

allow the optimization of protocols promoting good practices, offering greater effectiveness to the professionals involved and allowing better results, with potentially greater safety for patients.

REFERENCES

1. Jones DB, Sung R, Weinberg C, et al. Three-dimensional modeling may improve surgical education and clinical practice. *Surg Innov*. 2016; 23:189–95.
2. Wu C, Tan L, Lin X, et al. Clinical application of individualized reference model of sagittal curves by three-dimensional printing technique and computed-aided navigation system for lumbar spondylolisthesis. *Zhongguo Xiu Fu Chong Jian Wai Ke Za Zhi*. 2015;29:734–40.
3. Chen X, Zhang G, Lin H, et al. Digital design of standard parts database for proximal tibia fractures treated with plating via three-dimensional printing. *Zhongguo Xiu Fu Chong Jian Wai Ke Za Zhi*. 2015;29:704–11.
4. Mowry SE, Jammal H, Myer C 4th, et al. A novel temporal bone simulation model using 3D printing techniques. *Otol Neurotol*. 2015;36:1562–5.
5. Xu N, Wei F, Liu X, et al. Reconstruction of the upper cervical spine using a personalized 3D-printed vertebral body in an adolescent with Ewing sarcoma. *Spine (Phila Pa 1976)*. 2016;41:E50–4.
6. Werner H, Rolo LC, Araujo Júnior E, et al. Manufacturing models of

- fetal malformations built from 3-dimensional ultrasound, magnetic resonance imaging, and computed tomography scan data. *Ultrasound Q*. 2014;30:69–75.
7. Werner Jr H, Santos JL, Belmonte S, et al. Applicability of three-dimensional imaging techniques in fetal medicine. *Radiol Bras*. 2016;49:281–7.
8. Araujo Júnior E. Three-dimensional ultrasound in fetal medicine after 25 years in clinical practice: many advances and some questions. *Radiol Bras*. 2016;49(5):v–vi.
9. AbouHashem Y, Dayal M, Savanah S, et al. The application of 3D printing in anatomy education. *Med Educ Online*. 2015;20:29847.

Francisco Abaeté Chagas-Neto¹, Francisco Coracy Carneiro Monteiro², Eduardo Lima da Rocha³, Everaldo Gregio-Junior⁴, Marcelo Henrique Nogueira-Barbosa⁴

1. Centro Universitário Christus (Unichristus) e Hospital Antônio Prudente, Fortaleza, CE, Brazil. 2. Hospital Albert Sabin, Fortaleza, CE, Brazil. 3. Hospital Antônio Prudente, Fortaleza, CE, Brazil. 4. Faculdade de Medicina de Ribeirão Preto da Universidade de São Paulo (FMRP-USP), Ribeirão Preto, SP, Brazil. Mailing address: Dr. Francisco Abaeté Chagas-Neto. Rua João Adolfo Gurgel, 133, Coco. Fortaleza, CE, Brazil, 60192-345. E-mail: fabaeteneto@gmail.com.

<http://dx.doi.org/10.1590/0100-3984.2015.0208>

Subcapsular splenic hematoma and spontaneous hemoperitoneum in a cocaine user

Dear Editor,

A 23-year-old male patient presented with a 36-h history of intense, sudden, progressive abdominal pain, predominantly in the left hypochondrium, irradiating to the ipsilateral infrascapular region. He reported no previous trauma, fever, headache, fatigue, myalgia, arthralgia, skin alterations, or comorbidities. During the clinical interview, he reported moderate smoking and the routine use of an illicit drug (cocaine), including hours prior to the onset of pain. On physical examination, he was well-oriented, hemodynamically stable, and afebrile. The serology was negative for hepatitis B, hepatitis C, and dengue, and the results were normal for antineutrophil cytoplasmic antibody, antinuclear factor, the venereal disease research laboratory test, urea, creatinine, erythrocyte sedimentation rate, C-reactive protein, and coagulation profile. Hemoglobin electrophoresis showed no alterations.

Computed tomography (CT) showed a dense collection, compatible with hematic material, in close proximity to the spleen, as well as showing hemoperitoneum (Figure 1). Arteriography showed no abnormalities. Exploratory laparotomy revealed subcapsular splenic hematoma and confirmed the hemoperitoneum, with no evidence of a lesion within the cavity.

Given that there was no perisplenic trauma or adhesions suggestive of previous trauma and that the macroscopic aspect of the spleen was normal on the CT scan and in the exploratory laparotomy, together with the facts that diseases affecting the splenic parenchyma were ruled out and that the patient had used cocaine immediately prior to the episode, we established the working diagnosis of nontraumatic splenic hemorrhage secondary to cocaine use. During clinical follow-up, the patient progressed well, without complications.

Recent studies in the radiology literature of Brazil have emphasized the importance of CT and magnetic resonance imaging scans to improving the diagnosis in nontraumatic abdominal disorders^(1–5). Splenic hemorrhages are rarely encountered without prior trauma and can have fatal consequences, which makes their early diagnosis essential. The main nontraumatic conditions include neoplasms, as well as inflammatory/infectious, iatrogenic, and mechanical processes⁽⁶⁾.

The clinical signs of nontraumatic splenic hemorrhage are similar to those found in cases resulting from trauma, including pain in the upper left quadrant, with or without irradiation to the left shoulder, caused by diaphragmatic irritation, evolving to hemodynamic instability in the most severe cases. Such manifestations are nonspecific and cannot be characterized solely by physical examination. Therefore, in hemodynamically stable patients,

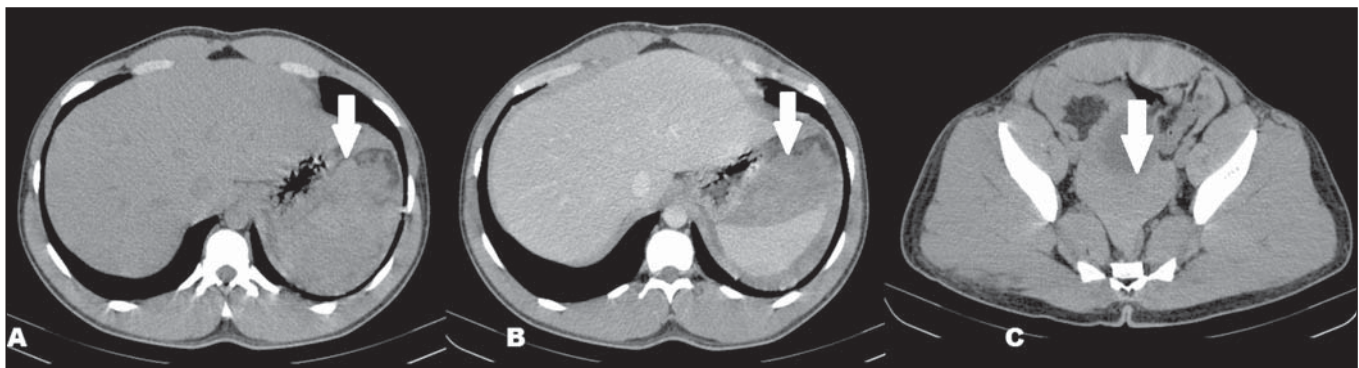


Figure 1. CT scan showing subcapsular hematoma and hemoperitoneum. **A:** CT, axial slice, without contrast, demonstrating dense collections (arrow) adjacent to the spleen. **B:** Contrast-enhanced axial CT, showing the dense collections adjacent to the spleen (arrow), without contrast enhancement, indicative of subcapsular hematoma. **C:** CT, axial slice, without contrast, demonstrating spontaneously dense free liquid in the pelvis (arrow), indicative of hemoperitoneum.

CT evaluation is fundamental to the characterization of the affected organs^(6,7).

Currently, Brazil is the second largest consumer of cocaine and its derivatives, the leader being the United States⁽⁸⁾. The mechanism thought to trigger bleeding during or after cocaine use is stimulation of alpha-adrenergic receptors, which produce vasoconstriction with a consequent increase in abdominal blood pressure and a reduction of up to 20% of the splenic volume, promoting high-pressure blood flow in a retracted parenchyma and with a low concentration of connective tissue, making the spleen more prone to bleeding, which can be triggered even by coughing^(6,9).

In nontraumatic splenic hemorrhage, the differential diagnoses include dengue, infectious mononucleosis, polyarteritis nodosa, segmental arterial mediolysis, neoplasms, coagulopathy, and hemoglobinopathy^(6,7,9-11).

In conclusion, although nontraumatic splenic hemorrhage is uncommon, the possibility of cocaine use as a triggering event should be considered, especially in young, previously healthy patients with no comorbidities to explain such an event.

REFERENCES

1. Rocha EL, Pedrassa BC, Bormann RL, et al. Abdominal tuberculosis: a radiological review with emphasis on computed tomography and magnetic resonance imaging findings. *Radiol Bras.* 2015;48:181-91.
2. Barros RHO, Penachim TJ, Martins DL, et al. Multidetector computed tomography in the preoperative staging of gastric adenocarcinoma. *Radiol Bras.* 2015;48:74-80.
3. Bormann RL, Rocha EL, Kierzenbaum ML, et al. The role of gadoteric acid as a paramagnetic contrast medium in the characterization and detection of focal liver lesions: a review. *Radiol Bras.* 2015;48:43-51.
4. Fernandes DA, Kido RYZ, Barros RHO, et al. Immunoglobulin G4-related disease: autoimmune pancreatitis and extrapancreatic manifestations. *Radiol Bras.* 2016;49:122-5.

5. Fajardo L, Ramin GA, Penachim TJ, et al. Abdominal manifestations of extranodal lymphoma: pictorial essay. *Radiol Bras.* 2016;49:397-402.
6. Azar F, Brownson E, Dechert T. Cocaine-associated hemoperitoneum following atraumatic splenic rupture: a case report and literature review. *World J Emerg Surg.* 2013;8:33.
7. Lin WY, Lin GM, Chang FY. An unusual presentation of scrub typhus with atraumatic hemoperitoneum. *Am J Gastroenterol.* 2009;104:1067.
8. Laranjeira R, Madruga CS, Pinsky I, et al. II Levantamento Nacional de Álcool e Drogas (LENAD) – 2012. São Paulo: Instituto Nacional de Ciência e Tecnologia para Políticas Públicas de Álcool e Outras Drogas (INPAD), Unifesp; 2014.
9. Carlin F, Walker AB, Pappachan JM. Spontaneous splenic rupture in an intravenous drug abuser. *Am J Med.* 2014;127:e7-8.
10. Mukhopadhyay M, Chatterjee N, Maity P, et al. Spontaneous splenic rupture: a rare presentation of dengue fever. *Indian J Crit Care Med.* 2014;18:110-2.
11. Michael M, Widmer U, Wildermuth S, et al. Segmental arterial mediolysis: CTA findings at presentation and follow-up. *AJR Am J Roentgenol.* 2006;187:1463-9.
12. Redondo MC, Ríos A, Cohen R, et al. Hemorrhagic dengue with spontaneous splenic rupture: case report and review. *Clin Infect Dis.* 1997; 25:1262-3.

Bruno Niemeyer de Freitas Ribeiro¹, Rafael Santos Correia¹, Tiago Medina Salata², Fernanda Salata Antunes², Edson Marchiori³

1. Instituto Estadual do Cérebro Paulo Niemeyer, Rio de Janeiro, RJ, Brazil. 2. Hospital Casa de Portugal / Clínica 3D Diagnóstico por Imagem, Rio de Janeiro, RJ, Brazil. 3. Universidade Federal do Rio de Janeiro (UFRJ), Rio de Janeiro, RJ, Brazil. Mailing address: Instituto Estadual do Cérebro Paulo Niemeyer – Departamento de Radiologia. Rua do Rezende, 156, Centro. Rio de Janeiro, RJ, Brazil, 20231-092. E-mail: bruno.niemeyer@hotmail.com.

<http://dx.doi.org/10.1590/0100-3984.2015.0203>

Intestinal strongyloidiasis: radiological findings that support the diagnosis

Dear Editor,

Two male patients, 38 and 32 years of age (patients 1 and 2, respectively), sought treatment with complaints and the clinical/biochemical profile described below. *Patient 1* – This patient complained of nausea and intermittent postprandial vomiting, for approximately two months, accompanied by mild abdominal pain, diarrhea, and weight loss. Physical examination revealed emaciation, with discrete edema of the lower limbs. Laboratory tests showed a low albumin level (0.9 g/dL) and an elevated level of C-reactive protein (31.4 mg/L). A computed tomography (CT) scan of the abdomen showed diffuse thickening of the intestinal wall

in segments of the small intestine, more accentuated in the region of the jejunum and the second portion of the duodenum, together with gastric distension, thickening (with enhancement) of the mucous membrane, dilation of the bile duct (Figure 1), and free fluid in the peritoneal cavity. *Patient 2* – This patient also complained of nausea and postprandial vomiting, accompanied by mild abdominal pain, for one month, exacerbated for one day. Physical examination revealed emaciation, with dull pain on abdominal palpation. Laboratory tests showed discrete leukocytosis without deviation, a low albumin level (2.2 g/dL), and an elevated level of C-reactive protein (65.1 mg/L). A CT scan showed accentuated thickening of the intestinal wall in segments of the jejunum, together with upstream gastric and duodenal dilation, discrete dilation of the bile duct, pneumobilia, and gaseous foci in

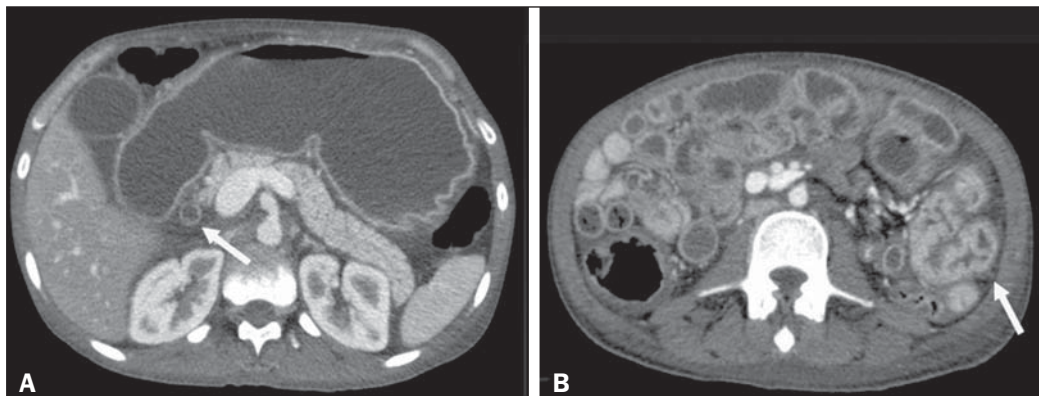


Figure 1. Intravenous contrast-enhanced CT scan showing accentuated gastric distension with mucous enhancement, dilation of the bile duct (arrow in **A**) and thickening of the intestinal wall in segments of the small intestine (arrow in **B**), with fluid distension of the intestinal loops.