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THREE TYPES OF OCCLUSION OF THE ESOPHAGUS IN EARLY LIFE *

THOMAS MORGAN ROTCH, M.D.
BOSTON

The following cases of occlusion of the esophagus of non-traumatic origin have been under my care in the wards of the Children's Hospital. The rather unusual occurrence of the condition in my experience and the importance of recognizing which type we are dealing with, on account of prognosis and treatment, are my reasons for reporting them. Considering the rarity of the condition it is to be noted as a coincidence that during Dr. Morse's service, preceding mine, three cases of esophageal narrowing entered the same wards and have been reported by him.

CASE 1.—The first case is that of a boy 25 months old. The labor was normal and the infant was normally developed. He was fed on breast milk for the first seventeen months. From birth he had always vomited, from four to six times daily. The vomiting had always occurred during the feedings and was never forcible. The child gagged or coughed a little and a considerable amount of the feeding would come out of his mouth. Sometimes he vomited just as he began his feeding and the amount then was a great deal more than he had just swallowed. The vomitus consisted of unchanged milk, not curdled or sour, and had no regular relation to the feedings. Sometimes he would retain several feedings and then vomit during the next two or three. He not only vomited breast milk but modifications of cow's milk. He seemed to be always hungry and had to be fed at least twelve times a day. It was found that he vomited less if he had only three ounces given at a feeding. He had always been constipated and he soon became a pale, thin baby.

Physical examination, beginning with the mouth and throat, was negative except for the heart, which was found to be decidedly dislocated to the right, and there was a blowing, systolic murmur, loudest at the base and transmitted to the left axilla. There was no systolic retraction. The urine was normal. Listening with a stethoscope over the epigastrium, when the child was swallowing, a slight splashing sound was heard fifteen to twenty seconds after the mouthful of milk had been swallowed. The sound was like that of a metallic trickling as though the milk came into the stomach by drops. The usual time for liquid to pass into the stomach at this age is five seconds.

A bismuth meal was given and a Roentgen examination immediately made. This showed a narrowing of the lower third of the esophagus extending not quite to the cardia. The esophagus was shown to be a little to the right of the median line and there appeared to be pericardial and mediastinal adhesions. The esophagoscope showed a stricture of the esophagus about 17 cm. from the incisor

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teeth, approached by a funnel-shaped narrowing while the upper part of the esophagus was found to be slightly dilated. The narrowing appeared very great and a sound, $\frac{1}{4}$ cm. in diameter, could not be introduced. It may be said here that the distance from the gums to the cardia in the newborn is about 17 cm. and at three years from 23 to 24 cm. Figures 1, 2 and 3 show the stricture and 2 and 3 show that a certain amount of the bismuth meal had trickled through into the stomach. The child lost rapidly in weight and strength and the stricture was so small that it was deemed dangerous and therefore inadvisable by Dr. D. Crosby Greene to attempt to dilate it through the esophagoscope by the usual means. I might say in passing that in congenital cases, of which type this seemed to be, there is apt to be increased connective tissue around the esophagus which may extend down and form adhesions and thus displace the heart. It was these adhesions which were supposed to have caused the dislocation of the heart to the right. The only means of saving the child's life appeared to be a gastrectomy which would permit of the child's being fed directly into the stomach, and it was thought that when the general condition improved he might be able to stand the manipulation necessary to dilate the esophagus. The operation was performed but the child died. No autopsy was permitted.

This case represents an extreme congenital organic condition of a type which as a rule is inoperable and is almost universally fatal.

CASE 2.—The second case is a more favorable type for treatment and for life. This case represents a type of probable congenital narrowing not necessarily, however, of organic lesion in the esophagus but caused by congenital central spasm, resulting in dilatation of the esophagus above the point of narrowing. A girl of 10 years old, normal at birth, was fed on breast milk for eleven months and during this time was well and strong. She was then given cow's milk and cereals and at once began to vomit regularly during her meals. She would vomit several times while taking her food. The amount vomited was small, never more than a few mouthfuls. The vomiting caused her a good deal of effort and distress until she learned to aid its occurrence by putting her fingers down her throat. This continued until she was 4 years old and she had become a thin, pale, constipated child. At this time she swallowed a piece of meat in her soup and for four days following she vomited everything, even water. The vomiting then gradually lessened and she was kept on a diet of milk and cereals for two years. Since that time she had developed well and had become a strong, well girl. There was no history of her having swallowed anything corrosive. Four days before she was seen at the hospital she ate an orange and an hour later she was unable to eat her dinner because of discomfort which was only relieved by inducing vomiting with her fingers. She was unable to swallow anything, even water, without having to vomit it directly. She was in a very weak condition.

Nothing abnormal was found on physical examination. A bismuth meal was given and a Roentgen picture showed that the bismuth had passed only a little way beyond the middle of the esophagus, as shown in Fig. 4, and that there was none in the stomach. The part of the esophagus containing the bismuth was shown to be greatly dilated and at the bottom of this dilatation a circular object was made out the size of a small coin. An oval esophagoscope $1\frac{1}{2}$ by 1 inch in diameter was passed into the esophagus by Dr. Greene and encountered a mass of orange pulp mixed with the bismuth. This was withdrawn and was found to be practically the whole of an orange pulp. Entangled in it was a penny. After removal of the obstruction the esophagus was examined. Marked dilatation of the lower third was observed, and a constriction $\frac{1}{2}$ cm. in diameter at a distance of 25 cm. from the incisor teeth. The distance for a child of this age should be about 27 to 30 cm. The stricture was dilated and it was then found that a sound, 1.6 cm. in diameter could be passed. The child could then take soft solids without discomfort. Figure 5 shows the stricture after the obstacles had been

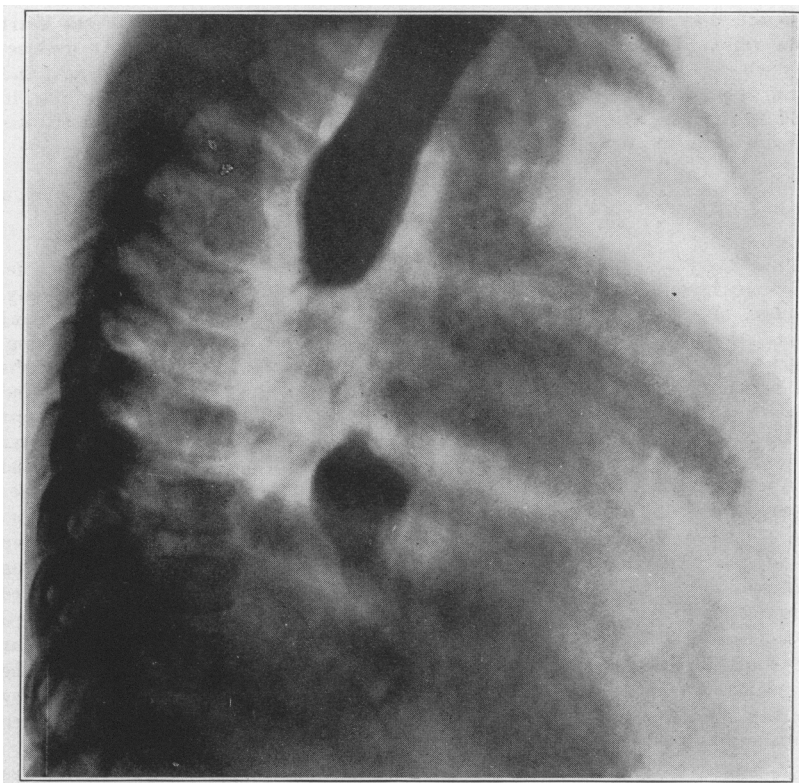


Fig. 1.—Stricture of the esophagus.

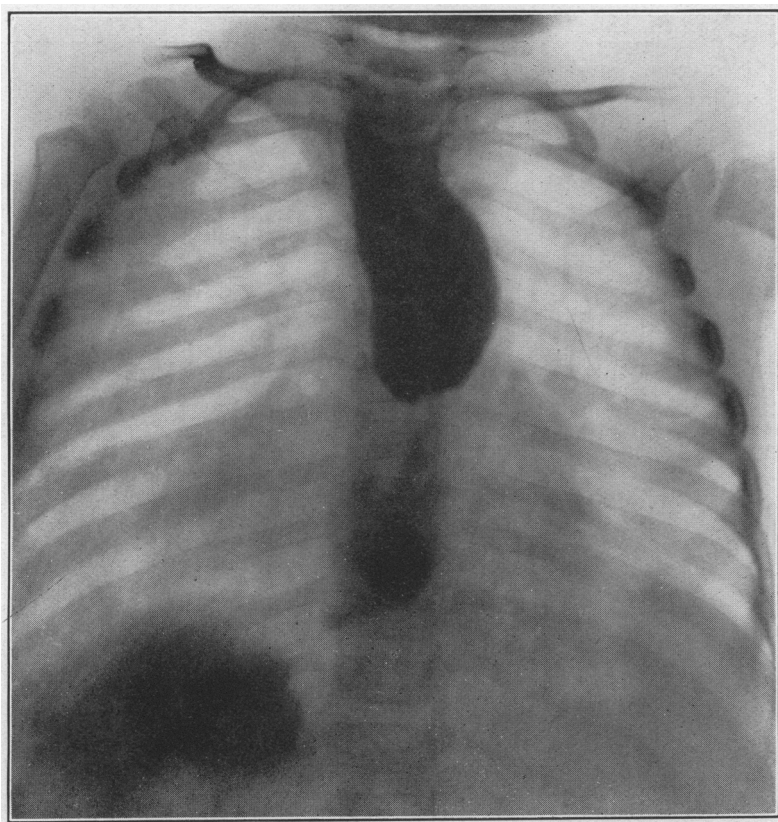


Fig. 2.—Stricture of the esophagus showing that a portion of the bismuth meal had trickled through the stricture into the stomach.

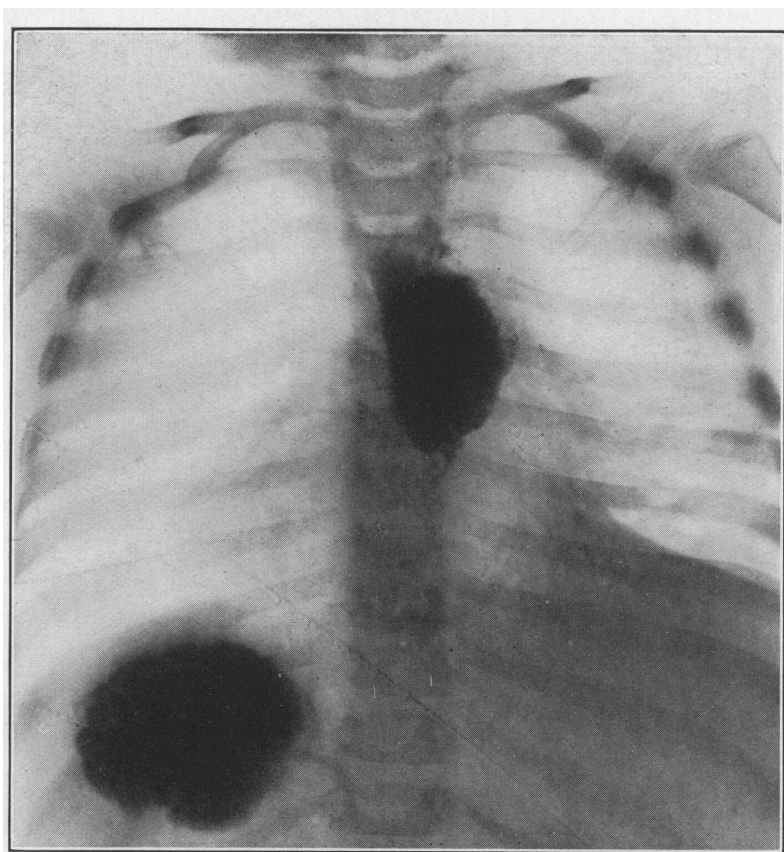


Fig. 3.—Stricture of the esophagus. A portion of the bismuth meal has trickled through into the stomach.

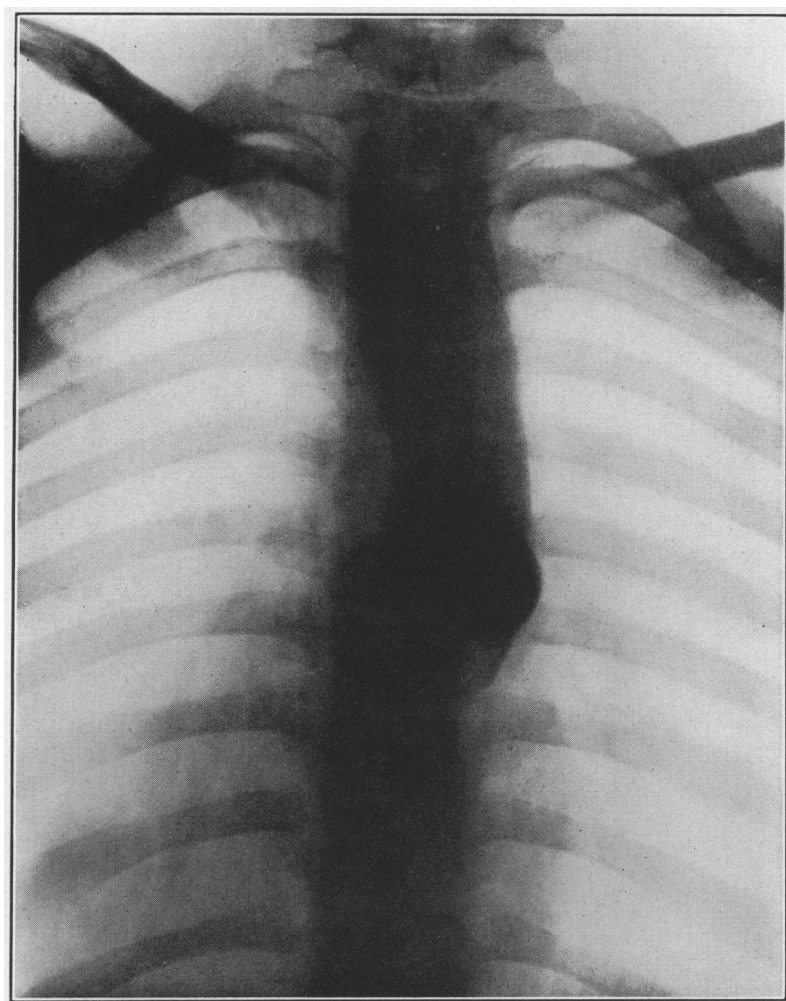


Fig. 4.—Stricture of the esophagus in a girl 10 years old, showing that the bismuth has passed only a little way beyond the middle of the esophagus.

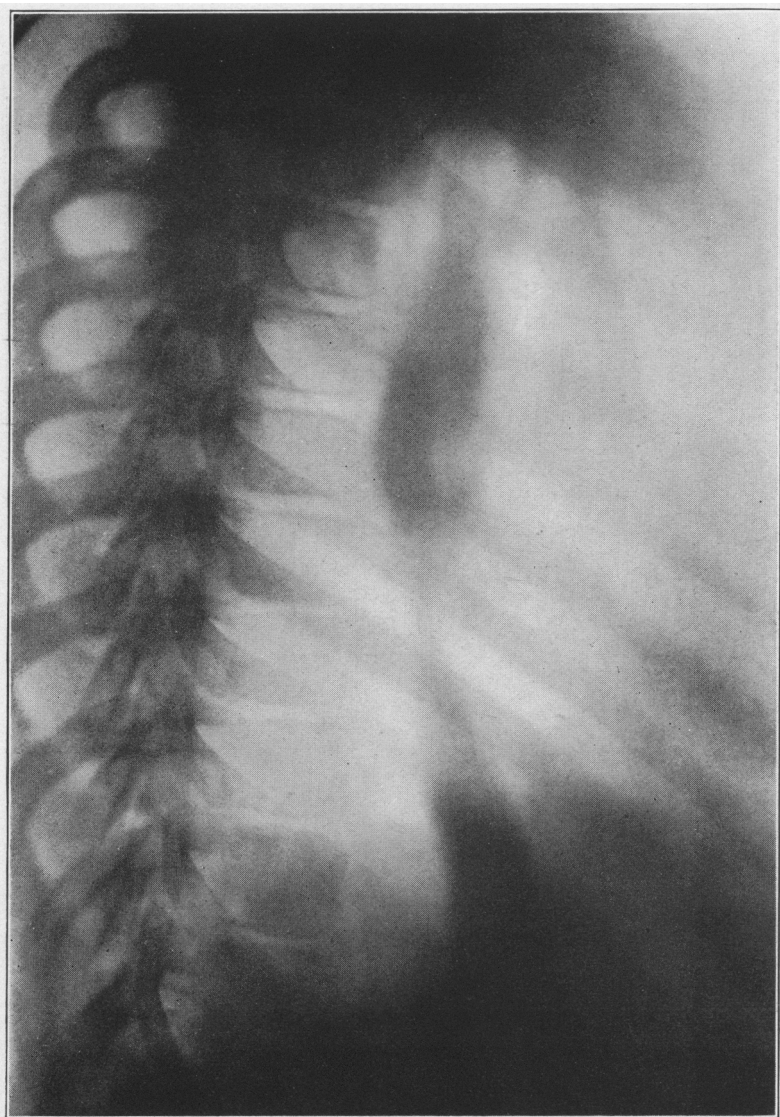


Fig. 5.—Stricture in same case as Figure 4 after obstruction in the form of orange pulp and a penny had been removed and dilatation performed.

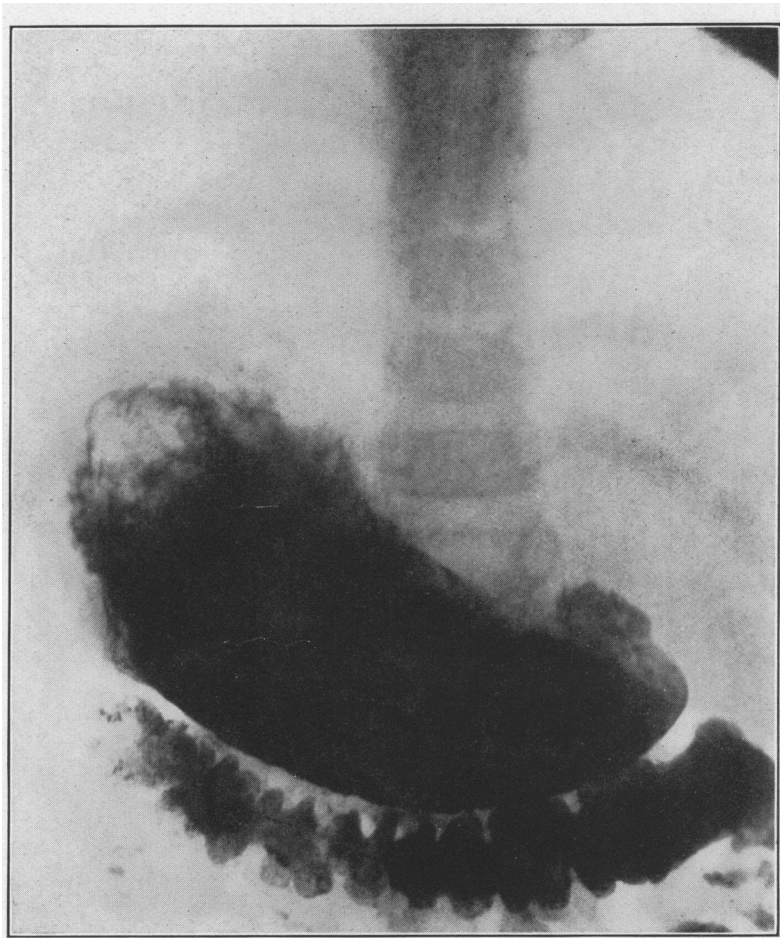


Fig. 6.—Stricture of the esophagus of the spastic variety in a boy $5\frac{3}{4}$ years old. The bismuth is shown as having passed into the stomach. There was no pyloric stenosis.

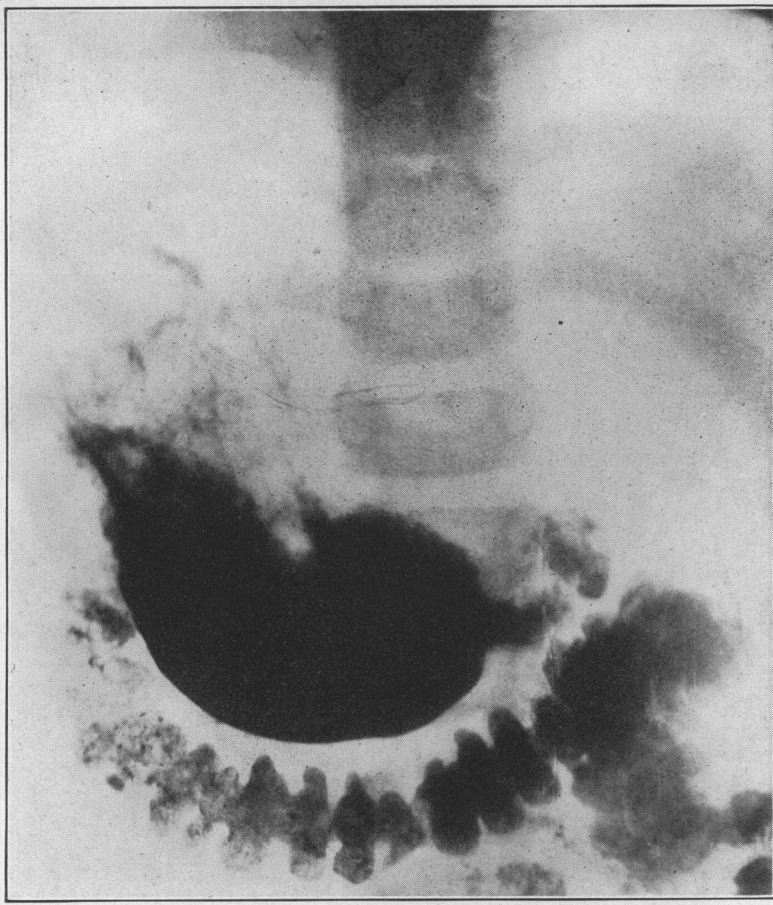


Fig. 7.—See Fig. 6 for description.

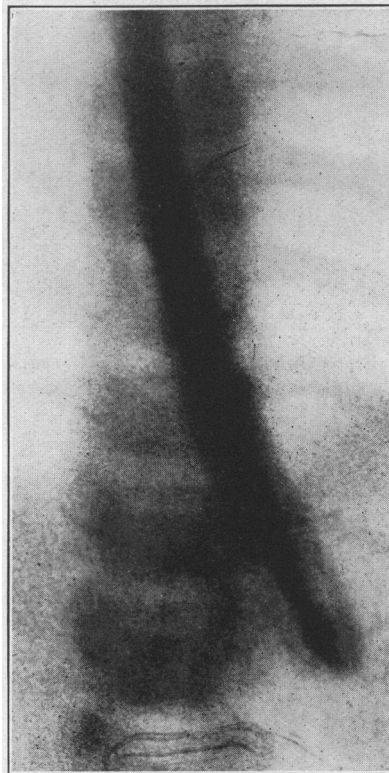


Fig. 8.—Showing the stomach tube in the stomach after brief resistance at the cardia. Same case as Figures 6 and 7.

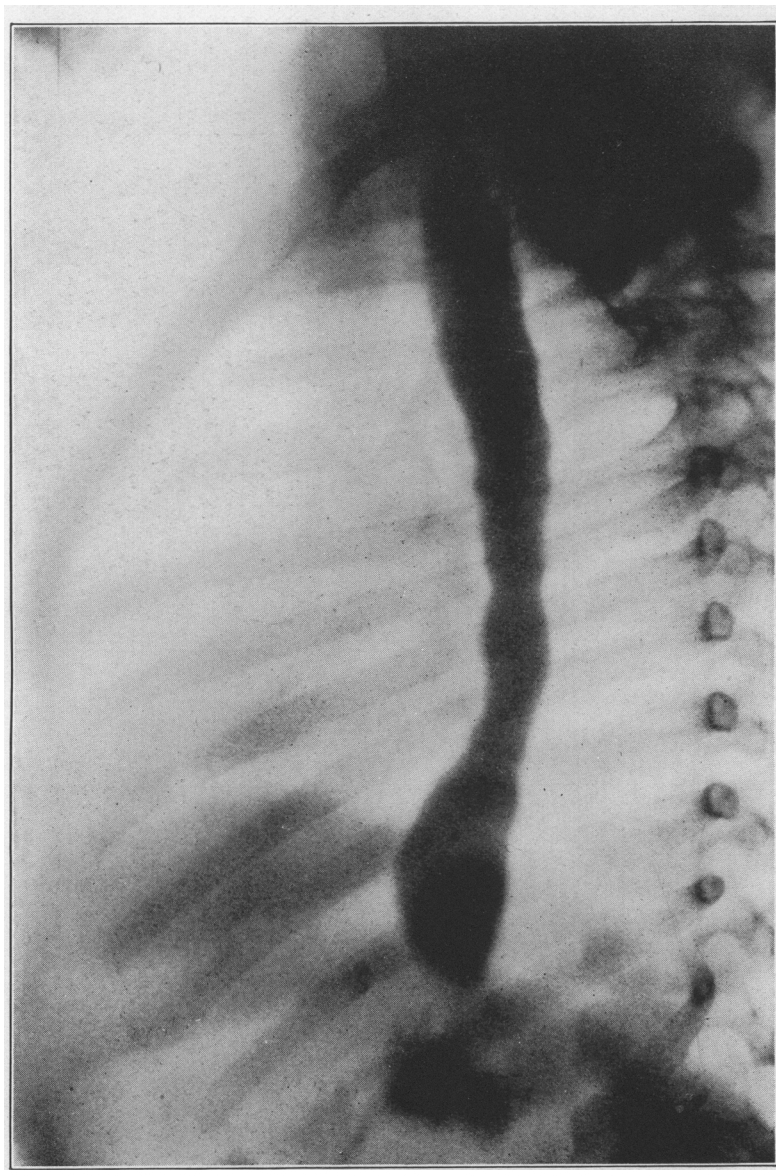


Fig. 9.—Same case as Figures 6, 7 and 8, the child lying on his face, the esophagus full of bismuth and the presence of a stricture in the cardiac end of the stomach.

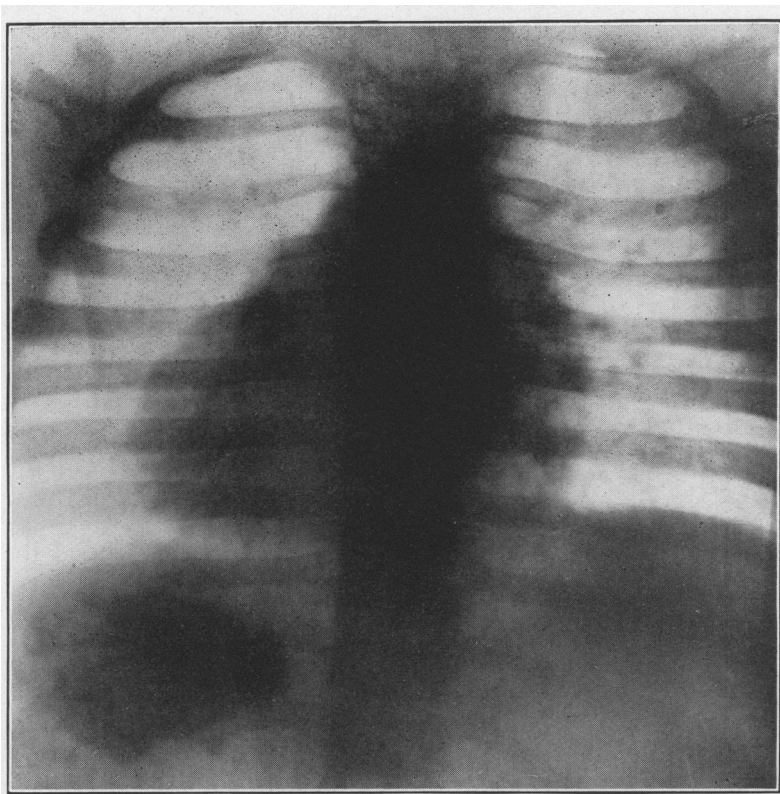


Fig. 10.—Same case. Roentgen picture taken after bismuth meal, following treatment by dilatation, showing that the bismuth has passed freely into the stomach.

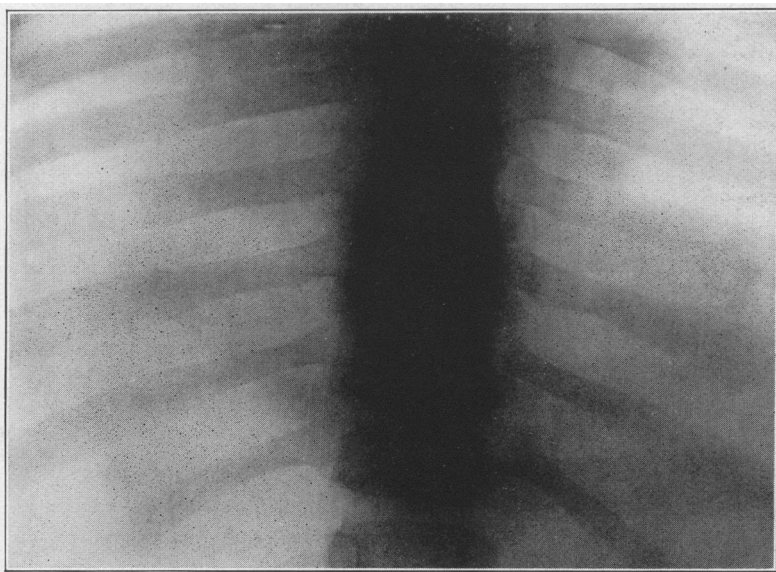


Fig. 11.—Same case. On a recurrence of the symptoms, this radiograph was taken, showing the presence of a coin which was prevented by spasm from entering the stomach. It was removed with the aid of the esophagoscope.

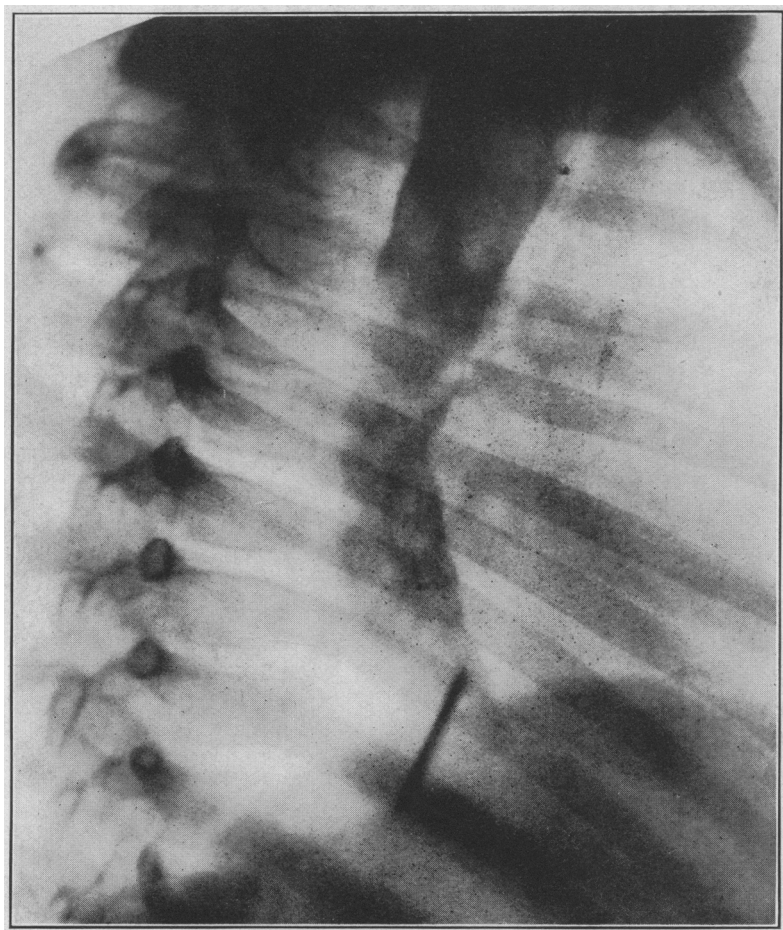


Fig. 12.—Same case. A week later, vomiting having recurred, the esophago-
scope was passed and a piece of bristle discovered, which was removed. It had
caused spasm.

removed. The child gained in weight and strength and after having the esophagus dilated at intervals, got entirely well, and on leaving the hospital was eating the regular house diet.

This patient is one who, from time to time, should be treated by dilatation through the esophagoscope, and will, under these conditions, probably continue to do well. The intervals for necessary dilatation will grow longer, and eventually dilatation will, in all probability, be unnecessary.

The history and appearance at the first examination inclined Dr. Greene to the belief that the case was one of organic congenital stricture of the esophagus at the cardia, but the subsequent ease with which the resistance gave way led him to believe that it was probably merely a case of cardiospasm. In the etiology of these cases of spasm of the cardia the congenital element is a likely factor. The spasm occurs at the point of normal constriction and is simply an exaggeration of normal spasm. This case, which represents a narrowing of the esophagus on the border line between a local organic condition and one of central spasmodic origin, is of a type exceedingly favorable for treatment.

CASE 3.—The third case is that of a boy $5\frac{3}{4}$ years old. He was normally developed at birth. So long as he was fed on liquids and soft solids he did not vomit. There was no history of anything corrosive having been swallowed. When he was $5\frac{1}{2}$ years old he began to vomit everything that he ate.

Physical examination revealed nothing abnormal. The bowels had been constipated but he had complained of no pain and there were no other symptoms excepting the loss of weight. The urine was normal.

Bismuth meals were given and Roentgen pictures taken at intervals. These revealed nothing abnormal in the chest, and the bismuth had passed into the stomach and intestines, showing that there was no pyloric stenosis. Figures 6 and 7 show this. He was then given bread and milk and again vomited after taking a few mouthfuls. A stomach tube No. 34 French, was passed and met with a resistance at a distance of 24 cm. from the incisor teeth. The normal distance from the incisor teeth to the cardia at this age, according to Morse, is about 27 cm. After a short time the resistance gave way and the tube was passed into the stomach as shown in Figure 8. The tube was then removed, a bismuth meal given, and a Roentgen picture again taken. Figure 9, the child lying on his face, shows the esophagus entirely full of bismuth and the presence of a stricture near the cardiac end of the stomach. He was then treated by having the stricture dilated every four hours. Later a bismuth meal was given without the tube and a Roentgen again taken. This (Fig. 10) shows that the bismuth has passed freely through into the stomach. Some days later he began to take liquids, having the tube passed only once a day for two weeks. After this he was able to take house diet without vomiting.

Dr. Greene at this time passed the esophagoscope and found that the esophagus was unusually roomy above the cardia, especially at its lower third. Spastic closure of the cardia was noted but this was relieved by slight pressure and the esophagoscope was passed through it. There were no signs of bagging of the esophagus nor any pouch, and the spastic closure of the cardia was always easily obliterated by slight pressure.

The child remained perfectly well for two weeks and then began to vomit everything, even water. A Roentgen picture then showed the presence of a foreign body in the esophagus, and Dr. Greene, by means of the esophagoscope, removed

a quarter dollar. Figure 11 shows the quarter prevented by the spasm from entering the stomach. The child then seemed perfectly well and there was no vomiting for a week. He then began to vomit again and when the esophagoscope was passed it revealed a piece of bristle just above the cardia. This was easily removed by forceps. Figure 12 shows the bristle. Since this time the child has occasionally had a slight spasm of the esophagus and dilatation has been done once or twice. The spasm, however, is growing less and probably will soon cease to appear. The child did not seem to be of a nervous temperament and his parents were not neurotic.

There seem to be two classes of esophageal narrowing irrespective of those of traumatic origin. Both classes will probably be found to be of congenital origin. One of them, however, is a localized organic condition in the walls of the esophagus, while the other is a functional, with possibly an additional organic, congenital condition of a brain center, which is represented by a lack of inhibition.

It is possible that pure spasms of the esophagus are mostly congenital and are located in the brain.

197 Commonwealth Avenue.