

Ileal Duplication Cyst: The Importance of Sodium Pertechnetate Tc 99m Scanning

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Abstract. Duplications of the alimentary tract may cause extensive bleeding when ectopic gastric mucosa is present. A successful diagnosis can be made preoperatively with the use of conventional barium studies as well as sodium pertechnetate Tc 99m scans.

Key words: Congenital enteric duplication - Rectal bleeding - Nuclear scanning

Ileal duplication cysts most commonly present as a palpable mass with or without vomiting during the first year of life [1]. Blood in the stool is an uncommon feature of these masses since only a small percentage communicate with the bowel.

Nevertheless, if rectal bleeding occurs in infancy or childhood, enteric duplication cysts must be considered in the differential diagnosis as well as the more common causes of rectal bleeding such as a Meckel's diverticulum, juvenile polyps, anal fissures, colitis, intussusception and hemorrhoids.

Sodium pertechnetate Tc 99m localizes in the mucussecreting cells of gastric mucosa. A large percentage of ileal duplication cysts contain ectopic gastric mucosa and gastric mucosa is invariably found in patients with symptoms [2]. This nuclide examination is an established procedure in the work-up of rectal bleeding.

Case Report

A previously healthy 4½-year-old boy had his first episode of tarry stools in July 1975; hemoglobin fell to 6.0 gm%. He was admitted to a local hospital where he required two blood transfusions. A barium enema and upper gastrointestinal series were interpreted as normal.

He had no recurrence for the next six months until two weeks prior to his first admission at The Mount Sinai Hospital when he again had an episode of tarry stools with no significant decrease in hemoglobin. During this admission, a film of the small bowel series revealed an unusual mass in the right lower quadrant which had a pattern of rugal folds (Fig. 1). Subsequent 105 mm compression studies of this area did not demonstrate any masses. A normal terminal ileum and cecum were seen. Endoscopy of the colon and sodium pertechnetate Tc 99m scans were reported as normal. Clotting studies were also normal as were stool cultures.

A third episode of tarry stools occurred four months later and the child was readmitted immediately to Mt. Sinai Hospital where his hemoglobin level dropped from 11.0 gm% to 7.0 gm%, necessitating a blood transfusion. A repeat barium enema was normal but the upper gastrointestinal-small bowel study demonstrated a large mass lesion, contiguous with the ileum, located in the pelvis. This mass, proximal to the terminal ileum, was filled with smooth, multiple, large polypoid defects. After the intravenous injection of 2 mCi of sodium pertechnetate Tc 99m, a repeat sequential-timed nuclear scan of the abdomen was obtained. The 5 minute scan demonstrated an abnormal area of uptake in the region of the pelvis that was consistent with ectopic gastric mucosa and, in fact, resembled gastric rugae. A 30 minute scan showed the bladder overlying this area of abnormal uptake in the pelvis (Fig. 2 A and B).

At laparotomy, a grapefruit-sized duplication cyst of the distal ileum was apparent. This mass was located on the mesenteric side of the bowel, communicated with the ileum and shared a common blood supply. The lesion was excised as was the ileum distal to the mass since two large ulcerations were found in the adjacent bowel wall. Gross and microscopic examination of the specimen showed a smooth muscle wall and a well developed gastric mucosa lining the entire cyst. Postoperatively, the child did well and has had no further rectal bleeding.

Discussion

Enteric duplication cysts may be found anywhere from the base of the tongue down to the anus and are probably related to incomplete closure of neuroenteric openings during the blastocyst

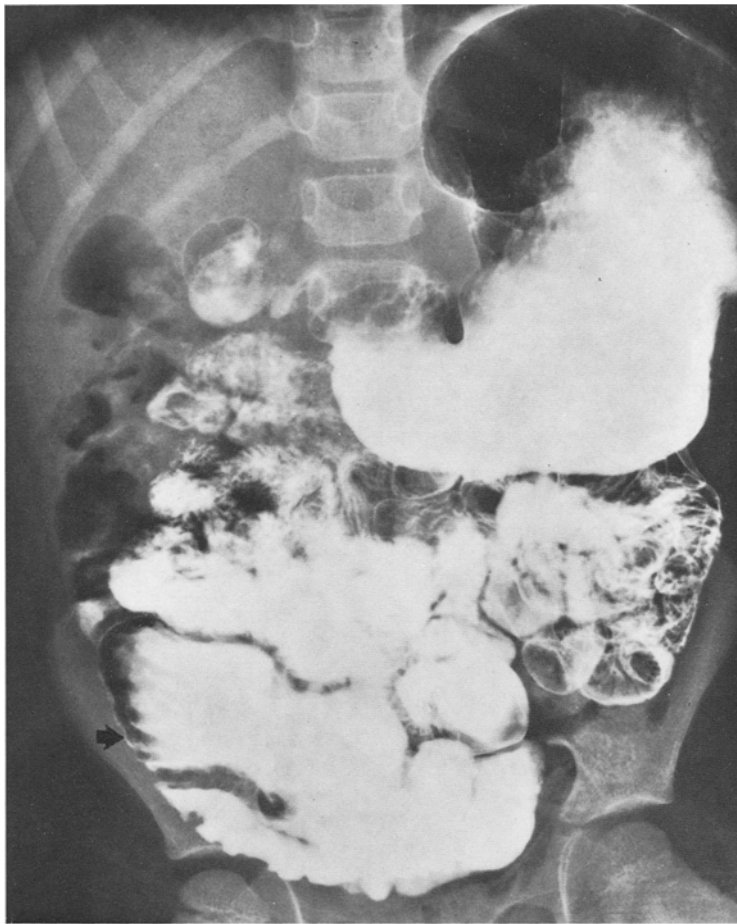


Fig. 1. One hour film of a small bowel series shows a barium filled blind sac in the right lower quadrant with a rugal pattern (arrow)

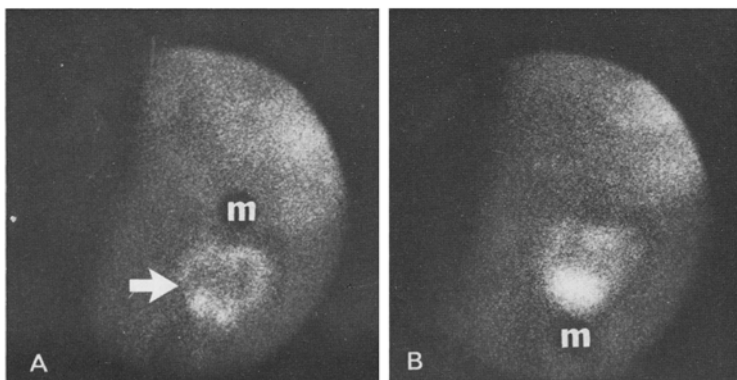


Fig. 2. **A** Anterior view of the abdomen at 5-minutes after injection of sodium pertechnetate Tc 99m with marker (m) at umbilicus. Note increased focal activity (arrow) in pelvic area reminiscent of gastric rugae. **B** Anterior view of abdomen at 30-minutes with marker (m) at symphysis pubis. Urinary bladder and abnormal area of uptake are superimposed

stage. The most frequent location of these lesions is the ileum (55%); the next most common locations are the esophagus and duodenum [1].

Radiographic techniques including plain films and contrast studies of the intestinal tract are normal in approximately 20% of patients. Therefore, nuclear scanning should be included in the investigation of children with rectal bleeding. Ectopic gastric mucosa appears to concentrate sodium pertechnetate Tc 99m in the same

manner as normal gastric mucosa. The calculated sensitivity of this test for the detection of Meckel's diverticulum is 75% [3]. This is often the primary problem in differential diagnosis.

Nuclear scanning, either with a rectilinear scanner or scintillation camera, should be obtained during injection (flow views) as well as after injection with sequential-timed imaging up to 45 minutes, without moving the patient. The field of imaging should include both the stomach and

urinary bladder so that any abnormal uptake of the isotope should not be overlooked [4].

In our case, two problems in interpretation occurred. Firstly, the small bowel study in January 1975 revealed a characteristic gastric mucosal relief pattern in the right lower quadrant. Although this could not be confirmed by fluoroscopy, probably due to rapid emptying of the congenital duplication, findings such as this have been reported [5]. Secondly, the isotopic study demonstrated a multilobulated mass in the region of the bladder during early imaging. This should have been interpreted as gastric mucosa both because of its unique pattern and the time sequence of the scans. On the delayed scans, the bladder was identified as a definite homogenous structure overlying the radioactivity in the ectopic gastric mucosa which was the ileal duplication.

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Date of final acceptance: June 14, 1977

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