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Case Report

A Case of Intestinal Obstruction Caused by Barium Retention after Small Bowel Radiography with Barium Meal

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Abstract

Introduction: It's a rare report about intestinal obstruction caused by barium retention after small bowel radiography of oral barium. An 83-year-old woman was admitted for bile duct cancer with metal stent and incomplete intestinal obstruction .The patient ever did upper gastrointestinal barium meal examination which showed the mucosa of descending part of duodenum was unclear and contrast medium had slow excretion before this hospitalization. There's no obvious abnormalities by small bowel enterography.

Results: After one month, abdominal stand X-ray showed intestinal cavity of left upper abdomen was full of pneumatosis and bowel dilatation, much high density shadow considered residual barium in the middle and lower abdomen.

Discussion: It's a rare report about intestinal obstruction caused by barium retention after small bowel radiography of oral barium. This case present a patient with bile duct cancer and metal bracket. The risk factors include advanced age, advanced bile duct cancer, bowel dysfunction, long term in bed, electrolyte disorder and octreotide reduce digestive fluid for intestinal obstruction need to be considered.

Conclusion: It's the rare and first report. Considering the high morbidity of barium retention to intestinal obstruction, efforts should be made to reduce this complication.

Keywords: *Advanced Bile Duct Cancer; Intestinal Obstruction; Small Bowel Enterography; Residual Bariumin the Bowel*

The reports about intestinal obstruction caused by barium retention after small bowel radiography with barium meal are rare. This case presents a patient with bile duct cancer and metal stent placement who was suffered from intestinal obstruction after barium meal.

The 83-year-old female patient was admitted for recurrent abdominal distension, pain and poor appetite. Her past medical history included hypertension and bile duct cancer with metal stent placement. Physical examination was notable for blood pressure of 156/68mmHg, slight tenderness in the middle upper abdomen and bowel sounds 6-8 times per minute. Laboratory findings showed a hemoglobin of 9.2 g/dl, a white blood cell count of $13.19X10^9$ /L,a CRP level of 70.36 mg/L,a PCT level of less than 0.50 ng/ml,a creatinine level of 25.40 umol/L, and a CA-199level of 38U/ml. Biochemical test showed ALT and AST increased slightly. An abdominal radiograph showed diffused Intestinal gas accumulation with suspicious liquid-vapor surface and partial intestinal dilatation (Figure 1). Enhanced CT scan of the abdomen showed ambiguous gallbladder with low-density shadow, unclear head of pancreas and metal stent in the common bile duct (Figure 2).

Figure 1: *Liquid-vapor surface and partial bowel dilatation.*

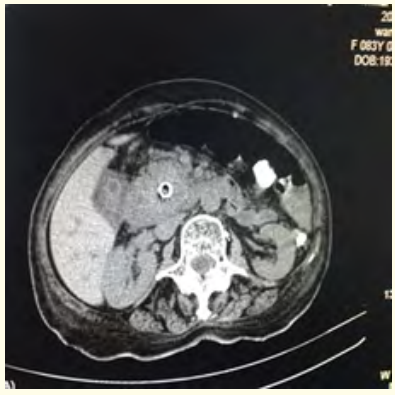

Figure 2: *Ambiguous gallbladder with low-density shadow, unclear head of pancreas and metal stent in the common bile duct.*

Diagnosis: Incomplete intestinal obstruction, bile duct cancer with metal stent placement,2 levels of hypertension, hypoproteinemia.

The course of treatment: She was treated with fat emulsion and amino acid for nutritional deficiency, levofloxacin and piperacillin tazobactam for localized peritonitis, octreotide for intestinal fluid secretion, pantoprazole and mosapride for abdominal distention. The symptom was not relieved after using polyethylene glycol and soap water enemas and the patient still felt abdominal distension, nausea and vomiting. So the upper gastrointestinal barium meal was examined which showed the mucosa of descending part of duodenum was unclear and the contrast agent had slow excretion (Figure 3). One week later, the X-ray showed no barium retention, so the small bowel radiography with barium meal was performed with the result no obvious abnormalities. After one month, abdominal stand X-ray (Figure 4) showed intestinal dilatation and gas accumulation in the left upper abdomen, and a large amount of high density shadow considered as residual barium in the middle and lower abdomen. Therefore, we suggested the patient to eliminate the remaining barium under colonoscopy. It's a pity that the patient turned down our proposal and her condition gradually deteriorated. The result of arterial blood gas analysis as follows"PH7.279$PaCO_2$ 30.10 mmHg, PaO_2 163.00 mmHg, Oxygen saturation 99.30 %, ABE -11.7 mmol/L, SBE -11.8 mmol/L, HCO_3 - 13.6 mmol/L, K+3.15 mmol/L, Na+131.90 mmol/L, Cl-101.30 mmol/L, TropI 0.016 ng/ml". Conservative managements including fasting, potassium supplement and anti-infection and so on were given to relieve the painful symptoms and maintain vital signs. But in final, the patient was died with multiple organ failure.

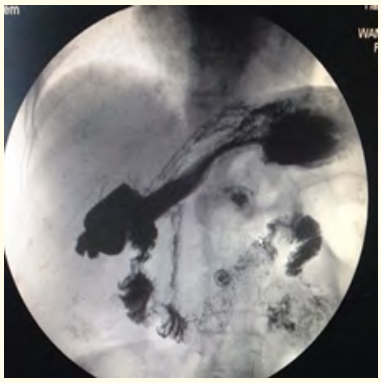

Figure 3: *The mucosa of descending part of duodenum was unclear and contrast medium had slow excretion.*

Figure 4: *Intestinal cavity of left upper abdomen was full of pneumatosis and bowel dilatation, much high density shadow considered residual barium in the middle and lower abdomen.*

Discussion

Mechanical intestinal obstruction is the main cause of intestinal obstruction in the elderly which pathogenesis is complex. Colorectal cancer, persimmon stone and fecal missal ways lead to the elderly intestinal obstruction. Iñíguez A., *et al*. [1] reported a rare case of duodenal obstruction because of Bouveret syndrome. It's difficult to diagnose and treat the elderly with intestinal obstruction due to the insufficient organs and tiring complications. Abdominal X-ray examination is widely used as one of imaging tests, which not only can find liquid-vapor surface but also show volvulus and intussusception clearly. Ultrasound examination in the diagnosis of intestinal obstruction is more common in some countries. With the development and popularization of MRI technology, MRI has been widely applied in the field of intestinal obstruction [2]. Multi row CT scan has the advantages of fast speed, large coverage, and strong post-processing functions and so on. Compared with the traditional surgery, Laparoscopic surgery is a method that can identify the cause of obstruction and is an effective treatment, with shorter operative time, less bleeding, shorter postoperative hospitalization, faster recovery of undergoing barium meal examination [3].

Retrospective analysis was carried out by Guoqiang Chen., *et al*. in 23 patients who received barium meal or small intestinal intubation barium exams because of incomplete intestinal obstruction due to small bowel disease which was confirmed by operation. Of the 23 patients, 14 cases were malignancy, 9 cases were benign. It's showed barium meal study and enteroclysis (small bowel enema) with air-barium double-contrast technique are of diagnostic value in incomplete small bowel obstruction due to small bowel diseases. Among 23 patients, the X-ray of 19 cases consistent with pathological results, with the diagnostic accuracy rate 82.6%. Barium sulfate is an insoluble salt commonly used in radiologic studies and generally is considered a low-risk contrast agent [5]. One systematic review only found 32 reported cases of bowel obstruction caused by barium retention that occurred over a 56-year period. The risk factors include advanced age, electrolyte imbalances, dehydration, and changes to intestinal anatomy narrowing the lumen, and any drugs or medical conditions affecting colon motility (systemic lupus erythematosus, diabetes, scleroderma, Ogilvie's syndrome). Nearly half of the cases present symptoms within the first 4 weeks after barium meal tests. However, it may take up to 2 years for this to be detected [6]. In this case, the patient, with bile duct cancer and metal stent, suffered from intestinal obstruction due to barium retention after small bowel radiography of oral barium. Next, it was invalid to give this patient oral mosapride and cleaning enema includes liquid paraffin oil and compound polyethylene glycol. This patient was advised to take the barium out by colonoscopy or operation, however, she refused. Finally, she died of MODS. This rare case is the first report in our hospital. The risk factors for intestinal obstruction may be include advanced age, advanced bile duct cancer, bowel dysfunction, long term in bed, electrolyte disorder and the reduce of digestive fluid due to octreotide. Methods used to relieve barium retention included manual extraction, enemas, laxatives, and endoscopy. Colonoscopic dissolution was achieved using either high-pressure jet stream, prolonged water irrigation, or combined mechanical irrigation. Nearly half of the patients required surgery, ranging from colon incision with barium removal to pancolectomy with ileostomy. Considering the high morbidity of barium retention to intestinal obstruction, efforts should be made to reduce this complication. If patients have risk factors of intestinal obstruction after barium exams, they should be educated and encouraged to drink more water, have liquid diet, and have intestinal motility drugs or laxatives. Their defecation condition should be observed and abdominal X-ray examination or further treatments should be performed. Besides, the elderly still need exercise as early as possible.

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