Capsule endoscopy device retention and magnetic resonance imaging

Bradley W. Anderson, MD, Jackson J. Liang, DO, and Ramona S. DeJesus, MD

A 55-year-old man was hospitalized for a neurologic and infectious workup after having hallucinations and productive cough for 2 days. During hospitalization, he experienced dark stools with an acute drop in hemoglobin. Upper endoscopy and colonoscopy were negative for an identifiable source of bleed. Capsule endoscopy was later done and subsequently an anteroposterior abdominal radiograph confirmed the presence of a retained capsule near the junction of the descending and distal transverse colon, likely contained within a colonic diverticulum. In the interim, the patient developed acute right-sided lumbar radiculopathy prompting emergent lumbar spine magnetic resonance imaging (MRI). During the scanning process, the retained capsule was seen and the test was immediately terminated without harm to the patient. Device retention is a complication unique to capsule endoscopy, occurring at a rate of 1% to 1.7%; retained devices are considered a danger and contraindication to MRI.

Capsule endoscopy, a noninvasive method for diagnosis of small bowel pathology, can be complicated by retention of the capsule. This report describes a patient with a capsule that was incidentally seen during magnetic resonance imaging (MRI).

CASE DESCRIPTION

A 55-year-old man with primary progressive multiple sclerosis and prior pulmonary embolism on chronic anticoagulation was hospitalized for a neurologic and infectious workup after presenting with a 2-day history of hallucinations and productive cough. Following 6 days of hospitalization, the patient noted dark feces accompanied by an acute drop in hemoglobin (from 9.0 to 7.4 g/dL) and positive HemoQuant (>15.6 g Hb/g; normal ≤ 2 g Hb/g). One unit of packed red blood cells was transfused, and an upper endoscopy was performed without finding an identifiable source of bleed. A colonoscopy visualized no bleeding source up to 15 cm from the ileocecal valve. Computed tomography (CT) enterography noted three subcentimeter enhancing distal ileal lesions radiographically suspicious for carcinoid. To further characterize these lesions, a capsule endoscopy was pursued. Three days after the procedure, the patient had not reported capsule passage despite several bowel movements. An anteroposterior abdominal radiograph disclosed

a retained capsule adjacent to the proximal descending and distal transverse colon, likely contained within a colonic diverticulum (Figure 1).

The following day, the patient developed acute right-sided lumbar radiculopathy associated with severe pain. Emergent MRI of the lumbar spine was ordered. During performance of the MRI localizing sequence, a focal susceptibility effect was noted in the region of the pelvis (Figure 2). Prompt investigation by the radiology staff correlated this finding to the prior radiographic report demonstrating the retained capsule. The procedure was immediately terminated without harm to the patient. The large hemoglobin drop was attributed to a large gluteal hematoma identified on a subsequent CT scan. Two days later, the capsule was passed; upon review of the capsule study, no significant pathology was demonstrated to further characterize the suspicious lesions previously noted on CT imaging.

Figure 1. Anteroposterior abdominal x-ray image visualizing an endoscopy capsule adjacent to the proximal descending and distal transverse colon, likely within a colonic diverticulum (arrow).

From the Department of Medicine, Mayo Clinic, Rochester, MN.

Corresponding author: Bradley W. Anderson, MD, Department of Medicine, Mayo Clinic, 200 1st Street SW, Rochester, MN 55905 (e-mail: Anderson.Bradley@mayo.edu).

Figure 2. MRI image (coronal view 3-plane T2 single-shot fast spin echo) demonstrating a susceptibility corresponding to retained endoscopy capsule (arrow) with interval migration to the region of the sigmoid colon.

DISCUSSION

Device retention is a complication unique to capsule endoscopy. Recent studies have reported the rate of retention to be

between 1.0% and 1.7% of patients undergoing the diagnostic procedure (1, 2). Common factors that predispose individuals to device retention include Crohn's disease, neoplastic lesions, non-steroidal antiinflammatory drug-induced enteropathy, stenosis, and adhesions (1). The appearance of retained capsules on MRI has been previously documented (3). The feared possible complication of MRI with capsule retention is migration of the capsule and the potential for bowel injury or perforation. We were unable to identify a prior case report that described patient injury in the setting of retained capsules during MRI, but retained devices are considered a danger and contraindication to MRI (4). While this case represents a near-miss of such an event, it highlights the need for enhanced provider awareness as well as institutional safeguards against ordering MRI studies prior to the confirmed passage of an endoscopic capsule. Confirmation of device passage is quickly achieved through abdominal radiographic imaging and should be employed in circumstances where suspicion remains for retention.

1. Liao Z, Gao R, Xu C, Li ZS. Indications and detection, completion, and retention rates of small-bowel capsule endoscopy: a systematic review. *Gastrointest Endosc* 2010;71(2):280–286.
2. Li F, Gurudu SR, De Petris G, Sharma VK, Shiff AD, Heigh RI, Fleischer DE, Post J, Erickson P, Leighton JA. Retention of the capsule endoscope: a single-center experience of 1000 capsule endoscopy procedures. *Gastrointest Endosc* 2008;68(1):174–180.
3. Berry PA, Srirajaskanthan R, Anderson SH. An urgent call to the magnetic resonance scanner: potential dangers of capsule endoscopy. *Clin Gastroenterol Hepatol* 2010;8(5):A26.
4. Gaba RC, Schlesinger PK, Wilbur AC. Endoscopic video capsules: radiologic findings of spontaneous entrapment in small intestinal diverticula. *AJR Am J Roentgenol* 2005;185(4):1048–1050.