

Neonatal imaging

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2A SPECTRUM AND SUBDIVISION OF CAUSES OF NEWBORN RESPIRATORY DISTRESS

Newborn respiratory distress can be caused by a large number of different entities, including intrapulmonary and intrathoracic as well as extrathoracic lesions (Table 2.1). This chapter will focus predominantly on the intrapulmonary entities.

The intrapulmonary causes of neonatal respiratory distress are readily subdivided based on their tendency to affect premature versus full-term infants or both, as well as the likelihood that they will produce symmetric or asymmetric radiographic changes (Table 2.2). The asymmetric lesions are often associated with mediastinal shift and are more likely to require surgical rather than medical management. Under- or over-aeration of the lung as well as specific pulmonary patterns of abnormality are additional useful differentiating features for the medical conditions (Table 2.3).

Table 2.1 Causes of neonatal respiratory distress

1. Intrapulmonary abnormality	<ul style="list-style-type: none"> — Medical — Surgical
2. Intrathoracic extrapulmonary	<ul style="list-style-type: none"> Cardiac – congenital or acquired Vascular enlargement, rings/slings Airway abnormality Tracheoesophageal fistula Mediastinal mass Congenital diaphragmatic hernia
3. Extrathoracic	<ul style="list-style-type: none"> Upper airway obstruction Musculoskeletal abnormality Abdominal pathology Central nervous system lesions Metabolic/hematological disorders

Systematic evaluation of newborn chest radiographs

Systematic evaluation of newborn chest radiographs includes assessment of the placement of tubes and catheters (Figures 2.1–2.3) as well as the overall chest configuration and aeration, appearance of the heart and vessels, pleura, musculoskeletal and abdominal structures and presence of mediastinal shift (Figures 2.4, 2.5) before reviewing the details of the pattern and symmetry of pulmonary abnormality. The radiographic appearance should be correlated with clinical history and findings.

Surfactant deficiency disease

Surfactant deficiency disease (SDD; also variously called hyaline membrane disease or respiratory distress syndrome) occurs in premature newborn infants of less than 36 weeks gestation because of absence or immaturity of pulmonary

Table 2.2 Intrapulmonary abnormalities in newborn infants

	Preterm	Term	Both
Symmetric	Surfactant deficiency disease	Transient tachypnea of the newborn	Lymphangiectasia Bilateral lung hypoplasia
Asymmetric	Pulmonary hemorrhage	Fetal aspiration	Pneumonia Atelectasis Airleak Unilateral agenesis/hypoplasia Hydrothorax Bronchopulmonary malformation Tumor