Section 13: surgical conditions
Oesophageal atresia / tracheoesophageal fistula
Date reviewed: Jan 2010, Dec 2014
Review date: Dec 2017

Neonatology Clinical Guidelines
King Edward Memorial/Princess Margaret Hospitals
Perth Western Australia
Authorisation & review by
Neonatal Coordinating Group

OESOPHAGEAL ATRESIA / TRACHEOESOPHAGEAL FISTULA

Failure of the normal development of the oesophagus and separation of the trachea from the oesophagus results in a spectrum of anomalies that can result in one of the following:

- Oesophageal atresia and distal tracheoesophageal fistula (most common)
- Isolated oesophageal atresia
- Oesophageal atresia with proximal tracheoesophageal fistula
- H-Type trachea-oesophageal fistula without oesophageal atresia

In addition, vertebral, cardiac, GIT, genitourinary and limb malformations may be associated with this condition. Once an oesophageal atresia (OA) or tracheoesophageal fistula (TOF) has been diagnosed, the infant should be examined carefully to exclude further anomalies. (Such as VACTERL, CHARGE association). Genetic studies such as micro array are frequently ordered; these tests should be discussed with either cytogenetics or a geneticist.

An echocardiogram must be performed pre-operatively in every baby to note the position of the aortic arch and detect any cardiac anomalies. Contact cardiologist as soon as oesophageal atresia is diagnosed.

Infants can present with the following signs or symptoms:

- Maternal polyhydramnios.
- Copious oral secretions post delivery.
- Inability to swallow feeds.
- Coughing and choking with feeds.
- Aspiration of feeds/secretions.
- Inability to pass an oro/naso gastric tube.

If an infant presents with signs of oesophageal atresia or a tracheoesophageal fistula, an attempt should be made to **gently** pass a size 10 FG feeding tube. **(A smaller bore tube may curl in the pouch.)** If this is met with resistance, an X-ray should be ordered with the feeding tube in place. The upper pouch ends at approximately Thoracic vertebra 2-4; lower than this requires further investigation, such as a contrast study. If the X-ray is indicative of an OA or a TOF, a Replogle tube should be inserted to prevent aspiration of secretions. Insert the Replogle tube orally until resistance is felt (usually between 8-10cm from lips), then withdraw 0.5cm and secure. Note the length inserted and record in the infants notes. Nurse the infant with the head of the bed elevated. The Replogle tube should be placed on continuous, low suction.

During the preoperative period, an infant may require intubation for various reasons, aspiration, infection, HMD. Positive pressure ventilation can result in escape of air into the stomach via a distal trachea-oesophageal fistula and, if high pressures are required, may result in catastrophic stomach rupture. The early use of surfactant has reduced the requirement for high pressure ventilation. CPAP and bag and mask ventilation are not strictly contra indicated. **Should the infant require emergency intubation, use the least possible ventilator pressure and alert the surgeons and neonatal consultant immediately.** If the infants' condition deteriorates following intubation, perform urgent transillumination and/or X-ray of the

abdomen to rule out pneumoperitoneum. If there is a pneumoperitoneum or a rapid deterioration in the infants' condition, consider emergency needle paracentesis of the abdomen. An urgent surgical consult will facilitate emergency ligation of the fistula and consideration of a gastrostomy.

The pre and post-operative management of the infant is as per general care of the surgical infant. However there are some nursing considerations pertinent to care of the infant with OA/TOF as listed below.

PREOPERATIVE CARE

1. Secure the Replogle tube to prevent movement.
2. Nurse the infant in a head-up position to minimise the risk of aspiration pneumonia and the reflux of acid from the stomach through the fistula.
3. Place the Replogle tube on continuous low pressure suction at 2-5cm H_20. Use the closed disposable suction system if available.
4. To maintain patency of the Replogle tube, flush with 0.5mL of normal saline every 15minutes. Do not leave the syringe attached to the Replogle as this will nullify the suction. Ensure the saline is aspirated back after each flush. Extra flushes may be required if the secretions are thick. Record all flushes on the observation chart (MR489).
5. Remove the Replogle tube once every 8-10hrs and flush thoroughly with saline to ensure optimal patency.
6. Replogle tubes are changed **weekly** unless otherwise indicated.

POSTOPERATIVE CARE

1. On return from theatre, the infant will have a **TRANSANASTOMOTIC TUBE (TAT)** in place. The purpose of this tube is to act as a stent for the repair site, as well as for nasogastric feeds once they commence. The tube is marked with green and yellow striped tape.

UNDER NO CIRCUMSTANCES SHOULD THE TUBE BE REMOVED

WITHOUT THE SURGEONS' PERMISSION.

If the TAT is accidentally removed, do not attempt to reinsert it, and contact the surgeons immediately.

2. Aspirates should be measured, described, and recorded as for any nasogastric tube.
3. If the gap between the oesophageal elements is large, the oesophageal repair may be tight. It may be requested by the surgeon that we nurse the infant in a supine position with the chin tucked onto the chest to reduce tension on the anastomotic site: check the post-operative surgical orders.
4. If the gap has been too large to perform a primary repair, a gastrostomy tube may be inserted to facilitate feeding until the secondary repair can take place. (Note: Gastrostomy tubes are NOT aspirated pre-feed). The Replogle tube will remain in situ, and flushing will proceed as before.
5. The infant may return from theatre with a chest (wound) drain. This is **not** placed on suction unless specifically ordered by the surgeon. Even low pressure suction may cause damage to the newly repaired oesophagus.
6. Any feeds commenced will be via the **TAT** ONLY. A contrast study will be performed approximately 7 days postoperatively to detect any anastomotic leak prior to commencing oral suck feeds.

NO ORAL FEEDS (BOTTLE/BREAST) ARE TO BE

GIVEN UNTIL ORDERED BY THE SURGEON.

7. The head of the bed should be elevated 30 – 45 degrees when the infant commences feeds. Post oesophageal repair, infants may have some degree of oesophageal dysmotility: elevating the head of the bed, and utilising positioning techniques may help to control reflux symptoms.
8. Gastro-esophageal reflux can be a significant problem in some babies. The early use of omeprazole to protect the anastomosis site and reduce any Heart Burn (pain) can be useful.
9. Post op laryngo-malacia is relatively common presenting as a barking cough or respiratory distress making feeding difficult and in the worst cases requiring CPAP.

References

Spitz l. Oesophageal atresia. Orphanet j rare dis. 2007 may 11;2:24.

Boxwell, G. (Ed), (2000). Neonatal intensive care nursing. London: Routledge; Chapter 15, Surgical Aspects; pp 347 - 352

Chambers MA, & Jones, S. (eds).2007. Surgical nursing of children, Edinburgh: Butterworth Heinemann Elsevier, Chapter 9, Neonatal Nursing;

Gomella TL. 2009. Neonatology: management, procedures, on-call problems, diseases and drugs. (6th ed). Lange Clinical Science. Chapter 120 Surgical diseases of the newborn: alimentary tract obstruction; pp 677-681.

Merenstein GB & Gardner SL. 2006. Handbook of neonatal intensive care. 6th ed. St Louis: Mosby Elsevier. Chapter 28, Neonatal Surgery; pp 839 – 841

Maoate K, Myers NA, Beasley SW. Gastric perforation in infants with oesophageal atresia and distal tracheo-oesophageal fistula. Pediatr Surg Int. 1999;15(1):24-7.