Esophageal Replacement in Children; Controversies Tips & Technical Pearls from Experience

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Introduction

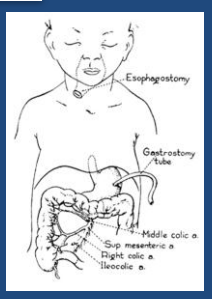
Esophageal replacement in children is needed for conditions like corrosive strictures, long-gap atresia, and congenital stenosis. Common conduits include gastric pull-up, gastric tube, colon, and jejunum, chosen based on anatomy and surgeon expertise. Each has pros and cons, and careful surgery with good postoperative care ensures better outcomes. This study summarizes our 14-year experience, focusing on gastric pull-up cases, complications, and results.

Routes

Most common is transhiatal. Others are retrosternal and subcutaneous (rare).Approach may be laparotomy with blind transhiatal/ retrosternal, thoracoabdominal or combined.

Routes versus conduits:

- **Left colon -** Left transplural or trans hiatal
- **Right colon -** Retrosternal
- **Gastric tubes:**
  - **Antiperistaltic -** Retrosternal or left transplural
  - **Isoperistaltic -** Transplural left.
- **Gastric pull-up -** Tranhiatal or retrosternal
- **Jejunal -** Transhiatal.



Key for Preparation

- Build up nutrition.
- Clear any chest infections
- Barium enema &colon preparation
- Gastric color doppler for vascular anatomy
- Take all lines
- Reserve ventilated bed in PICU

Intra Operative Tips & Tricks

- **Gentle Tissue Handling:**
  Pediatric tissues are fragile — minimize traction to prevent devascularization.
- **Conduit Length:**
  Avoid redundancy (risk of kink) in colon — measure carefully to ensure the conduit reaches the neck without tension.

Transhiatal:

- Most difficult area T3-7
- Do ***dissection by combinition of blunt, bipolar cautry, Shawanchi forcep***,
- Be *careful near aortic arch*
- if difficult then open chest here.
- **Neck dissection easy to do from left side**
- Give curved incision downward and medially -combination of blunt, bipolar cautery,
- ***Do dissection first posterior to esophagus***
- Touch fingers also first posteriorly

Retrosternal Approach:

Challenge is start of dissection in epigastreum in safe plane

Dissection at manubrium sterni

May need wide excision to remove possible compression resulting in dysphagia

Difficulty may at near neck in upper mediastinum lateral

Will be a challenge in future for dilatation as esophagoscopy is usually not possible

Gastric Pull-up:

- **Stomach is pulled up through the tunnel** **applying stay-sutures** to the left and right of the fundus.
- **Avoid twisting** — mark the stomach conduit clearly.
- **Cervical esophagus** is **anastomosed to the highest point on the fundus** of the stomach in a single layer.

Cervical Esophagogastric/Esophagocolic Anastomosis:

Prefer neck anastomosis if possible — cervical leaks are easier to manage than thoracic.

Will result in less reflux. Intra-thoracic anastomosis lead to negative suction pressure.

Vascularity Assessment of Conduit:

Indocyanine green (ICG) fluorescence is ideal (if available) to confirm conduit perfusion.

Alternatively, visual cues: color, bleeding edge, vessel pulsation.

Controversies

Pylorplasty/Pyloromyotomy is Controversial
Retain Feeding jejunostomy or CVP/TPN
Reflux Management
Elective Ventilation controversial

Social Problems

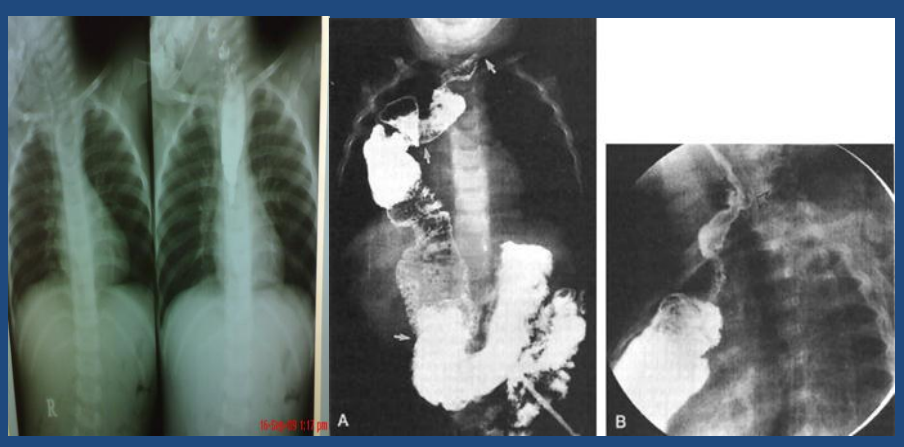
- Suicidal tendency
- Adjustment in society.
- Growth problem
- As worker –Lung function

Recent Advances

- Thoraco-laparascopic
- Robotic surgery
- Tissue engineering

Complications

Immediate: deaths Excessive bleeding & shock. Thoracic duct injuries and nerve palsies Anastomosis leakage Dumping syndrome Late: strictures and stenosis Peptic ulcer-reflux esophagitis Cosmetic deformity Conduit dilatation and elongation Impaired gastric emptying.



Discussion

Esophageal replacement is vital for children with long-gap atresia or severe strictures. Gastric, colonic, and jejunal conduits remain standard options. Advances in technique have improved outcomes, but complications like leaks, strictures, and reflux persist.

Conclusion

Pediatric esophageal replacement provides good long-term results when individualized. Ongoing surgical refinement and multidisciplinary care are key to better outcomes.

References

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