CASE REPORT

Eventratio Diaphragmatica.

by

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Introduction

A diaphragmatic eventration is a displacement of abdominal structures into the thoracic cavity, due to weakness and balooning of the diaphragm (Nelson, 1969). In several aspects it has similarities with a diaphragmatic hernia, i.e. the space occupying effects to the lungs, and the sequences of it. An eventration can be divided in 2 groups, the congenital eventration, where the diaphragm is devoid of mucles and only a membrane is separating the abdominal from the pleural cavity; and the acquired one where the phrenic nerve is damaged, usually due to birth injury; but it can also be caused by any other trauma (Bernado et al., 1961; Bisono et al., 1970) such as surgical procedures at the time of thoracotomy, the so called iatrogenic eventration (Jewett et al., 1964).

Bisgard (1947) stated that an eventration of the diaphragm may be defined as an abnormally high or elevated position of one leaf of the intact diaphragm, as a result of paralysis, aplasia or atrophy of varying degree of the muscle fibres (Cited by Carter et al., 1962).

Avnet (1962) reported 2 cases of congenital bilateral eventration of the diaphragm. A case of bilateral total diaphragmatic eventration was reported earlier by Reed and Borden, in the mid eighteenth century (Avnet, 1962).

Christensen (1959) stated that it is sometimes difficult to differentiate between a diaphragmatic hernia and an eventration before operation, and when acute symptoms are present needing surgical intervention the distinction between these two le-

Fig. 1: *X foto (AP) of the patient, May 5, 1971.*

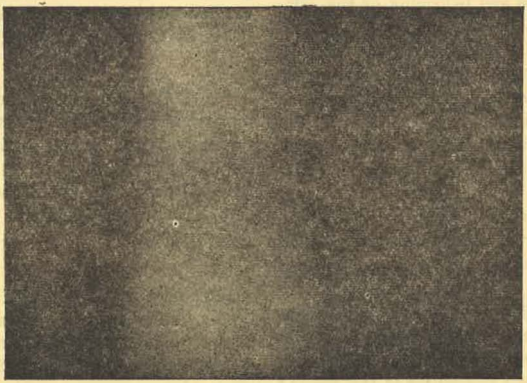

Fig. 2: *X foto (lateral), May 6, 1971.*

sions is not necessary (cited by Carter et al., 1962).

Carter et al. (1962) reported 66 cases of hernia and eventration of the diaphragm in a 13-year collection of surgical cases. They are of the opinion that, when there is a significant space occupying lesion of the chest, any distinction between these 2 conditions mentioned above before operation is not important. The space occupying lesion in the chest should be corrected, either by repair of the hernia or by plication of the eventrated leaf of the diaphragm (Carter et al., 1962).

Since an eventration may be asymptomatic, the lesion is sometimes discovered rontgenologically only by chance or found at autopsy (Nelson, 1969). Reported cases of this kind are very rare.

Diaphragmatic hernias are in close relation with eventrations, as regard the development and treatment; a brief description will also be given about hernias (Butler et al., 1962; Gross, 1964; Spalteholz). A hernia diaphragmatica is a displacement or protrusion of abdominal viscera through the diaphragm. Etiologically it is divided in the congenital and the acquired form.

The acquired one is most often due to trauma. In the congenital group a distinction can be made of 3 types, according to their anatomic localisation:

1. postero-lateral, through the foramen Bochdalek,
2. retrosternal, through the foramen Morgagni,
3. through the hiatus oesophagus.

These hernias may have a sac or not (Gross, 1964; Spalteholz).

Symptoms related to the hernias are mostly acute, either due to the space occupying effects involving the respiratory and cardiovascular function or to an incarceration leading to disturbances in the intestinal tract (Bernado et al., 1961).

However, an eventration may also give rise to similar symptoms.

Case Report

R.E., a 6½-month-old Indonesian girl was admitted on May 5, 1971. She was sent by a G.P. with the diagnosis of bronchopneumonia.

History: A week prior to admission the baby started to cough. She was brought to a G.P. who prescribed medicine, but the patient did not improve. On the second day her body temperature rose and she became dyspneic. On the 7th day of her illness she was sent to a pediatrician for consultation, who referred her to the Pediatric Department of the Airlangga University.

The baby, a firstborn, was delivered full term, assisted by a midwife. The membranes ruptured 1½ hours prior to delivery. The second phase was aided by the Kristeller method. The baby cried immediately

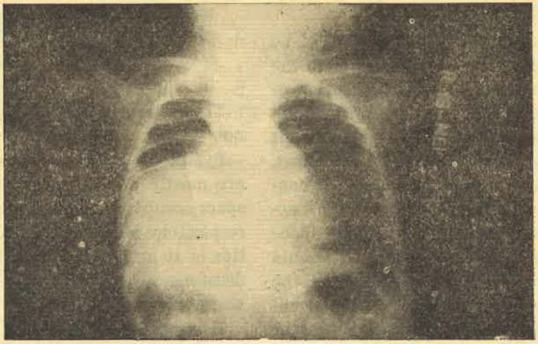

Fig. 3: *X foto (AP), May 18, 1971.*

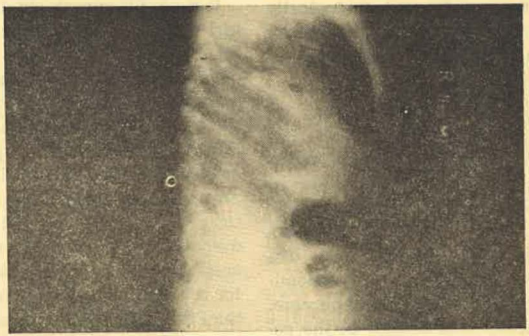

Fig. 4: *X foto (lateral) May 18, 1971.*

after birth. No pareses or paralyses were detected at that moment. Thereafter the child was doing well, and she never showed dyspneic or cyanotic attacks until her present illness.

She was breastfed until the 4th month, after which a milk formula was supplemented. A smallpox vaccination had been given.

On examination we found a well nourished baby with a body weight of 8.100 grams, compos mentis, rather anemic and very dyspneic. Respiratory movements were shallow with a rate of 60 per minute, the rectal temperature was 38,5°C.

She had rhinitis and her throat was hyperemic. Wheezing and rales were heard on the left side of the thorax but over the right lower portion of the lungs breath sounds were diminished and on percussion a dullness was detected over this area. The heart showed no peculiarities. The liver and spleen were not palpable.

A rontgenogram of the chest on the day of admission (May 5, 1971) showed an opacity at the right top and right base and a bronchopneumonic picture was seen in the remaining portions of the lungs (fig. 1 and 2).

Blood examination showed a hemoglobin concentration of 9.5 grams per 100 ml, a leucocyte count of 20.000 per mm^3 with a shift to the left. Urinalysis showed no abnormalities.

A bronchopneumonia with atelectasis of the right upper lobe and a right sided interlobar pleural exudate was suspected. But thoracocentesis yielded no fluid. This fact combined with the abscence of the liver on palpation leads us to another differential diagnosis i.e. a bronchopneumonia with right upper lobe atelectasis in a child with a diaphragmatic eventration.

Ampicillin 100 mg with cloxacillin 50 mg per Kg bodyweight per day, divided in 3 doses, was given intramuscularly.

The child's condition improved rapidly i.e. the fever subsided after 3 days of treatment and the white blood count became normal on the 8th day.

On the 6th hospitalization day another rontgenogram of the chest was made which showed a clearing of the right upper lobe opacity and most of the bronchopneumonic spread on the left lung, but persistence of the spindle-shape shadow at the right base (fig. 3). A lateral view showed also this spindle-shape shadow and only one diaphragm, presumably the left one. We failed to see the "normal shadow" of the liver, instead we found a gas filled intestinal loop in this area (fig. 4). These findings made the diagnosis eventratio diaphragmatica more likely.

Antibiotic treatment was discontinued after 10 days. On the 2nd day of admission, after consultation with

Fig. 5 : *X foto (AP), May 27, 1971. artificial pneumoperitoneum*

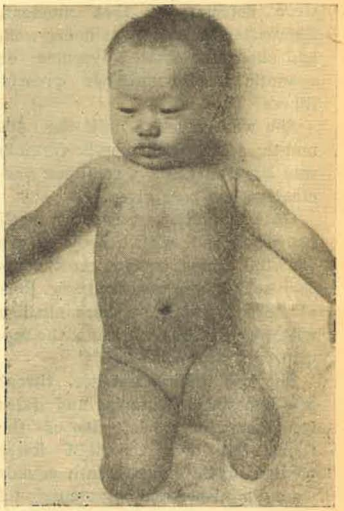

Fig.6 : *Picture of the patient, a day before discharge.*

the radiologist, the baby was given an intraperitoneal inflation of 20 ml of air, by using a 20 gauge needle and a 10 ml syringe e.g. an artificial pneumoperitoneum (Avnet, 1962; Banyai, 1946). But this amount of injected air only resulted in an air sickle below the left diaphragm, seen on the rontgenogram taken with the baby in the upright position.

The following day the same procedure was repeated, but this time 35 ml of air was injected. The X-ray picture taken 30 minutes afterwards showed clearly an air sickle below the left normal diaphragm and below the eventrated right leaf as well.

This confirmed the diagnosis of a right sided diaphragmatic eventration. The spindle-like shadow below the strip of air must be the liver (fig. 5).

Except that the baby was more irritable during the night, she suffered no ill effects from this diagnostic procedure and she was discharged three days later.

One week after discharge she was seen again and she appeared in good health at that time.

Discussion

Diagnosing the eventration in this case met some difficulties because of the accompanying pneumonic process. At first examination it was very logical to think of an inflammatory process in the right lower lobe of the lung as well, i.e. an interlobar pleural effusion. But because no fluid was obtained at thoracocentesis and because no liver was found on palpation or percussion an eventration was considered in the differential diagnosis.

After clearing of the physical, laboratory and rontgenologic symptoms of the bronchopneumonia after one week of treatment, but persistence of the right lower lobe abnormality, eventration of the right diaphragm was the most likely diag-

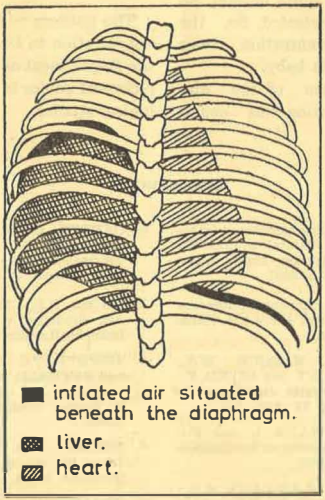

fig. 7. diagramatic figure of fig.6.

nosis, which was confirmed in this baby by giving her an artificial pneumoperitoneum.

A diaphragmatic eventration with compressed or hypoplastic lungs, predisposes to respiratory infections, and bending of a bronchus can easily lead to atelectasis. Both these complications were encountered in this patient.

After treatment of the pulmonary infection and clearing of the atelectatic shadow in the right upper lobe, which was very likely caused by a purulent mucus plug in the bronchus, the baby appeared quite normal, no dyspnea could be detected. So, the diaphragmatic eventration was symptomless in this baby.

Surgical correction of the diaphragmatic eventration was considered, but after consultation with the surgical department it was deemed necessary to wait till the baby became somewhat older.

Summary

A case of a right-sided diaphragmatic eventration complicated by a bronchopneumonia with an upper lobe atelectasis was presented. The diagnosis was confirmed by giving the baby an artificial pneumoperitoneum and by X-ray studies.

Acknowledgement

The authors wish to express their appreciation to Dr. Asmino, Head of the Department of Radiology, for his technical advice in making the radiological studies.

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