CASE REPORT

A Case of Duodenal Atresia

by

PARMA UMI ASNIL, SUMANTO and DARWIN ARSJAD

(Departments of Child Health, Surgery and Radiology, Medical School, University of Andalas/Central General Hospital, Padang, West Sumatra)

Introduction

Congenital atresia of the intestines and colon is an uncommon malformation in which there is complete obstruction of the alimentary tract.

It rapidly produces vomiting, severe dehydration, and possibly rupture of the blind intestine. If no surgical relief is given, death supervenes in most cases in the first week of life, but surgical therapy is followed by high mortality. Prompt recognition of the obstruction and immediate operation give the only hope of survival (Gross, 1953).

Vidal (1915) as cited by Young (1966) is the first who report the successful treatment of neonatal duodenal obstruction.

The reported mortality has remained between 35% — 60% (Young, 1966).

Received 12th August 1971

More or less a quarter of congenital atresia of the intestines and colon is the congenital duodenal atresia, according Gross' cases.

This case is the first case found and operated at the Department of Child Health of the Central General Hospital in Padang, during the last 5 years.

Case Report

At the 5th of April 1971, a 36-hour-old male infant was admitted to the pediatric department of the Central General Hospital in Padang, with the chief complaints of regurgitation and vomiting, beginning at about three hours of age, and increasing after feeding had been started at 24 hours of age. The initially vomited substance looked like amniotic fluid (greenish), but after feeding they

became dark-brown. Only a small amount of meconium stool was passed, of which the colour was lighter than normal meconium.

Birth weight was 2300 grams; hydramnion complicated the pregnancy. Crying and spontaneous breathing occurred instantly. Examination on the day of admission revealed an acutely ill and dehydrated baby. Body weight was only 1800 grams.

X-ray films showed a double-bubble sign, and the diagnosis of "duodenal atresia" was considered. Gastric tube feeding and intravenous fluid drip therapy of glucose-saline solution 4 : 1, 400 ml daily, were administered. On the 2nd day, the general condition improved so that operation could be performed under general anesthesia using opendrop aether.

An upper midline incision was performed. The stomach and the duodenum up to the end of the descending loop were markedly distended. There was no horizontal loop of the duodenum.

The rest of the small intestines and colon were collapsed. A very rapid exploration revealed no other abnormalities in the abdominal cavity. Because of the precarious condition of the baby, a side-to-side gastro-jejunostomy was considered as the least traumatic procedure and was promptly performed.

Post operative gastric tube feeding and fluid drip therapy were continued.

Twenty four hours elapsed uneventfully and large amounts of meconium were passed. The baby started to be able to swallow very small quantities of water given after 30 hours, but then sclerema developed and vomiting occurred. Soon the oral feeding was withheld.

The next day the temperature rose highly and the general condition deteriorated. The baby died at the end of the second day post operation.

X-ray film showed "a double-bubble sign" (see figure).

Discussion

Congenital atresia of the intestines is a malformation which is uncommon, but causes complete obstruction of the alimentary tract and urgently requires surgical treatment (Shackelford, 1961).

The most common location of intestinal atresia is the distal portion of the ileum, the second most common site is the duodenum, usually slightly distal to the ampula of Vater (Singleton, 1959). Gross (1953) found 140 subjects with congenital atresia of the intestines and colon, 72 cases (51,43%) occur in the ileum, 32 cases (22,85%) in the duodenum and 36 cases (25,72%) in the colon and jejunum. Bodian et al. (1952) found a high incidence of mongolism in 32 infants with congenital

atresia or stenosis of the duodenum. The frequency of this association has not been generally appreciated, presumably because most children with duodenal atresia or stenosis die during the neonatal period, when mongolism is apt to be overlooked. However, the incidence of duodenal atresia with mongolism has been estimated to be as great as 1:3 (Singleton, 1959).

Embryology

During the 5th week of fetal life, rapid proliferation of the epithelial lining of the digestive tract occurs, occluding the lumen and converting the hollow structure into a solid cord of the epithelial cells. At about the 10th fetal week, vacuoles form within the cells, enlarge and coalesce until the lumen is reestablished, probably at the 12th week.

If coalescence is incomplete so that the continuity of the reformed lumen is interrupted, atresia will result (Singleton, 1959). Although the above explanation of congenital atresia and stenosis is the one most commonly accepted, Evans (cited by Shackelford, 1961) believes that atresia of the intestines is due to a mechanical trauma, which occurs early in the fetal development with a frequency governed by the law of chance, producing an abnormal bowel wall. He states that the condition is a congenital anomaly only because the accident occurs during intrauterine life.

Clinical picture and diagnosis

The diagnosis of duodenal atresia is not difficult. Vomiting begins within a few hours after birth, before ingestion of any fluid. It consists of gastric and duodenal secretion containing at times mucus. Due to the great majority of atresia involving the second and the third portions of the duodenum, vomitus almost always contains bile (Schaffer, 1960). In rare cases in which the atresia is proximal to the ampula, bile is naturally absent.

After feeding, the amount vomited may be large and moderately forceful, but usually as a continuous regurgitation of small quantities. Gross (1953) points out that in duodenal atresia, distention will be limited to the epigastrium or may be absent if the stomach has been emptied by repeated vomiting.

In the duodenal obstructions, peristaltic waves may be seen crossing the epigastrium from left to right. Examination of the stools may help in establishing the diagnosis of intestinal atresia. The absence of cornified epithelial cells (Farber's test, cited by Shackelford, 1961) in the meconium of a newborn infant is occasionally of value in differentiating atresia from other types of congenital obstruction.

On radiologic examination of duodenal atresia, the stomach and duodenal bulb are markedly distended, and there is no gas in other portions

of the intestinal tract. This has also been referred to as "the double-bubble sign".

Atresia located more distally in the duodenum, naturally has a longer segment of dilatation. It may be impossible to differentiate radiologically between atresia of the proximal portion of the duodenum and complete obstruction produced by such extrinsic factors as volvulus of the mid-gut, annular pancreas and peritoneal band (Singleton, 1959).

Treatment

Experience has proved that for high atresia of the duodenum, it is better not to attempt any direct attack on the atresia itself, but always to leave it undisturbed and to relieve the obstruction by an appropriate anastomosis that will circumvent the atretic area (Shackelford, 1961).

For atresia of the duodenum, an isoperistaltic duodenojejunostomy is the operation of choice (Gross, 1953). 1953).

Gastroenterostomy should be avoided in treating duodenal atresia because experience has proved that often following this procedure, the food would pass the pylorus and turn back and forth in the blind duodenum, producing nausea and other symptoms requiring duodenojejunostomy for their relief (Shackelford, 1961).

There are two types of atresia subjects for which gastroenterostomy is indicated:

1. The atresia is in the first part of the duodenum.
2. Premature infants with intestines so small that the performance of a duodenojejunostomy is technically very difficult.

Prognosis

The mortality rate remains high, varying from 30 — 65% in the most recently published series (Schaffer, 1960). A higher mortality is also associated with prematurity, complication of pregnancy (as hydramnion, toxaemia gravidarum), delayed diagnosis and the presence of other serious abnormalities (Young and Wilkinson, 1966).

Summary

A case of congenital duodenal atresia has been presented, which for the Central General Hospital in Padang is the first case encountered. The literature is briefly reviewed.

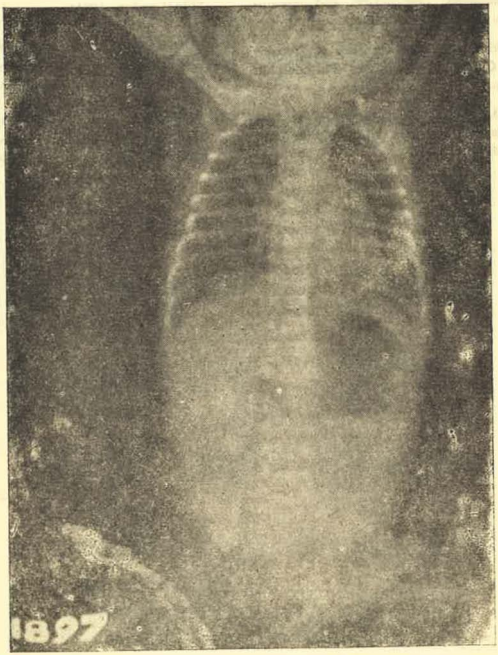

FIGURE : *X-ray film showed "a double-bubble sign".*

REFERENCES

1. BODIAN, M.; WHITE, L.L.R.; CARTER, C.O. and LOUW, J.H. : Congenital duodenal obstruction and mongolism. Lancet i : 12 (1952).

2. GROSS, R.E.: The Surgery of Infancy and Childhood (Saunders, Philadelphia 1953).

3. SCHAFFER, A.J. : Diseases of The Newborn (Saunders, Philadelphia/London 1960).

4. SHACKELFORD, R.T.: Surgery of The Alimentary Tract (Saunders, Philadelphia/London 1961).

5. SINGLETON, E.B.: X-ray Diagnosis of The Alimentary Tract in Infants and Children (Yb.

6. YOUNG, D.G. and WILKINSON, A.W.: Mortality in Neonatal duodenal obstruction. Lancet. ii : 2 (1966).