



# **PEDIATRIC SURGERY Update** © **Vol. 30 No. 05 MAY 2008**

## **Enterocutaneous Fistulas**

Enterocutaneous fistulas (ECF) are serious complications associated with high morbidity and mortality. Most ECF occurs after surgery or trauma, while other times Crohn's disease, necrotizing enterocolitis, intra-abdominal abscess, malignant disease and radiotherapy are the culprits. ECF can be classified as low output (less than five ml/kg/day), or high output (greater than five ml/kg/day). Postoperative ECF results from infection and breakdown of an anastomosis, bowel injury, deserosalization of bowel, suture-lines defects, tight sutures with ischemic necrosis, injury to mesenteric vessels, poor hemostasis, adhesive ischemia, volvulus and bowel loop caught in a fascial suture. Postoperative ECF can be also classified as early (those that occur within 48 hours after surgery and are associated to a technical error), and late (occurring 48 hours after the procedure) and associated with low ischemia time. It is vital to identify the source and route of the ECF tract by imaging techniques (UGIS, Barium enema, CT Scan or MRI) and whether the patient has distal obstruction. Management consists of reducing the septic state by adequate draining, hydration, correction of electrolyte imbalances, parenteral antibiotics, somatostatin-14 trial, bowel rest, parenteral nutrition, cutaneous protection, and surgical correction using resection with anastomosis or bypass procedures if the ECF fails to respond to conservative measures.

### **References:**

- 1- Fekete CN, Ricour C, Duhamel JF, Lecoultre C, Pellerin D: Enterocutaneous fistulas of the small bowel in children (25 cases). *J Pediatr Surg.* 13(1):1-4, 1978
- 2- Lévy E, Frileux P, Cugnenc PH, Honiger J, Ollivier JM, Parc R: High-output external fistulae of the small bowel: management with continuous enteral nutrition. *Br J Surg.* 76(7):676-9, 1989
- 3- Falconi M, Pederzoli P: The relevance of gastrointestinal fistulas in clinical practice: a review. *Gut* 49: iv2-iv10, 2002
- 4- Gonzalez-Pinto I, Moreno Gonzalez E: Optimizing the treatment of upper gastrointestinal fistulas. *Gut* 49: iv21-iv28, 2002
- 5- Jamil M, Ahmed U, Sobia H: Role of somatostatin analogues in the management of enterocutaneous fistulae. *J Coll Physicians Surg Pak.* 14(4):237-40, 2004
- 6- Ahmad RR, Fawzy SY: Enterocutaneous fistula. Causes and management. *Saudi Med J.* 28(9):1408-13, 2007

## **Pneumothorax**

Pneumothorax is the presence of air in the pleural cavity. Results from either a tear in the visceral or parietal pleura. Pneumothorax can be spontaneous (primary or secondary), or acquire. The most common cause of primary spontaneous pneumothorax is rupture of an apical subpleural bleb of the lung, usually a thin adolescent male who suddenly develops chest pain and shortness of breath. Secondary spontaneous pneumothorax occurs after

hyaline membrane disease, meconium aspiration, cystic fibrosis, or AIDS. Acquired pneumothorax is more common than spontaneous usually the result of blunt or penetrating trauma, iatrogenic after central line placement, thoracentesis, lung biopsy, barotrauma from mechanical ventilation and laparoscopic procedures. Diagnosis of pneumothorax is done with simple chest films. Complex cystic lung conditions will need chest CT scan for diagnosis. The purpose of management is to evacuate the air in the pleura and expand adequately the lung. Small pneumothorax (less than 20%) can be managed with observation and oxygen therapy. Tube thoracostomy is recommended for pneumothorax larger than 20%. The tube is removed when the lung has expanded completely and the air leak is no longer present for at least 24 hours. Surgical treatment is indicated using video assisted thoracic surgery (VATS) when air leaks continues for more than 72 hours, there is incomplete lung expansion or pneumothorax recurs after adequate management.

**References:**

- 1- Liu HP, Yim AP, Izzat MB, Lin PJ, Chang CH: Thoracoscopic surgery for spontaneous pneumothorax. *World J Surg.* 23(11):1133-6, 1999
- 2- Shaw KS, Prasil P, Nguyen LT, Laberge JM: Pediatric spontaneous pneumothorax. *Semin Pediatr Surg.* 12(1):55-61, 2003
- 3- Ozcan C, McGahren ED, Rodgers BM: Thoracoscopic treatment of spontaneous pneumothorax in children. *J Pediatr Surg.* 38(10):1459-64, 2003
- 4- Choudhary AK, Sellars ME, Wallis C, Cohen G, McHugh K: Primary spontaneous pneumothorax in children: the role of CT in guiding management. *Clin Radiol.* 60(4):508-11, 2005
- 5- Qureshi FG, Sandulache VC, Richardson W, Ergun O, Ford HR, Hackam DJ: Primary vs delayed surgery for spontaneous pneumothorax in children: which is better? *J Pediatr Surg.* 40(1):166-9, 2005
- 6- Butterworth SA, Blair GK, LeBlanc JG, Skarsgard ED: An open and shut case for early VATS treatment of primary spontaneous pneumothorax in children. *Can J Surg.* 50(3):171-4, 2007

**Patent Ductus Arteriosus**

Patent ductus arteriosus (PDA) is a fetal vessel that connects the main pulmonary trunk with the descending aorta distal to the origin of the left subclavian artery. Most term infants have the PDA closed by three weeks of age, while premature takes longer to close. In terms infants, PDA can lead to death from congestive heart failure (tachypnea, tachycardia, poor feeding, slow weight gain and recurrent pulmonary infections). In premature, the PDA can lead to sepsis, renal failure, necrotizing enterocolitis, metabolic acidosis and death. PDA murmur is systolic. Indications for closure include congestive heart failure, bacterial endocarditis, failure to close during the first year of life. In premature the PDA can be medically closed with pharmacologic indomethacin therapy (prostaglandin inhibition). If medical therapy fails surgical closure is needed. Surgical closure (division is preferred for term and older children, while ligation is reserved for premature) can be done through a left lateral thoracotomy, a medial sternotomy or from inside the pulmonary artery. Other alternatives include percutaneous catheter closure or thoracoscopic closure of the PDA. Some postoperative complications include bleeding, damage to phrenic, vagus or recurrent laryngeal nerve and chylothorax. In general prognosis is good.

**References:**

- 1- Little DC, Pratt TC, Blalock SE, Krauss DR, Cooney DR, Custer MD: Patent ductus arteriosus in micropreemies and full-term infants: the relative merits of surgical ligation versus indomethacin treatment. *J Pediatr Surg.* 38(3):492-6, 2003
  - 2- Wyllie J: Treatment of patent ductus arteriosus. *Semin Neonatol.* 8(6):425-32, 2003
  - 3- Van Overmeire B, Chemtob S: The pharmacologic closure of the patent ductus arteriosus. *Semin Fetal Neonatal Med.* 10(2):177-84, 2005
  - 4- Arora R: Transcatheter closure of patent ductus arteriosus. *Expert Rev Cardiovasc Ther.* 3(5):865-74, 2005
  - 5- Hermes-DeSantis ER, Clyman RI: Patent ductus arteriosus: pathophysiology and management. *J Perinatol.* 26 Suppl 1:S14-8, 2006
  - 6- Herrera C, Holberton J, Davis P: Prolonged versus short course of indomethacin for the treatment of patent ductus arteriosus in preterm infants. *Cochrane Database Syst Rev.* 18;(2):CD003480, 2007
- 

\* Edited by: **Humberto Lugo-Vicente, MD, FACS, FAAP**

Professor /Academic Director of Pediatric Surgery, University of Puerto Rico - School of Medicine,  
Rio Piedras, Puerto Rico.

Address: P.O. Box 10426, Caparra Heights Station, San Juan, Puerto Rico USA 00922-0426.

Tel (787)-786-3495 Fax (787)-720-6103 E-mail: [titolugo@coqui.net](mailto:titolugo@coqui.net)

Internet: <http://home.coqui.net/titolugo>

© *PSU* 1993-2008  
ISSN 1089-7739