Introduction

The diaphragm is a dome-shaped, musculoaponeurotic structure separating the thoracic and peritoneal cavities. This constantly active striated muscle increases the volume of the thoracic cavity with contraction and reduces thoracic volume on relaxation. ***(Christine et al., 2007).***

The topic of congenital diaphragmatic hernia (CDH) has frequently appeared in the medical literature since its first description in the early 18th century. Initial theories about the pathophysiology of this condition centered on the presence of the herniated viscera within the chest and the need for its prompt reduction. ***(Steinhorn.R.H, 2009).***

Congenital diaphragmatic hernia is defined as a protrusion of abdominal viscera into the thorax through an abnormal opening or defect that is present at birth. In some cases, this protrusion is covered by a membranous sac. In contrast, diaphragmatic eventrations are extreme elevations, rather than protrusions, of part of the diaphragm that is often atrophic and abnormally thin. ***(Arensman and Bambini, 2000).***

The incidence of congenital diaphragmatic hernia (CDH) has been reported as 1 in 3000–5000 live births, however, in population studies (including cases resulting in premature terminations, still births and neonatal deaths prior to transfer to tertiary centers) the incidence approaches 1 in 2000. ***(Robinson and Fitzgerald 2007).***

Infants with congenital diaphragmatic hernia most commonly present with respiratory distress and cyanosis in the first minutes or hours of life, although a later presentation is possible. The respiratory distress can be severe, requiring aggressive resuscitative measures.***(Steinhorn.R.H, 2009).***

With the development of newer treatment techniques to include HFOV and more sophisticated extracorporeal oxygenation equipment, the mortality rate of CDH has continually decreased.However, long-term morbidity includes such entities as gastroesophageal reflux disease (GERD), neurologic and development disorders, and musculoskeletal disorders.***(Schwartz and Johnson,2009).***

The 3 basic types of CDH are posterolateral Bochdalek hernia (occurring in utero at approximately 6 weeks of gestation), anterior Morgagni hernia, and hiatus hernia. Left-sided Bochdalek hernia is seen in approximately 90% of cases. The major problem in a Bochdalek hernia is the posterolateral defect of the diaphragm, which results in either failure of the pleuroperitoneal folds to develop or improper or absent migration of the diaphragmatic musculature. Bilateral Bochdalek hernias are rare.Morgagni hernia is a less common form of CDH, occurring in only 5-10% of cases. This hernia occurs in the anterior midline through the sternocostal hiatus of the diaphragm, with 90% of cases occurring on the right side.A congenital hiatus hernia is very rare in neonates. In this form, herniation of the stomach occurs through the esophageal hiatus. ***(Hekmatnia.A, 2008).***

Aggressive respiratory support is often needed in children with CDH. This will include rapid endotracheal intubation, sedation, and possibly paralysis. Conventional mechanical ventilation, high frequency oscillation ventilation (HFOV), and extracorporeal membrane oxygenation (ECMO) are the three main strategies to support respiratory failure in the newborn with CDH. The goals are to maintain oxygenation without inducing barotrauma. The first modality to be used is conventional ventilation. ***(Coran.A, 2007).***

The surgical approach to the repair of CDH has changed dramatically in the past 25 years. Historically, neonates with CDH were brought to the operating room almost immediately after birth to emergently relieve the compressed lung by reducing the intra-abdominal contents from the chest. With improved understanding of the pathophysiology of CDH, repair of CDH is no longer considered a surgical emergency. ***(Tsao & Kevin,2009)***.

Any operation or incision involving the diaphragm requires a thorough knowledge of its anatomy. The diaphragm consists of a peripheral muscular zone that inserts into a central aponeurotic tendon. The peripheral portion of the diaphragm originates circumferentially from four points: sternum, ribs, anterior muscular, and posterior muscular. ***(Christine et al., 2007).***

The timing of diaphragm repair is controversial. In patients that are not placed on ECMO, most surgeons perform repair once the hemodynamic status has been optimized. In neonates that are on bypass, some surgeons perform early repair on bypass; others wait until the infant's lungs are fully recovered, repair the diaphragm, and discontinue bypass within hours of surgery. Still others repair the diaphragm only after the infant is off bypass. ***(Newman.K.D, 2009).***

With careful patient selection, minimally invasive repairs have been successfully performed, both laparoscopically and thoracoscopically. This approach has been utilized with primary repair as well as prosthetic patch closure of the CDH. Laparoscopic and thoracoscopic operations are feasible without a demonstrable advantage to either. However, patient selection remains the main determinant of success. ***(Tsao & Kevin,2009)***