INTESTINAL INTUBATION FOR BARIUM PRODUCED BOWEL OBSTRUCTION

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BARIUM SULPHATE suspension used as a contrast medium to diagnose lesions of the gastrointestinal tract has been developed to the point at which radiologists are able to diagnose even very small lesions. Its use in the diagnosis of bowel obstruction is generally limited to barium enema studies to delineate the bowel distal to an obstructing lesion. It was realized very early that to use barium sulphate for visualization of the upper gastrointestinal tract in the presence of partial or complete bowel obstruction would be extremely dangerous for the patient. The putty-like barium resulting after absorption of the water from the barium sulphate suspensions could effectively plug-up an obstructed bowel as well as causing a partial obstruction to become complete. No radiologist would knowingly use barium sulphate suspension in the routine upper gastrointestinal series if a partial or complete obstruction of the bowel were suspected. Such upper gastrointestinal studies can be carried out even in the presence of partial or complete bowel obstruction if a long intestinal decompression tube is first passed far down into the small bowel (1, 2). The injection of a dilute suspension of barium sulphate through the long intestinal tube safely permits gastrointestinal study. A puddling of the barium will invariably occur at the site of a partial obstruction. A complete blockage of the barium occurs at the site of complete obstruction. After radiological as well as fluoroscopic study of the progress of this barium suspension has been made, and a diagnosis of an obstructing lesion verified, the excess barium sulphate suspension may safely be aspirated by the long intestinal decompression tube.

Despite the universal acceptance of the dictum that barium sulphate suspension must not be given for an upper gastrointestinal series if obstruction of the bowel is suspected, such barium suspensions may be administered because of a failure to diagnose or even suspect the presence of a partial bowel obstruction. The complete obstruction which invariably resulted would then be extremely difficult to correct. Not infrequently the barium remaining after routine upper gastrointestinal series might produce bowel obstruction some days after the radiological study (3, 4, 5, 6).

The use of a long intestinal decompression tube with an 18 fr. lumen (Cantor tube) provides an ideal instrument to remove barium sulphate suspensions given by error in the type of case mentioned. In the case report to be presented, an upper gastrointestinal series was ordered because of a failure to recognize the presence of a partial bowel obstruction. The radiologist noted a greatly distended barium visualized small bowel due to a complete bowel obstruction (see figure 1). This was the result of the barium sulphate suspension converting an incomplete obstruction into a complete one.

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The same effect has been reported by the too forcible injection of barium sulphate as an enema in the diagnosis of obstructing lesions of the rectosigmoid (7). In cases of this type, the barium sulphate may be forced through incomplete obstructions of the rectosigmoid or sigmoid only to form putty-like masses proximal to the stenosing lesions. A complete obstruction would then result.

Figure 1: X-ray taken 1-11-49. Note the distension of the small bowel as brought out by the contrast medium.

The treatment of such barium induced bowel obstructions generally consisted in giving large amounts of mineral oil by mouth in an effort to soften the barium mass, kneading of the mass of barium through the intact abdominal wall, high colonic irrigations, and proctoscopic dislodgement with removal of such masses in the pelvic colon. Fatal cases of ileus as a result of barium impaction have been reported (3). Baronofsky found it necessary to do a one stage total colectomy with ileosigmoidostomy to remove a carcinoma of the rectosigmoid and correct a barium induced obstruction of the colon. In this case, an incompletely obstructing carcinoma of the rectosigmoid was converted into a complete obstruction of the colon by the forcible in-

jection of barium sulphate proximal to the stenosing lesion.

Using a single lumen simplified intestinal decompression tube to remove barium sulphate suspensions from the small bowel was found to be a simple, safe, and effective procedure. In forty-eight hours, the barium suspension producing small bowel obstruction may be easily diluted and evacuated through the long intestinal decompression tube. The case being reported is an excellent example of the efficiency of this method of treatment.

CASE REPORT

K. H., a sixty-four year old woman was admitted to the Grace Hospital January 9, 1949 with a diagnosis of gallbladder disease. Her chief complaint was upper right quadrant and epigastric pain. She had been comparatively well until September 1948 at which time she had an attack of epigastric pain which was knife-like in character and was more severe in the right upper quadrant. About two weeks before that Christmas, she began to vomit periodically. This was often associated with diarrhea. This latter would invariably relieve her right upper quadrant pain. Olive oil and orange juice relieved her pain somewhat. At times the pain was generalized over the entire abdomen. The vomiting and diarrhea subsided shortly after Christmas of 1948, but the epigastric pain continued. She now noted difficulty in keeping solid food down. The pain increased in severity. For this reason hospitalization was advised.

Past history: Usual childhood diseases. No previous surgery. Marital: para 11. gravida 11. Family history: mother died of biliary disease. Father died of hypertension. Sister died of kidney disease. No history of tuberculosis, carcinoma, diabetes, or epilepsy in family.

On examination the patient was found to be an elderly white woman of about the stated age. Temperature 99, pulse 100, respiration 24. Head, Eyes, Ears, Nose, Throat, Neck, and Chest: no pathology noted. Abdomen: Soft and not distended. No masses. Tenderness and rigidity with spasticity upon palpation noted in the right upper quadrant, and in the epigastric region. Metallic bowel sounds audible in the upper abdomen. Liver, spleen, and kidneys not palpable. No lymphadenopathy. Reflexes normal.

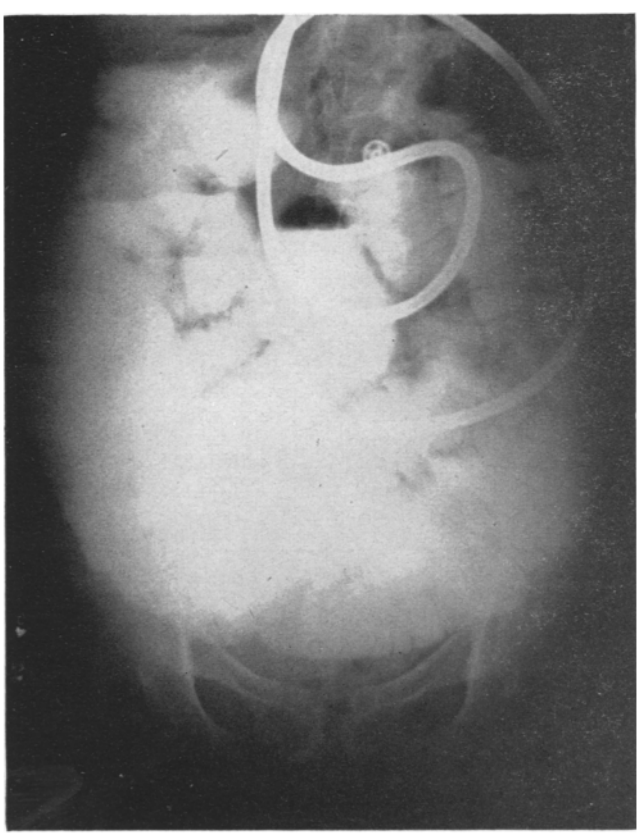

Figure 2: X-ray taken 1-12-49. Note the Cantor tube well down the small bowel in 24 hours.

Laboratory: urine: sp. gr. 1,025, albumin; trace sugar: neg. sediment: negative.

R.B.C. 4,450,000
HHb. 84% 14 grams
W.B.C. 5,400
Polys. 71%
Filaments 65%
Non filaments 6%
Lymphocytes 29%
Kahn: negative

An admission diagnosis of chronic cholecystitis was made.

On January 11, 1949, the patient was given barium sulphate suspension for an upper gastrointestinal series. The following observations were then made:

"No evidence of grossly pathologic conditions could be distinguished on initial fluoroscopic review of the chest and abdomen. On administration of a contrast meal, pronounced so-called curling of the esophagus was observed with retarded passage of contrast fluid through the lumen. The stomach was seen at an unusually high and transverse position. The second duodenal segment descended to a rather low level on the right side so that the duodenal circle appeared somewhat expanded and there also seemed to be some persistent pressure effect on the greater curvature of the gastric antrum from below. Most of the loops of the jejunum filling gradually at this time were seen to the right of the mid-line and ultimately considerable pooling in these loops took place. At the same time, we observed a number of fluid levels in the upper abdomen predominantly to the left of the midline. Suitable roentgenograms were taken of the stomach, duodenum and jejunum. These confirmed our fluoroscopic impressions. The gastroduodenal survey films secured show some intermittent protrusion of prepyloric mucosa into the basal portion of the duodenal bulb. There was some festoon-like looping of the proximal duodenal bend, at times simulating formation of a diverticulum at this level. Subsequent observations covering two hours showed the contrast fluid gradually progressing in the small intestine and diluting markedly with large quantities of retained fluid material in the jejunum and ileum so that ultimately the dilution became so great in the pelvic area and right iliac fossa that it was impossible to distinguish individual loops and the mucosal structure of these intestinal segments. Obviously this patient carries a low obstruction of the small intestine responsible for the observations just recorded.

Diagnosis: Obstruction of the small intestine, in all probability involving a low ileal segment in the right lower abdominal quadrant. Intestinal decompression appears indicated immediately.

Progress. 1-14-49—During the days from 1-11-49 to 1-14-49, an intestinal decompression tube (Cantor) was passed successfully and the bulk of the contrast material removed from the small intestine with a considerable amount of liquid and particulate matter. On these days, 3000 c.c. of liquid was removed from the intestinal tract by the Cantor tube. To remove the barium, it was necessary to irrigate the bowel with 3000 c.c. of water daily in order to keep the barium suspension sufficiently dilute so that it could be aspirated by the Cantor tube. On the days in which this diluting-irrigating process was going on (1-11-49, 1-12-49, and 1-13-49) 6000 c.c. of fluid containing diluted barium, water, and intestinal contents was aspirated daily from the small bowel.

On 1-14-49 radiographic study revealed: "Only minimal amounts of contrast medium seemed to enter the most proximal colonic segments during this period of time. The tip of the Cantor tube was found to be lodged in an unusually low position within the pelvis; that is even caudal to the lower margin of the pubic symphysis so that one might

suspect the obstruction of the small intestine to be located in this area."

On 1-15-49: Under spinal anaesthesia, a right rectus incision was made. Upon opening the abdomen, the terminal ileum and about 4" of the cecum and ascending colon showed evidences of acute inflammation. On careful examination a congenital adhesion 4" from the ileocaecal valve was found to bind the terminal ileum to the posterior peritoneum. This band was cut. It was then noted that the lumen of the bowel was constricted by adhesions reaching from the mesenteric border 2/3 the circumference of the bowel at this point. When these adhesions were all freed, the bowel resumed its normal size. The Cantor tube was left in the bowel just above the point of obstruction and the abdomen closed in layers.

Course: Uneventful recovery. Discharged 1-25-49.

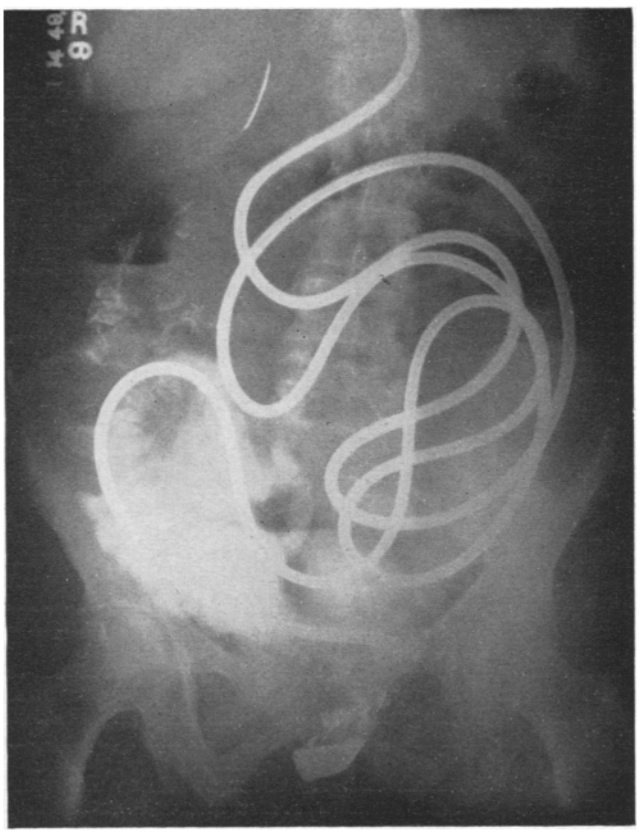

Figure 3: X-ray taken 1-14-49. Note that the barium sulphate as well as the intestinal distension has almost entirely disappeared. 3000 c.c. of intestinal contents were aspirated by means of this tube each day.

SUMMARY

Despite the universal acceptance of the dictum that barium suspension should not be given by mouth to any patient suspected of having intestinal obstruction, an occasional error of this type will occur. This is generally the result of a failure to recognize the presence of a partial obstruction of high degree. In this event, the partial obstruction may be converted into a complete obstruction by the barium contrast medium.

The management of this type of accident is quite simple and effective. A long intestinal decompression tube of adequate caliber should be passed down the gastrointestinal tract. In this type of case because peristaltic activity is generally vigorous in an effort to by-pass the obstructing process, this can usually be rapidly done. The luminal caliber of the long intestinal decompression tube should be as large as possible, preferably 18 fr. With this type of tube well down the bowel, irrigating the bowel through the tube with warm water will effectively dilute the barium suspension permitting its rapid aspiration through the long tube. By this simple method, a serious situation can readily be converted into a relatively simple one. After all the barium has been removed from the bowel and decompression obtained, surgical intervention is indicated to correct the cause of the partial bowel obstruction. In this case reported, a congenital adhesive band was found to be the causative element.

CONCLUSION

1. Intestinal obstruction produced by the unintentional use of barium suspension in a case of partial bowel obstruction, was simply and effectively treated by intubation with a single lumen tube of adequate caliber and holes of sufficiently large size.

2. Surgical intervention is not indicated to remove the barium.

3. Surgical intervention is definitely indicated after proper intestinal decompression in order to correct the obstructing process.

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