

A Study of 25 Cases of Tracheoesophageal Fistula Repair

S Mehta, M Porecha, S Nagre, P Mehta, D Udani, K Patel

Citation

S Mehta, M Porecha, S Nagre, P Mehta, D Udani, K Patel. *A Study of 25 Cases of Tracheoesophageal Fistula Repair*. The Internet Journal of Surgery. 2008 Volume 18 Number 1.

Abstract

The objective of this study was to find out the common type of tracheoesophageal fistula, associated anomalies, their impact on morbidity and mortality of patients, and difficulties during the operative procedure and in the postoperative period in our set-up. Infants having anomalies associated with tracheoesophageal fistula had very poor prognosis as compared to those without associated anomalies.

INTRODUCTION

Oesophageal atresia and tracheoesophageal fistula (TOF) are common neonatal conditions that remain a significant challenge to pediatric surgery. This pathology should be considered in the differential diagnosis of a neonate who develops feeding difficulties and respiratory distress in the first few days of life. Incidence is 1 in 4500 live births.

Oesophageal atresia is often associated with other congenital anomalies. Prompt recognition, appropriate clinical management to prevent aspiration and swift referral to an appropriate tertiary care center is very important.

Despite the improvement in survival, the morbidity associated with surgical repair remains high. In this study, we review our two-year experience with patients with EA/TOF. The results may be beneficial for further clinical management of these patients in future.

AIMS OF STUDY

This is a case study of a total of 25 TOF repair cases, operated in GGH and M.P.Shah Medical College, Jamnagar, from Jan. 2006 to Oct. 2007 including 15 males and 10 females and follow-up to Oct. 2007 with the following aims:

To find out

the common type of oesophageal atresia.

abnormalities commonly associated with oesophageal atresia.

the impact of an associated abnormality on morbidity and mortality of patients with oesophageal atresia.

technical difficulties during the operative procedure and

hurdles in the immediate and late postoperative period in our setup.

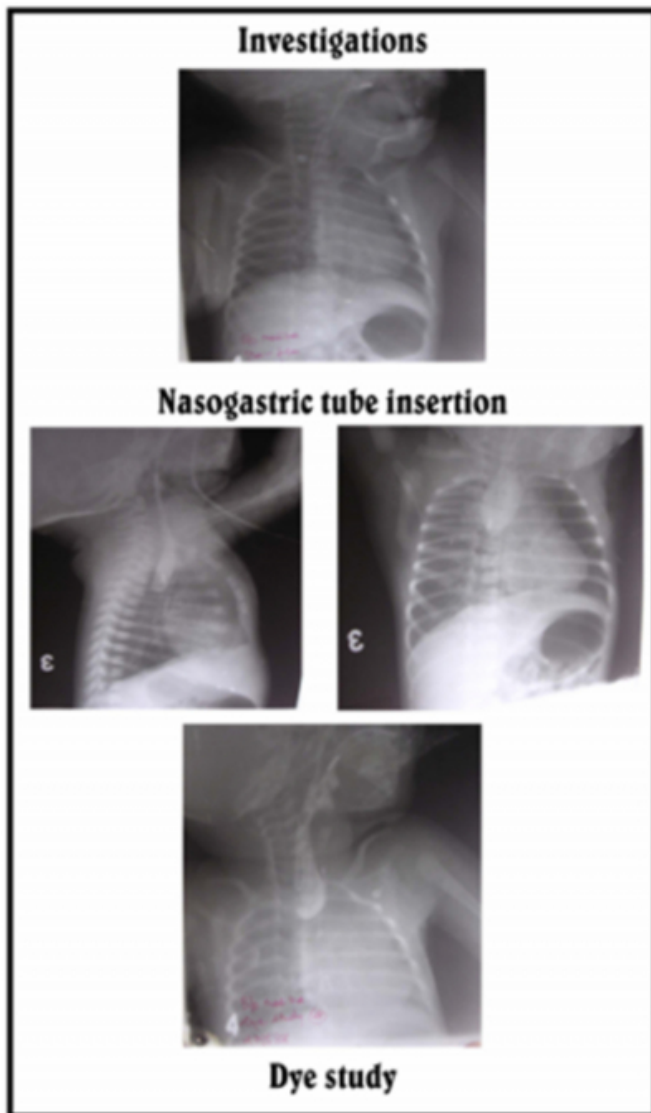
MATERIALS AND METHODS

This comparative study was conducted in 25 patients admitted during the period from January 2006 to October 2007 in the surgical department of GGH at Jamnagar, between operated TOF cases with and without associated anomalies and on difficulties in our setup while managing.

PREOPERATIVE INVESTIGATIONS

Chest x-ray

Figure 1



Dye study

Echocardiography

Blood grouping and keeping compatible blood ready

After giving antibiotics 10 minutes before surgery, a short right posterolateral incision (right side thoracotomy incision) was made below the level of the tip of the scapula in the fourth intercostal space.

After inserting an infant rib spreader, extrapleural dissection was carried out using a moistened cotton-tipped applicator, till the azygous vein was fully mobilised.

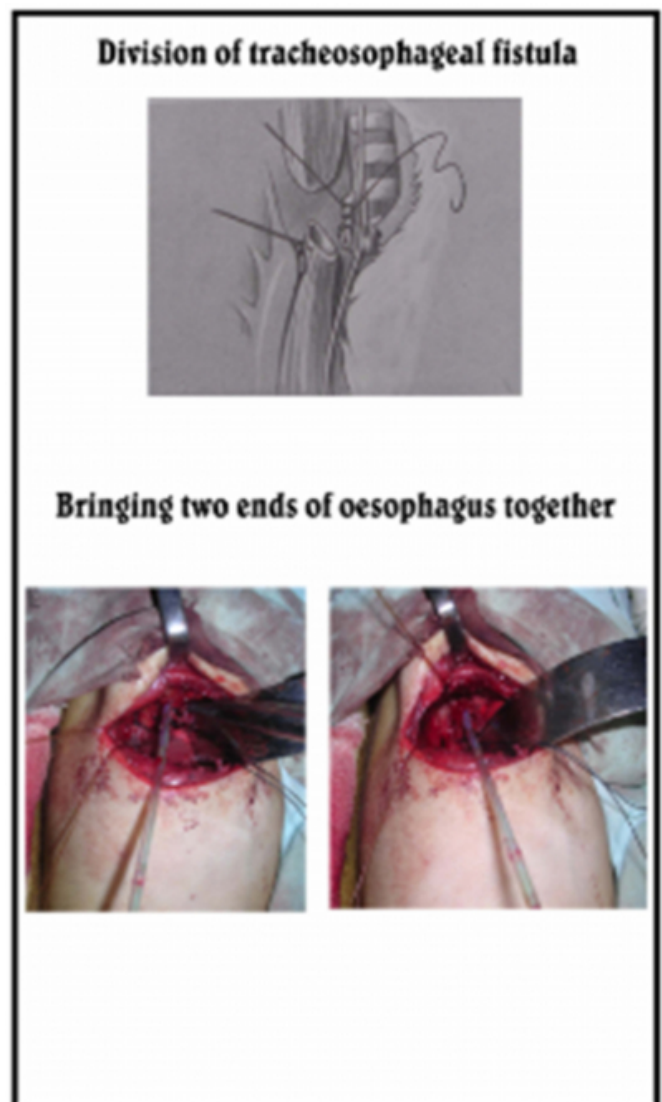
The azygous vein which is often a marker for the site of the TOF as it enters the trachea was divided between two 4-0 suture ties. The TOF was divided by fine tenotomy scissors

and the tracheal side was oversewn with running or interrupted 5-0 sutures.

The upper atretic oesophageal pouch was identified with the aid of the anesthesiologist, who pushed down on the end of the pouch with a previously placed oral tube.

A traction suture was placed at the 3 & 9 o'clock position on the open distal oesophagus and by placing gentle traction in opposite directions, full-thickness suture bites were placed in the midportion of the posterior wall of both ends of the oesophagus with knots tied on the outside.

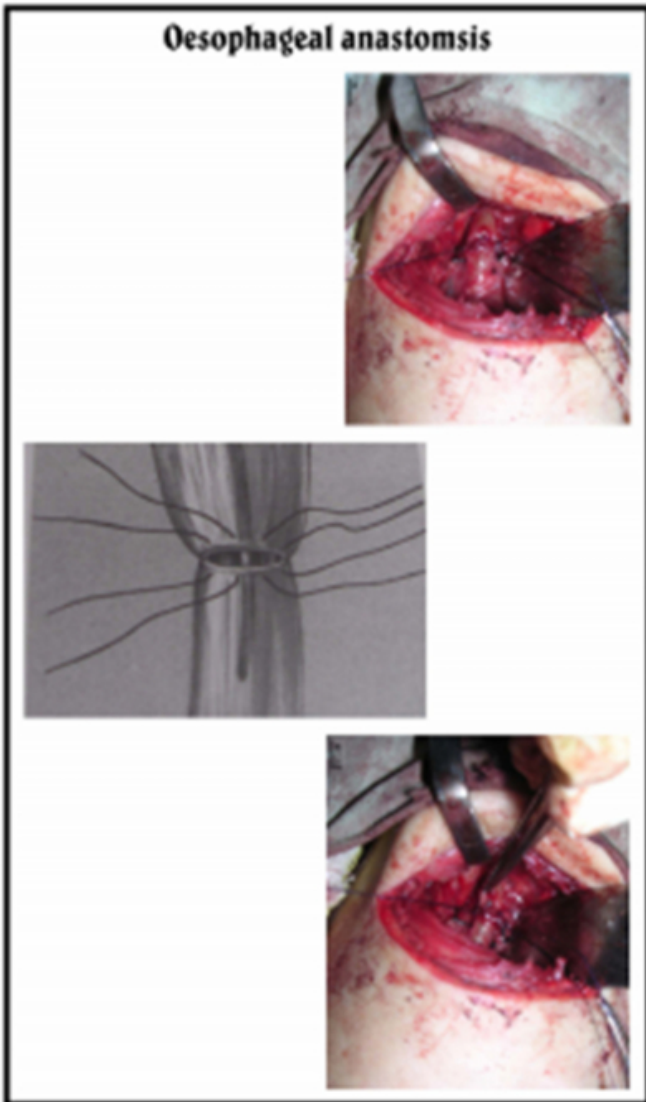
Figure 2



A nasogastric tube No. 8 to 10 was passed from above by the anesthesiologist through the anastomosis, into the stomach. The anterior wall of the oesophageal anastomosis was completed with full-thickness, interrupted, 4-0 PDS suture, completing a single layer and the anastomosis suture line

was checked for a potential leak by instituting 5 to 10ml of saline.

Figure 3



A 12-French chest tube was placed entering in the posterior mediastinal space below the incision. A 3-0 polypropylene suture affixed the tube to the skin at the exit site. The tube was then attached to an underwater sealed closed drainage system.

CLOSURE

The lung was gently expanded and the chest wound was closed using a 2-0 vicryl pericostal suture to oppose the ribs and a running 3-0 vicryl suture to close the divided latissimus dorsi muscle.

The anesthesiologist can help at the closure by pushing down on the infant's right arm and shoulder, taking tension off from the wound. The subcutaneous fascia was

approximated with a continuous running 4-0 vicryl suture and the skin edges were closed with 4.0 black silk verticalae mattsres suture and a dry occlusive dressing was applied.

Figure 4



POSTOPRATIVE CARE

Neonatal intensive care

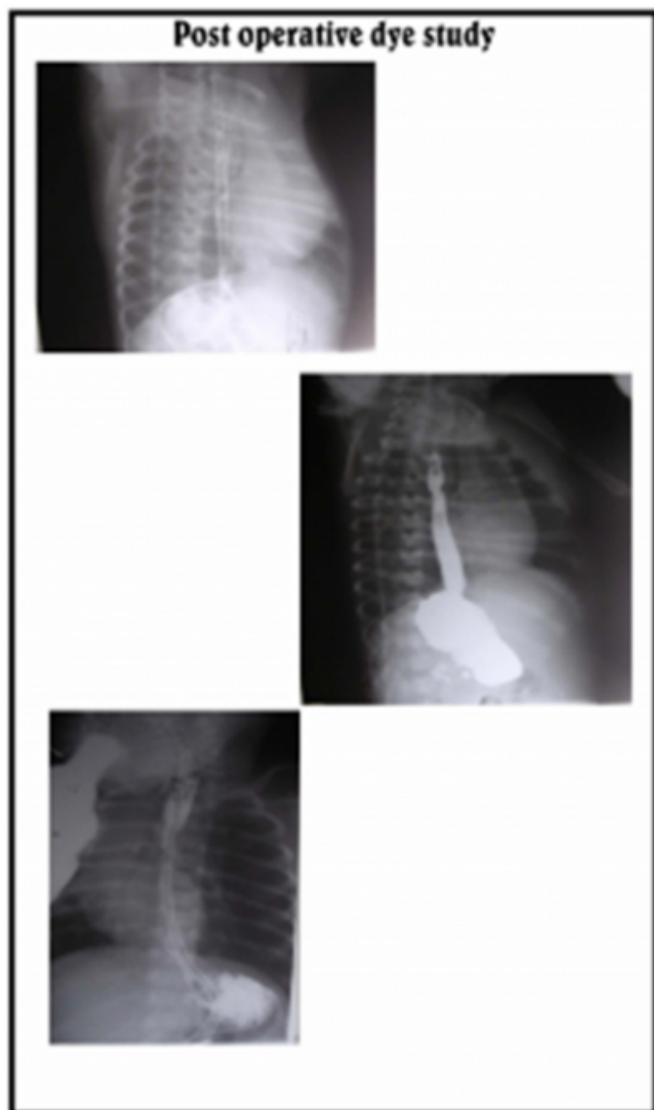
Higher antibiotics

Drain care and removal between 4th to 6th day

Ryle's tube aspiration followed by Ryle's tube feeding when bowel sounds came

Removal of Ryle's tube followed by dye study between 8th and 12th day

Figure 5



Starting oral feeding after normal dye study between 8th and 12th day

Stitch removal in between 10th and 14th day

Most patients require injectable perinorm and buscopan as most have associated gastroesophageal reflux.

Figure 6

Table 1: Postoperative care of 9 surviving patients

Case	Sex	Type	Associated anomalies	Duration of operation in hour	ICD removed (day)	RT feeding (day)	Dye study & RT removal (day)	Oral feeding (day)	Stitch removal A/B/AIK (day)
1	F	C	-	1.30	6	2	10	10	11/13
2	M	C	-	1.40	5	2	8	8	11/13
3	M	C	-	1.30	4	2	8	8	11/13
4	F	C	-	1.40	5	2	10	10	11/13
5	M	C	-	1.30	4	3	9	9	9/11
6	F	C	-	1.30	4	3	8	8	9/11
7	M	C	-	1.40	5	3	10	10	9/11
8	M	C	-	1.30	4	2	8	8	9/11
9	M	C	-	1.30	5	2	8	8	9/11

OBSERVATION AND DISCUSSION

This is a case study of a total of 25 cases of oesophageal atresia with and without TOF repair in GGH and M.P.Shah Medical College, Jamnagar, done from Jan. 2006 to Oct. 2007.

The most common type was found to be type C with around 80% of cases followed by type A with 16% and type E with around 4%. The most frequent associated anomalies found were cardiac ones, among which patent ductus arteriosus was most common.

Figure 7

Table 2: Patient Demographics and associated anomalies

Case	Sex	G.A. (wks)	BBW (g)	Type	Duration of operation in minutes	Anomalias Associated	Survival	Postop. Day of death
1	F	32	1800	C	3	-	No	12
2	F	38	2800	C	2	-	Yes	-
3	M	34	2000	C	2	Imperforate anus	No	12
4	F	34	1700	C	2.30	Dextrocardia	No	2
5	M	39	2600	C	1.30	-	Yes	-
6	M	38	2700	C	1.30	-	Yes	-
7	M	35	1800	A	2.30	Vactni Syndrome	No	2
8	F	38	1800	C	1.30	-	Yes	-
9	M	34	2000	A	240	Double aortic arch	No	3
10	M	36	2400	C	2	Cataract	No	7
11	M	38	3000	C	1.30	-	Yes	-
12	M	32	1800	C	2.20	VSD, ASD, PDA	No	2
13	F	39	2600	C	1.40	-	Yes	-
14	F	34	2200	C	1.30	-	No	12
15	M	35	1600	C	2.10	Dextrocardia	No	2
16	F	34	2000	C	2	Bronchial stenosis	No	1
17	M	35	2500	C	1.50	PDA	No	4

Figure 8

Case	Sex	G.A. (wks)	BBW (g)	Type	Duration of operation (hrs/min)	Associated anomalies	Survival	Postop. day of death
18	F	34	2400	C	2	TOF	No	3
19	F	35	2300	A	1.30	-	No	12
20	M	38	2600	C	1.50	-	Yes	-
21	M	38	3200	C	1.30	-	Yes	-
22	F	35	2400	C	2.10	VSD,PDA	No	2
23	M	40	2900	C	1.30	-	Yes	-
24	M	34	2800	A	2.10	VSD,ASD	No	4
25	M	34	3000	C	2.10	PDA	No	4

Associated anomalies caused intraoperative difficulty as well required special postoperative care. Duration of surgery also increased in cases of TOF with associated anomaly. But survival was 0%.

The most common postoperative complications that occurred in our setup were recurrent pneumonia and, in a small percentage of cases, gastroesophageal reflux and anastomotic stricture.

DISCUSSION

The three priorities in treatment are:

To save life.

To achieve alimentary continuity.

To preserve the oesophagus.

But management of TOF is affected by:

Prematurity

Established pneumonia

Associated anomalies as shown in Table III below.

Such cases should be managed by 100% oxygen despite the risk of retinopathy of prematurity.

Figure 9

Table 3: Survival and average duration of operation

	Cases	Survival	Percentage	Average duration of operation
Associated anomaly	13	0	0	2 hours 10 minutes
No associated anomaly	12	09	75%	1 hr. to 40 minutes

CONCLUSIONS

From our study of 25 cases of tracheoesophageal fistula repair, carried out at the Department of Surgery, M.P.Shah Medical College, Jamnagar, we conclude:

Common type: Oesophageal atresia with distal TOF.

Commonly associated anomaly: Cardiac (patent ductus arteriosus)

Morbidity and mortality both increased if oesophageal atresia with TOF was associated with another abnormality.

The survival rate of operated patients can be improved by

Early diagnosis and timely reference for surgery by a pediatrician

Good peroperative anesthetic care

Perfect knowledge of anatomy and meticulous, skilled dissection within the adequate minimum time by the surgeon

Better postoperative neonatal intensive care

CORRESPONDENCE

Dr. Dhaval L. Udani Senior Resident Doctor Department of General Surgery, M.P.Shah Medical College and G.G. Hospital, Jamnagar. Residential Address: "MATRUCHHANYA" Paras Society 2. Plot no. 26 Near Panchavati Jamnagar - 361 002. Gujarat, India. Cell Phone No.: 9879516191 (0288)2676191 Email address: drudani_udani@yahoo.com

References

1. Human Embryology, Inderbir Singh
2. Surgical Anatomy, Lee McGregor's synopsis, page No.1
3. Diagnostic Radiology, Granger and Allison's, page No. 1201
4. American Academy and Federation of Pediatricians and Surgeons. Feb. 15th, 1999
5. Bailey and Love's Short Practice of Surgery, 24th edition, page No. 994
6. Concise Textbook of Surgery. Somen Das, second edition, page No. 790
7. Mastery of Surgery, fifth edition, vol. II, page No. 795-808
8. Rob and Smith, Operative Surgery - Paediatric
9. Farquharson's Textbook of Operative General Surgery, 9th edition, page No. 312.
10. History of oesophageal atresia. <http://www.tefvates.org>.

Author Information

S.H. Mehta, M.S.

Senior Professor and Laparoscopic Surgeon, Department of General Surgery, M.P.Shah Medical College and G.G. Hospital

M.M. Porecha, M.S.

Associate Professor and Laparoscopic Surgeon, Department of General Surgery, M.P.Shah Medical College and G.G. Hospital

Suraj Wasudeo Nagre

Senior Resident Doctor, Department of General Surgery, M.P.Shah Medical College and G.G. Hospital

Purvi J. Mehta

Senior Assistant Professor, Department of Anaesthesiology, M.P.Shah Medical College and G.G. Hospital

Dhaval Udani

Senior Resident Doctor, Department of General Surgery, M.P.Shah Medical College and G.G. Hospital

Kaushik Patel

Senior Resident Doctor, Department of General Surgery, M.P.Shah Medical College and G.G. Hospital