CLINICAL DEPARTMENT

RESPIRATORY OBSTRUCTION RESULTING IN DEATH

CASE REPORT WITH NECROPSY FINDINGS *

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History.—J. McC, a white boy, aged 4 months, whose family history was negative, had had rhinitis two or three times. He was breast fed for three months, then he was fed on whole milk mixtures until his death. He did not have any gastro-intestinal disturbances. He was a first born child. The labor had been normal. His present illness dated from the day after his birth when his mother noticed that his breathing was more noisy than normal. He was not cyanotic and did not seem to be in distress. This noisy breathing became more and more pronounced. He had been cyanotic only once, for about five minutes, when he seemed to strangle. His appetite was good. Breathing was always more difficult after a meal or when crying.

Physical Examination.—This showed a malnourished, white, male infant, lying quietly in bed; no distress; sensorium clear; skin rather dry and hanging loosely so that it can be picked up in folds. Tissue turgor is poor. There is no enlargement of lymph nodes; no cyanosis.

Head: Anterior fontanel is of normal size, soft and pulsating; posterior fontanel is closed. Sutures are normal. *Eyes:* Pupils react to light; conjunctivae are pale; sclerae clear. *Nasal passages* are clear. *Mouth:* Tongue rather dry; gums and buccal mucous membrane are normal. No abnormality of the pharynx can be seen or felt. Laryngoscopic examination was not made. *Ears* are normal.

Chest: Well formed; not at all "barrel-shaped;" no abnormality of bony structure. Both inspiration and expiration are labored and noisy; no difference in duration of the two. On inspiration the accessory muscles of respiration are used to their full extent and the ensiform is greatly depressed. There is a loud inspiratory and expiratory stridor. This stridor is present at all times, but is much more pronounced for from one-half to one hour after feeding or when the child is crying. There is no cough.

Lungs: Percussion is normal, except over the vertebrae where dullness extends to the sixth dorsal vertebra. Breath sounds are normal, except over the area of dullness in the back, where they are harsh. No râles heard anywhere.

Heart: Normal to percussion and auscultation.

Abdomen: Soft and tympanitic throughout; no masses or tenderness. Liver is palpated 2 cm. below the costal margin in the mammary line. Spleen is not palpable. *Genitalia:* Normal. *Extremities:* Muscles wasted; little or no subcutaneous fat. *Reflexes:* Normal.

Roentgenograms of chest, taken at intervals of about two weeks, show no abnormality.

Pirquet Test: Twice negative. *Wassermann Test:* Negative.

Diagnosis.—Enlarged thymus.

Treatment.—The baby was given roentgen-ray applications at one week intervals for four weeks. For forty-eight hours after each treatment his con-

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dition was decidedly worse, the stridor being more pronounced and the breathing more difficult, and he was slightly cyanotic. He then returned to his previous condition. He was not benefited by the roentgen-ray treatment.

The baby was fed on a 10 to 20 whole milk mixture, 5 ounces, six feedings, made up to 6 per cent. sugar with Karo corn syrup. He never had any gastrointestinal disturbance. At times he had great difficulty in swallowing his food and had to be fed with a stomach tube. The first time a stomach tube was used (No. 22 soft rubber catheter) the respirations were completely blocked and no air could pass in or out. He became cyanotic and the tube had to be withdrawn immediately. Later a smaller tube (No. 15) was used, and while it always increased the dyspnea it was possible to feed the patient in this way. The stridor was present at all times and was both inspiratory

Roentgenogram of chest with negative findings.

and expiratory. It was much worse when he was excited or after being fed, and at these times the stridor could easily be heard 75 feet away.

About one week before his death the respiratory difficulty became worse. He was now slightly cyanotic all the time. As he was more comfortable in a semirecumbent posture, he was kept propped up in this position night and day. Each feeding was an ordeal. He could not swallow the milk without aspirating some of it and having a violent coughing spell. When the small catheter was passed into his stomach, the respirations were dangerously obstructed. About forty-eight hours before his death a roentgen-ray treatment was given and shortly after this, his symptoms became greatly exaggerated and continued so until his death.

REPORT OF NECROPSY (DR. GRAVES)

Necropsy six hours after death. Body length, 63 cm. Age, 4½ months. Body is that of fairly developed, poorly nourished, white, male child. Moderate postmortem lividity in dependent portions. Rigor mortis and edema absent. Pupils equal, regular, 3 mm. in diameter. Teeth not erupted. Anterior fontanel not closed. Skin wrinkled and pale with very little subcutaneous tissue. Bones prominent and spaces sunken everywhere. Axillary glands barely palpable. The peritoneal, pericardial and pleural cavities are normal. All organs are normal. The posterior portions of the lungs are congested. The genital organs are infantile.

The thymus in situ is 50 mm. long and 35 mm. wide. Its upper portion lies 10 mm. above the sternoclavicular joint. It is roughly triangular shaped and is not remarkable except that the larger portion lies cephalic and just underneath the upper portion of the sternum in the bony inlet. Weight, 3 gm. (correct weight).

The necropsy revealed nothing remarkable except malnutrition and the unusual shape and location of the thymus. As compared with the appearance in other children examined postmortem previously and subsequently, the thymus appeared to be higher than usual and presented the larger extremity cephalad instead of caudad.

DISCUSSION

(Dr. Bruce)

The history of stridor, beginning soon after birth and continuing uninterruptedly until death, would rule out any cause which would produce spasm of the laryngeal muscles, such as spasmophilia or croup. These conditions are practically never seen in infants of this age.

There is a great deal in this case to suggest congenital laryngeal stridor; i. e., it was noticed soon after birth and continued unabated until the end. However, there are points which make this diagnosis impossible. In the first place, death in these cases is, so far as I know, always caused by intercurrent disease or respiratory infection, which was not present in the case under discussion. In the second place, the stridor of congenital laryngeal stridor is always inspiratory, whereas the stridor in this case was both inspiratory and expiratory and if anything expiration was a little louder than inspiration.

The postmortem appearance of the larynx was normal and there certainly was no malformation present.

From the positive D'Espine sign, I had expected to find tuberculous glands about the hilus or an enlarged thymus. There were no enlarged or tuberculous glands. The shape and position of the thymus are worthy of consideration. It was roughly diamond shaped and its greatest diameter lay in the bony thoracic inlet. The diameter of the inlet was not measured, but it takes a very small object to block it up and occlude the structures that pass through it. It seems to me that the fact that, when a No. 22 soft rubber catheter was passed through the esophagus into the stomach it completely occluded respiration, is evidence that the trouble lay in the superior thoracic inlet, as this is the only point at which the esophagus and trachea pass through an inflexible

medium. I have passed a No. 22 catheter on many other babies of the same age and never observed respiratory distress in any other case. It seems logical to believe, therefore, that even a 3 gm. thymus, if located in this narrow aperture, could cause tracheal obstruction. While it is impossible to state definitely that this was the cause of death, I think it is the most likely explanation of the case.