Diaphragmatic hernia is one of the important surgical emergencies in neonates because of the life-threatening cardio-respiratory embarrassment frequently associated with it. The condition is more often diagnosed now-a-days than before because of the alertness on the part of the physician attending the baby. The first description of diaphragmatic hernia was given by Ambroise Paré in 1575 and it was in an adult.

In the early quarter of this century diaphragmatic hernia was treated conservatively and the mortality rate was very high. In 1931 Hedblom reviewed the literature and noted that immediate neonatal mortality is 75% with conservative treatment. Results have improved today because of early diagnosis, proper oxygenation, and immediate surgical intervention under cover of proper anaesthesia.

Eight cases were referred to one of us (S.K.C.) for surgical correction during the last 5 years (1966-70) with initial diagnosis of diaphragmatic hernia. Two of these cases were subsequently proved to have lesions other than diaphragmatic hernia. In the remaining six cases, the diagnosis of diaphragmatic hernia was established at operation.

Embryology, Anatomy and Pathology

The diaphragm is formed as a result of fusion of several component parts during the early development of the human embryo. This is completed by the ninth week of intra-uterine life. At this time the gastro-intestinal tract also undergoes its major development e.g. rotation and returning of the gut into the abdominal cavity. If a defect exists at this stage the returning intestines may pass immediately into the thoracic cavity giving rise to diaphragmatic hernia.

The defect in the diaphragm may be of the following common types:

(a) Bochdalek hernia (postero-lateral type) which may be right or left;
(b) Retrosternal hernia of Morgagni;
(c) Hiatus hernia—different types.

Only the first or Bochdalek variety manifests itself clinically in the neonatal period. In the present series 2 were found on the right and 4 on the left side.

Incidence

It is extremely difficult to estimate the incidence of congenital diaphragmatic hernia. It appears from the survey of Butler and Claireaux (1962) that the true incidence of infants born with diaphragmatic hernia is in the neighbourhood of 1 in 1200 still births and 1 in 4000 live births. This disparity in the
figure shows that a majority of the children with diaphragmatic hernia never reach a surgical centre at all but are either stillborn or die shortly after birth. This is also evident from the fact that a group study by nine surgeons in different hospitals in a city like Calcutta could only record 19 cases of whom only 5 were neonates during the period of 1962 to 1969 (Personal communication by Dr. Karai). However, eight cases were referred to us as diaphragmatic hernia during the period 1966 to 1970.

Clinical Symptomatology and Diagnosis

The clinical picture of congenital diaphragmatic hernia presented in this report were referable mainly to the cardio-respiratory system. All the cases that were referred as diaphragmatic hernia presented with cyanosis of varied degree except in one where gastrointestinal symptoms were the predominant feature. This case was subsequently proved to be a case of congenital cystic disease of the lung. Cyanosis was present or noticed just after birth in 4 cases. Respiration was hurried in the range of 60–100/min. (Normal 30–60/min). In most cases there was definite displacement of the apex beat to the opposite side of the lesion, a scaphoid abdomen, a hyper-resonant chest wall and gurgling bowel sounds on the affected side of the chest.

Diagnosis was ultimately confirmed by radiological examination, antero-posterior and lateral films having been taken. Classical findings were gas-filled loops of intestines with often stomach, spleen or liver in a hemithorax with shifting of the mediastinum towards the opposite side and collapse of the ipsi- and contralateral lung (Fig. 1). the routine use of contrast medium was thought unnecessary for diagnosis in the majority of cases and may be dangerous because of aspiration in such an ill baby. However, two of our cases proved to be congenital cystic disease of the lung; contrast medium was of great help in diagnosing one such case; in the other the diagnosis was established only after operation.

Treatment

Pre-operative management

Diaphragmatic hernia in the neonatal period is an emergency of the first order and delay of every minute may be fatal. As soon as the diagnosis is made adequate ventilation is essential. Nursing the baby propped up and lying on the affected side often improves ventilation and relieves the distress to some extent. A nasogastric catheter is passed and the stomach deflated—the end of the tube is kept open to prevent gaseous distention of the bowel by swallowed air. This improves the respiratory capacity. Oxygen by tent or incubator and if necessary by endotracheal intubation is essential to relieve dyspnoea and cyanosis. However, endotracheal intubation is not without danger. In two of our cases endotracheal intubation resulted in cyanosis and apnoea due to the passage of the tube beyond the carina into the bronchus of the collapsed lung and things improved only after the tube was withdrawn partially. In one of our