Case 523

Enterolithiasis
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Section: Abdominal imaging
Imaging Technique: Ultrasound
Imaging Technique: MR
Case Type: Clinical Cases
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Patient: 73 years, female

Clinical History:

Diffuse abdominal pain in a 73 year old female patient with a previous history of Crohn disease. Images include: barium enema (performed when Crohn disease was diagnosed), abdominal US, IVU and small bowel follow through meal.

Imaging Findings:

Diffuse abdominal pain in a 73 year old woman with a previous history of Crohn disease at the age of 56 years old. Double-contrast barium enema (performed at the age of 56 years old), abdominal US, IVU, small bowel follow through meal. The decubitus view of the barium enema shows a long stenosed colonic segment. The radiological findings confirmed the clinical diagnosis of Crohn disease, from which the patient recovered. Several years later the patient presented with diffuse abdominal pain and an abdominal US examination was performed. The sagittal image of the pelvis show a hyperechoic mass related to the bladder, for which a diagnosis of vesical calculi was posed, and the patient underwent an IVU examination. The supine pre-contrast abdominal view shows multiple abdominal calcifications (due to calcified ileal lymphnodes) and other calcification overlapping the right femural head. The 15 minutes post-contrast image shows that these latter calcifications have a different position, thus a diagnosis of multiple ileal calcifications (enteroliths) was posed, thus the patient underwent a small bowel follow through meal, which confirmed the diagnosis of enteroliths in the distal ileum, without obstruction. The abdominal pain resolved by itself and surgery was proposed to remove the calcification, which the patient refused.

Discussion:

We have found less than a hundred reports of enterolithiasis in the past medical literature, and only 17 associated with Crohn’s disease. The earliest case of enteroliths acknowledged in the twentieth century was reported in 1908, and Pfahler and Stamm described the first in the radiological literature in 1915. It is quite likely that many cases of enterolithiasis have not been reported and that others have remained asymptomatic and thus have not be detected, but it also likely that some have been misinterpreted as gallstones in the intestinal tract or faecoliths in the appendix.

Calcifications in the intestinal tract can be classified as primary (or enteroliths) or secondary, according to their origin: secondary calcifications are represented by gallstones entering the intestine via the common duct or via a fistula between the biliary tree and the gastrointestinal tract. Enteroliths were subdivided by Grettve into true and false ones. The clumping together of large amounts of insoluble ingested material forms false enteroliths or these may form by inspissation of intestinal contents (tricho-bezoars, phyto-bezoars and faecoliths). True enteroliths are formed as a result of the precipitation and deposition of substances present in the normal alimentary. They may be categorised by their biochemical composition into those consisting primarily of bile salts and those in which mineral salts predominate. Compounds including calcium carbonate, calcium oxalate, and rarely magnesium or barium sulphate may be present. The chemical conditions favourable to the production of enteroliths within the intestinal
tract are always present, as a high proportion of easily precipitable material exists within the intestinal contents, however, normal peristaltic activity propels and evacuate such material before concretion can occur. The presence of chronic stasis secondary to intestinal diverticula and bowel strictures is therefore crucial for enterolith formation, as it happened in the case we describe. The chemical composition of enteroliths depends on their site of formation and the acidity or alkalinity of intestinal chyme at that location. The relatively high acidity of the proximal duodenum and jejunum allows precipitation of bile acids, especially choleic acid. If a condition of stasis is present, such as within a jejunal diverticulum or duodenal loop after gastroenterotomy, then choleic acid stones may form, but these are radiolucent. Enteroliths found in the ileum and colon usually contain radiopaque mineral salts because of their relative insolubility in the alkaline pH present there. A central core or nidus may be present although enteroliths without such a nucleus are also common. Despite the fact that the small bowel content has a liquid consistency, enterolith formation is much more frequent in the distal ileum than the adjacent colon, where water reabsorption takes place. This may be in part due to the smaller calibre of the ileum where intestinal calculi can more readily cause obstruction, while many colonic enteroliths may remain asymptomatic or be passed spontaneously. A wide spectrum of intestinal disorders are associated with functional or organic lesions which cause prolonged stasis necessary for production of enteroliths. Enterolithiasis in Crohn’s disease is rare: it may present as small bowel obstruction in patients with long standing strictures, and in these class of patients it would be rare to detect an enterolith during the initial presentation of inflammatory bowel disease. Patients with Crohn’s disease also have an increased incidence of gallstones which is thought to be related to the depletion of the bile salt pool as a consequence of terminal ileal disease, although other mechanisms may be important. Gallstones can pass in the small bowel via the common duct or via a fistulous tract and impact in the bowel, usually at the ileo-caecal valve. In conclusion the discovery of radiopaque enteroliths on plain films of the abdomen could initially pose a diagnostic dilemma. Enteroliths are usually oval or round and may be laminated or homogeneously calcified. Enteroliths must be differentiated from the intra-abdominal calcification including gallstones, calcifications in the pancreas, calcified mesenteric lymph nodes, ovarian and uterine calcifications, calcification in an echinococcus cysts, calculi in the urinary tract, calcified vascular aneurysms and other less common causes. Our experience and the current literature indicates that a cluster of laminated calculi in the mid- or lower abdomen is highly suggestive of enterolithiasis located within a Meckel’s diverticulum or proximal to post-inflammatory intestinal strictures. Barium studies of the small bowel and colon should be performed to determine the precise location of the calculi as well as the nature and extent of associated pathological processes. Enterolithiasis should be considered in any patient with a long-standing history of Crohn’s disease presenting with single or multiple calcifications, with or without abdominal symptoms.

**Differential Diagnosis List:** Enteroliths of the small bowel

**Final Diagnosis:** Enteroliths of the small bowel

**References:**


Description: Stenotic segment in the transverse colon

Origin:
**Description:** Hyperechoic 19 mm mass related to the posterior bladder wall

**Origin:**
Description: Multiple abdominal calcifications (ileal lymphnodes) and other calcifications with translucent center which overlap the right femural head Origin:
**Description:** IVU 15 minutes post contrast supine image: three abdominal calcifications with translucent center, in a different position than the previous image.

**Origin:**
Figure 4

**Description:** Partially translucent mobile masses in the distal ileum

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Origin: