contrast enhancement, fat densification, adjacent fluid collections, or free fluid(3).

The definitive treatment for MD is surgery, which is always indicated in symptomatic patients. The approach can be by laparoscopy or laparotomy, which provide equally satisfactory results(12).

The data presented here underscore the importance of diagnostic suspicion for the identification of Meckel’s diverticulitis. In patients with nonspecific abdominal symptoms, radiologists must be familiar with the imaging aspects of MD in order to interpret the imaging studies correctly.

REFERENCES
1. Satya R, O’Malley JP. Case 86: Meckel diverticulum with massive bleeding. Radiology. 2005;236:836–40.
2. Fink AM, Alexopoulou E, Carty H. Bleeding Meckel’s diverticulum in infancy: unusual scintigraphic and ultrasound appearances. Pediat Radiol. 1995;25:155–6.
3. Levy AD, Hobbs CM. From the archives of the AFIP. Meckel diverticulum: radiologic features with pathologic correlation. Radiographics. 2004;24:565–87.
4. Arnold JF, Pellicane JV. Meckel’s diverticulum: a ten-year experience. Am Surg. 1997;63:354–5.
5. Kotha VK, Khandelwal A, Saboo SS, et al. Radiologist’s perspective for the Meckel’s diverticulum and its complications. Br J Radiol. 2014;87:20130743.
6. Naves AA, D’Ippolito G, Souza LRMF, et al. What radiologists should know about tomographic evaluation of acute diverticulitis of the colon. Radiol Bras. 2017;50:126–31.
7. Lapa CB, Freire EC, Indiani JMC, et al. Pseudocyst in ectopic pancreas: diagnosis and percutaneous treatment guided by MDCT. Radiol Bras. 2018;51:207–8.
8. Queiroz RM, Sampaio FDC, Marques PE, et al. Pyelonephritis and septic thrombosis of the inferior mesenteric vein secondary to diverticulitis. Radiol Bras. 2018;51:336–7.
9. Nery DB, Costa VB, Musi TC, et al. Epidemiological and imaging features that can affect the detection of ureterolithiasis on ultrasound. Radiol Bras. 2018;51:287–92.
10. Mizukowski MD, Spolidoro JVN, Epifanio M, et al. Color Doppler of Meckel’s diverticulum: report of two cases. Radiol Bras. 2011;44:268–70.
11. Paulsen SR, Huprich JE, Fletcher JG, et al. CT enterography as a diagnostic tool in evaluating small bowel disorders: review of clinical experience with over 700 cases. Radiographics. 2006;26:641–57.
12. Up할 K, Tubbs RS, Matusz P, et al. Meckel’s diverticulum: a review. Clin Anat. 2011;24:416–22.

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Subacute cortical infarct: the value of contrast-enhanced FLAIR images in inconclusive DWI

Dear Editor,

A 44-year-old patient presented with axial sensorimotor deficit, dating back approximately 10 days. The history was significant for diabetes, alcoholism, and cognitive impairment, making it difficult to assess the recent history and symptoms. The patient was submitted to brain magnetic resonance imaging (MRI) with T2-weighted imaging (T2WI), fluid-attenuated inversion recovery (FLAIR) sequences, susceptibility weighted imaging, and diffusion-weighted imaging (DWI), as well as T1-weighted imaging (T1WI), before and after intravenous gadolinium administration, in the axial, sagittal, and coronal planes. In the right postcentral gyrus, MRI revealed a cortical lesion, which showed a hyperintense signal on FLAIR image (Figure 1A). The lesion could be due to a new or older infarct. However, there was no restricted diffusion suggestive of a recent infarct (Figures 1B and 1C). Contrast-enhanced FLAIR imaging revealed marked cortical enhancement in the right postcentral gyrus, consistent with a subacute cortical infarct (Figure 1D).

Diabetes mellitus is a well-recognized risk factor for ischemic stroke, which is a leading cause of death and disability. MRI is quite sensitive in detecting ischemic changes. T2WI is more sensitive than T1WI, and T1WI after gadolinium administration can provide valuable information for the accurate diagnosis(12). Intravascular enhancement, although not specific, is considered a sign of ischemia on conventional MRI. Contrast enhancement

Figure 1. A: Axial FLAIR image. Note the subtly hyperintense signal in the anterior cortex of the postcentral gyrus. B, C: Corresponding axial DWI (B) and ADC map (C). There is a barely discernible hyperintense signal on DWI, although there is no evidence of low signal intensity on the ADC map (i.e., there is no restricted diffusion in the region). D: Gadolinium-enhanced FLAIR image showing marked contrast uptake in the affected area of the postcentral gyrus.

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in the central nervous system is the result of a combination of disruption of the blood-brain barrier, high vascularity, and contrast leakage into the lymphatic system\(^3\). After one week, infarcts show parenchymal enhancement, due to breakdown of the blood-brain barrier\(^7\).

New imaging techniques, such as DWI and perfusion-weighted imaging, have increased the accuracy of the diagnosis of acute cerebral ischemia, although there are some cases in which it cannot be distinguished from other entities\(^8,9\). In addition, because of pseudonormalization, subacute infarcts may not show restricted diffusion on DWI.

FLAIR is highly sensitive for the detection of ischemic lesions. Although it is considered to be heavily T2-weighted, rendering cerebrospinal fluid as dark, it also shows mild contrast enhancement on T1WI, which is responsible for the increased conspicuity of gadolinium enhancement. Pathologic conditions that present contrast enhancement on T1WI, usually show marked enhancement on contrast-enhanced FLAIR\(^10\). This is exactly what occurred in the case presented here, in which DWI pseudonormalization did not help reveal the subacute cortical infarct. When a subacute cortical infarct is suspected, delayed contrast-enhanced FLAIR imaging is the best choice for demonstrating the lesion and for differentiating it from an older lesion with gliosis.

REFERENCES
1. Yuh WT, Crain MR, Loes DJ, et al. MR imaging of cerebral ischemia: findings in the first 24 hours. AJNR Am J Neuroradiol. 1991;12:621–9.
2. Weinmann HJ, Brusch RC, Press WR, et al. Characteristics of gadolinium-DTPA complex: a potential NMR contrast agent. AJR Am J Roentgenol. 1984;142:619–24.
3. Bozzao A, Floris R, Fasoli F, et al. Cerebrospinal fluid changes after intravenous injection of gadolinium chelate: assessment by FLAIR MR imaging. Eur Radiol. 2003;13:592–7.
4. Fukuoaka H, Hirai T, Okada T, et al. Comparison of the added value of contrast-enhanced 3D fluid-attenuated inversion recovery and magnetization-prepared rapid acquisition of gradient echo sequences in relation to conventional postcontrast T1-weighted images for the evaluation of leptomeningeal diseases at 3T. AJNR Am J Neuroradiol. 2010;31:868–73.
5. Sage MR, Wilson AJ, Scroop R. Contrast media and the brain. The basis of CT and MR imaging enhancement. Neuroimaging Clin N Am. 1998;8:695–707.
6. Smirniotopoulos JG, Murphy FM, Rushing EJ, et al. Patterns of contrast enhancement in the brain and meninges. Radiographics. 2007;27:525–51.
7. Karonen JO, Partanen PL, Vanninen RL, et al. Evolution of MR contrast enhancement patterns during the first week after acute ischemic stroke. AJNR Am J Neuroradiol. 2001;22:103–11.
8. Beaulieu C, de Crespiigny A, Tong DC, et al. Longitudinal magnetic resonance imaging study of perfusion and diffusion in stroke: evolution of lesion volume and correlation with clinical outcome. Ann Neurol. 1999;46:568–78.
9. Sorensen AG, Copen WA, Ostergaard I, et al. Hyperacute stroke: simultaneous measurement of relative cerebral blood volume, relative cerebral blood flow, and mean transit time. Radiology. 1999;210:519–27.
10. Lee EE, Lee EJ, Kim S, et al. Importance of contrast-enhanced fluid-attenuated inversion recovery magnetic resonance imaging in various intracranial pathologic conditions. Korean J Radiol. 2016;17:127–41.

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Transmural migration of a gossypiboma: a rare cause of intestinal obstruction

Dear Editor,

An 83-year-old man presented to the emergency department with an approximately one-month history of diffuse abdominal pain, nausea, bilious vomiting, and abdominal distension, the symptoms worsening in the last three days. He reported having lost 6 kg since the onset of symptoms. Six months prior, he had undergone cholecystectomy at another facility. On physical examination, the abdomen was slightly rounded, with increased bowel sounds, and was painful to superficial palpation in the midabdominal region, characteristic of a foreign body (gossypiboma). An air-fluid level and serpiginous radiopaque areas in the duodenal region, characteristic of a foreign body (gossypiboma) was confirmed intraoperatively (Figure 1D). The gossypiboma, which was located in the first portion of the duodenum, resulted in gastric outlet obstruction and gastric dilatation. Acute abdominal conditions have been the subject of various recent studies in the radiology literature of Brazil\(^5\). Gossypibomas have been identified in 0.02–0.1% of patients undergoing abdominal surgery\(^6\). Transmural migration of a gossypiboma is extremely rare. When it does occur, it is typically in the bowel, bladder, or chest. Spontaneous expulsion of a gossypiboma has been reported in only a few cases, the mean time from surgery to diagnosis being 2.2 years\(^5,6\).

Two types of reactions to foreign bodies have been described in the literature: fibroblastic and exudative. An aseptic fibrous response results in adhesion, encapsulation, and granuloma, usually remaining asymptomatic or causing chronic progressive symptoms over months to years. An exudative reaction causes the formation of a cyst or abscess that can establish fistulas to adjacent organs, the symptoms being more severe in such cases\(^5,7\). The increase in intra-abdominal pressure caused by a gossypiboma can result in partial or total necrosis of the intestinal wall\(^5,7\).

The imaging findings preceding transmural migration of a gossypiboma are variable, depending on the nature of the sponge, its radiopaque marker, the length of time the foreign body has been present, and the type of reaction to it. A CT scan can reveal a poorly defined, heterogeneous mass, containing metallic wires...