GERD in Children with an Underlying Structural Anomaly

Scope of the Problem

Congenital malformations of the foregut can have a serious and long lasting effect on a child's ability to feed. The anterior part of the embryonic intestinal tract develops into the esophagus, lungs, stomach, duodenum and associated organs (liver and pancreas); problems may occur at any of these levels. These problems are often accompanied by protracted dysmotility, which affects swallowing, gastric emptying and intestinal transit. Gastroesophageal reflux disease in this population of patients is a pervasive and challenging problem requiring early identification and a wide range of interventions (both medical and surgical).

The most common anomalies involving the esophagus include:

- esophageal atresia
- tracheo-esophageal fistula with or without esophageal atresia
- esophageal stenosis
- webs and rings

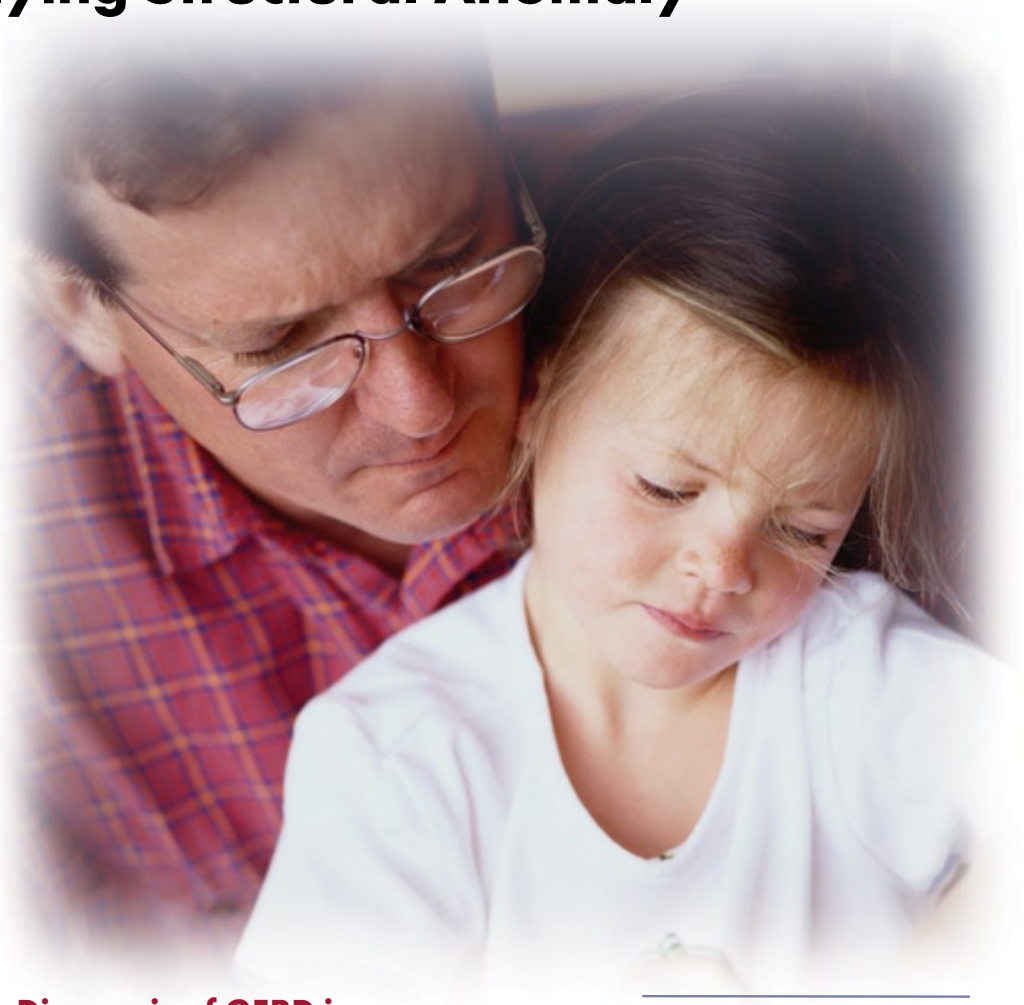
Anomalies of the diaphragm (hernia) and abdominal wall defects (omphalocele and gastroschisis) also result in chronic functional foregut dysfunction promoting reflux.

Signs and Symptoms of Esophageal Structural Anomalies

Signs of the underlying anomaly are usually present at birth, and sometimes even prenatally when the condition is suspected in the presence of polyhydramnios or abnormal ultrasound findings.

Common manifestations include:

- Increased secretions
- Inability to pass a nasogastric tube into the stomach
- Choking with feedings
- Vomiting
- Recurrent pneumonia
- Reactive airways
- Feeding difficulties



Diagnosis of GERD in Children with an Underlying Structural Anomaly

Careful observation and the patient's clinical history often provide sufficient information to make a diagnosis of GERD. An associated anomaly should be suspected in the presence of additional symptoms including forceful vomiting, irritability, feeding difficulties, choking, and neck arching. Coughing during feeds may be indicative of aspiration. Dysphagia and food impaction can be symptoms of an esophageal stricture or web, while bilious vomiting can point to deranged gastrointestinal motility or frank obstruction.

Specific investigations are often required to confirm the diagnosis of GERD with an associated structural anomaly. These include:

- **Barium contrast study** to assess esophageal peristalsis and to test for the

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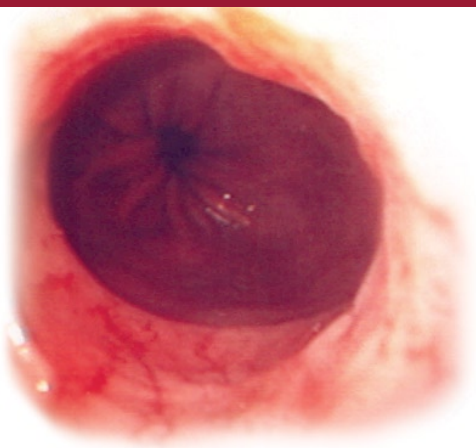

FIGURE 1 *- Endoscopic picture of the distal esophagus in a 6 yr. old with a history of esophageal atresia repaired at birth and two years of therapy with moderate dose H2RA medication for suspected GERD. Erosive esophagitis and a large hiatal hernia are present in this view.*

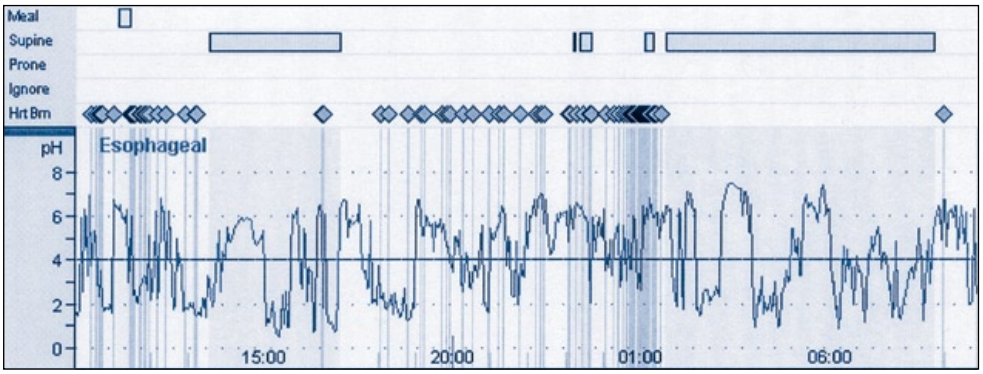

FIGURE 2 *– A 24 hour pH study from the same patient as in Figure 1, showing severe symptomatic reflux throughout the day and night. Over 200 episodes of reflux were documented with a pH less than 4.0 for 27% of the total time of the study. There was a 90% association between reflux episodes and symptoms of pain and heartburn.*

presence of strictures, webs, TE fistulas, hiatal hernias, gastric outlet obstruction, or intestinal dilatation.

- **Upper GI endoscopy**, to provide visual and histological evidence of esophagitis, stenoses, or strictures.
- **Esophageal pH monitoring** to quantify acid exposure, and to assess symptom correlation with reflux events.
- **Technetium labeled liquid** and solid meals to determine gastric emptying, and
- **Bronchoscopy with broncho-alveolar lavage** to document aspiration in selected cases.

Treatment Options

Management of the child with reflux disease associated with structural anomalies focuses on prevention of peptic-induced damage and frequently continues for years. In the case of esophageal atresia, for example, the risk of recurrent stricture is worsened by GERD, and requires intensive acid suppression. (Figure1) Similarly, esophagitis resulting from GERD in the presence of gastric and intestinal dysmotility is more difficult to control. (Figure 2) This type of esophagitis is best managed in close collaboration with the pediatric surgery team and other specialists involved in the child's care, including a pulmonologist, otolaryngologist, and nutrition support team.

The surgical options offered to children with complex anomalies might include fundoplication to protect against chronic reflux, placement of a feeding gastrostomy or jejunostomy, and intestinal tapering operations to address dilated bowel.

Physician Notes

Prognosis

Symptoms and complications of gastroesophageal reflux can be successfully managed in the majority of children born with congenital anomalies. Safe and effective medications are available to control gastric acidity and minimize peptic damage. Histamine2- receptor antagonists (ranitidine, famotidine) and proton pump inhibitors (pantoprazole, omeprazole) both have excellent safety records and are available in powder or liquid forms suitable for use in children. The challenge of managing these children is best addressed by a team approach in which the primary care physician plays a key role as the coordinator of care.

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