)
C	Birth weight under 1800g and well or 1800g to 2500g with severe pneumonia and congenital anomaly	7 (18%)	5 (71%)

Comparison of survival rate of patients with OA/TOF based on Waterston Classification

Group	Spitz 2006 (London)	HSB 2009 (Alor Star, Kedah)	HSA 2021 (Johor Bahru, Johor)
A	99%	100%	**100%**
B	93%	89%	**88%**
C	71%	33%	**71%**

1. Engum SA, Grosfeld JL, West KW, Rescorla FJ, Scherer LRT. Analysis of Morbidity and Mortality in 227 Cases of Esophageal Atresia and/or Tracheoesophageal Fistula Over Two Decades. *Arch Surg.* 1995;130(5):502–508. doi:10.1001/archsurg.1995.01430050052008
2. Narasimman S, Nallusamy M, Hassan S. Review of oesophageal atresia and tracheoesophageal fistula in hospital sultanah bahiyah, alor star. Malaysia from january 2000 to december 2009. Med J Malaysia. 2013;68(1):48-51. PMID: 23466767.1.

COMPARISON OF SURVIVAL RATE ACCORDING TO SPITZ CLASSIFICATION

Group	Description	No. (%) of Patients	Survival Rate, % (HSAJB 2021)	Singapore 2013 (Ann Acad Med)
I	Birth weight over 1500g with no major cardiac anomaly	27 (71%)	27 (100%)	97.4%
II	Birth weight less than 1500g or major cardiac anomaly	10 (26%)	7 (70%)	64.4%
III	Birth weight less than 1500g and major cardiac anomaly	1 (3%)	1% (0%)	27.3%

OVERALL SURVIVAL

OVERALL SURVIVAL RATE 90% (N = 34)

"By the mid-1980s, most neonatal centres were performing primary repair and reporting successful outcomes in up to 90%"

Holcomb and Ashcraft's Paediatric Surgery,7th Edition,2020

DEATH (N = 4)

Causes of death include :

- **severe cardiac anomalies**
- **pulmonary failure**
- **severe sepsis**

CONCLUSION

- Birth weight, congenital and cardiac anomalies influence the outcome after surgery.
- Good birth weight (>1500g) and well child will have a better rate of survival.

STRENGTH, LIMITATIONS & FUTURE CONSIDERATION

Strength

+ Asian population, regional analysis
+ Paediatric Surgery service in Johor
+ Future antenatal counseling and reassurance

Limitation

- Single centre, retrospective study design

FUTURE CONSIDERATION

- Larger patient sample size
- Multicentre study -> better picture Paediatric care in Malaysia

PAEDIATRIC SURGEONS HSAJB

THANK YOU