

Right-Sided Congenital Diaphragmatic Hernias: Characterization, Utility of Prenatal Imaging Predictors and Outcomes by Repair Techniques at a Single Institution

Abstract

Background: Right-sided congenital diaphragmatic hernias (R-CDH) account for approximately 10% of CDH cases. Consequently, little has been reported on prenatal predictors, management, and overall outcomes.

Purpose: To characterize patients with R-CDH, analyze potential thresholds in prenatal imaging predictors for outcomes in R-CDH and investigate differences in outcomes by R-CDH repair technique.

Methods: Given the infrequency of R-CDH cases, we conducted a retrospective review of all neonates diagnosed with a R-CDH at a single institution from 2010-2024. Among those diagnosed *in utero*, prenatal ultrasound and MRI were correlated with our primary outcome, survival. Secondary outcomes included need for extracorporeal membrane oxygenation (ECMO), duration on mechanical ventilation, length of hospital stay, surgical complications. We used appropriate statistical methods to compare outcomes between repair techniques, prosthetic patch versus muscle flap.

Results: During the study period, a total of 32 neonates with a R-CDH were cared for at our institution. Twenty-three survived, with an overall survival of 72%. Seventeen (53%) were diagnosed prenatally. There were no significant thresholds in imaging values that predicted mortality in this population. All but one neonate diagnosed prenatally required ECMO. Nine (28%) underwent primary repair. One neonate who underwent a primary repair developed a recurrence. Among the remaining 23, nine (28%) were repaired with a patch, and 14 (44%) with a muscle flap. Mortality, need for ECMO, days of mechanical ventilation and ECMO, and length of stay were similar between patch and flap repair groups. Those repaired with a patch required a reoperation for bleeding complications more often than those repaired with a muscle flap [5 (56%) v 1 (7%), $p=0.02$].

Conclusion/Significance: Our large single center review of R-CDH suggest that prenatal predictors of survival are inaccurate. Although, most neonates diagnosed with R-CDH prenatally required cannulation to ECMO. These findings not only provide guidance for prenatal counseling but suggest that R-CDH should deliver at a quaternary neonatal intensive care unit with ECMO capability. Additionally, though there was a statistically significant difference in bleeding complications between repair techniques this was limited by sample size and unlikely to be clinically meaningful. Patches and flaps were overall comparable.