Visceral leishmaniasis causing life-threatening digestive bleeding
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Section: Abdominal imaging
Area of Interest: Lung Spleen Small bowel
Procedure: Diagnostic procedure
Imaging Technique: CT
Special Focus: Infection Haemorrhage Case Type: Clinical Cases
Authors: Tonolini Massimo, MD
Patient: 27 years, male

Clinical History:

Young immigrant from Ukraine suffering from high fever for one year, attributed to systemic lupus erythematosus and unsuccessfully treated with steroids in his native country. Physically found febrile, debilitated with generalized wasting, multiple cutaneous lesions and painful oral ulcers. Laboratory studies showed severe pancytopenia and increased C-reactive protein (200 mg/L).

Imaging Findings:

At admission, body CT (Fig. 1) revealed left lower lobe pneumonia and upper-normal-sized spleen with two unspecific focal lesions. Haemocultures and extensive serology (including HIV, Legionella, Pneumococcus, brucellosis and Widal reaction) tested negative. Visceral leishmaniasis was diagnosed on bone marrow with protozoa-laded histiocytes and confirmed by peripheral blood DNA polymerase-chain reaction.

A month following start of liposomal amphotericin-B therapy, the patient experienced haematemesis and melaena, initially treated by endoscopic clipping of gastric ulcers. After unsuccessful colonoscopy, persistent haemorrhage was identified by emergency CT (Fig. 2) as active intraluminal contrast extravasation in a jejunal loop, which was treated by transarterial embolisation. Persistent bleeding at CT (Fig. 3) required another embolisation session. Repeated CT (Fig. 4) confirmed stopped bleeding but detected a small bowel segment with thickened hypoenhancing walls suggesting post-embolisation ischaemia, confirmed at surgical exploration and resected.

Three weeks later, the patient was discharged in good clinical status with normalised blood count, C-reactive protein, and imaging appearances.

Discussion:

Leishmaniasis encompasses different disease forms resulting from vector-borne parasitic infection by protozoans classified as Leishmania species, and represents a major global health problem with an estimated prevalence of 12 million cases and over 350 million people at risk worldwide. Transmission occurs through bite of female haematophageous sandflies, including a zoonotic form (with dogs, rodents and other carnivores as reservoir) in the Mediterranean basin, Middle East, China and South America, and a human-human transmitted form in East Africa, India and Bangladesh. Also known as kala-azar, visceral leishmaniasis (VL) is the disseminated form caused by L. donovani and L. infantum that target the reticuloendothelial system macrophages, with a yearly incidence of 200-400,000 new cases mostly in children. Due to climate changes and increasing human migration, VL is gradually spreading from the impoverished endemic regions and is emerging as an opportunistic infection in HIV-positive individuals (particularly intravenous drug abusers with low CD4 T-cell counts) and is currently considered an AIDS-
defining disease [1-4].

After a variable (weeks to years) incubation, clinical manifestations depend on the immune function and mostly include irregular fever, malaise, diarrhoea, abdominal pain and distension. Unless treated, VL causes progressive hepatosplenomegaly and pancytopenia from bone marrow suppression, and is eventually fatal in over 90% of cases from complications such as opportunistic superinfections and haemorrhages. Prognostic factors include HIV, advanced age, bleeding and jaundice. Diagnosis requires serology, identification of Leishmania in marrow microscopy, or polymerase chain reaction assay on peripheral blood and bone marrow aspirate [1-6]. Alone or in combination with other drugs, liposomal amphotericin-B is the preferred treatment, highly effective but toxic [7].

In conclusion, this often neglected tropical disease should enter the differential diagnosis of febrile syndromes with hepatosplenomegaly and/or haematologic abnormalities, particularly in people from endemic regions (such as India, Sudan and Ethiopia, Middle East and Brazil) and HIV-seropositive individuals. The most frequently involved gastrointestinal region is the duodenum, often with endoscopically normal mucosa [4, 5, 8]. Imaging features of VL are scarcely reported in literature and mostly include multiple nodular lesions in the spleen and liver [9, 10]. As this case exemplifies, in patients with suspected VL-related gastrointestinal bleeding multidetector CT-angiography is the preferred investigation technique, which provides accurate information about the presence or absence of intraluminal contrast extravasation representing active haemorrhage, and promptly allows correct choice of treatment including interventional embolisation or surgery [11].

**Differential Diagnosis List:** Visceral leishmaniasis complicated by small bowel haemorrhage requiring transarterial embolisation, Myeloproliferative syndromes, Lymphoproliferative disorders / Lymphoma, Autoimmune syndromes e.g. systemic lupus erythematosus, Sepsis, Malaria, Typhoid fever, Tuberculosis

**Final Diagnosis:** Visceral leishmaniasis complicated by small bowel haemorrhage requiring transarterial embolisation

**References:**


Description: At admission, chest CT images viewed at lung (a) and soft tissue (b) window settings showed a left lower lobe pneumonic consolidation. Origin: Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
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Description: Abdominal venous-phase acquisition showed an upper-normal-sized spleen with a small hypovascular intraparenchymal lesion (arrowhead) measuring nearly 1.5 cm at the upper third. Peritoneal effusion, liver lesions and adenopathies were not seen. Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Furthermore, the upper-normal-sized spleen showed a larger (6x5 cm) inhomogeneous lesion (*) located ventrally, which did not alter the organ contour. Peritoneal effusion, liver lesions and adenopathies were not seen. Origin: Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
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Description: Unenhanced images showed appearance of bilateral pleural effusion (+), predominant on the left side. Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
**Description:** Arterial-phase contrast-enhanced acquisition showed moderate right parietocolic and pelvic peritoneal effusion (*), and a focal high-attenuation intraluminal contrast extravasation indicating active bleeding in a jejunal loop (arrows).

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Description: Detail sagittal reconstruction shows the jet-like intraluminal contrast extravasation indicating active bleeding in a left-sided jejunal loop (arrows). Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Description: The intraluminal contrast extravasation (arrows) indicating active bleeding in a jejunal loop progressed in the venous-phase acquisition. Note right-sided peritoneal effusion (*). Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Description: The intraluminal contrast extravasation (arrows) indicating active bleeding in a jejunal loop progressed in the venous-phase acquisition. Note right-sided peritoneal effusion (*). Origin: Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
Figure 3  

**Description:** At the lung bases, increasing pleural effusions (+) and lower lobe pneumonic-atelectatic consolidations were noted. **Origin:** Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
**Description:** Unenhanced acquisition showed appearance of linear hyperattenuating material (thin arrows) corresponding to embolisation of distal superior mesenteric artery branches with acrylic glue+lipiodol. Note dilated bowel with intraluminal fluid containing blood and diluted contrast medium.

**Origin:** Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Description: CT-angiography acquisition showed persistent intraluminal contrast extravasation from active bleeding (arrows) in a proximal ileal loop. Note dilated bowel with intraluminal fluid containing blood and diluted contrast medium. Origin: Tonolini M, Radiology Department, "Luigi Sacco" University Hospital – Milan (Italy)
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Description: Additionally, a small bowel loop (short arrows) showed minimally thickened, hypoenhancing walls in both arterial (d) and portal venous (e) phases suggesting post-embolisation ischaemia. Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
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Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
Description: At discharge after segmental small bowel resection CT showed cleared right lung base, persistent atelectasis and moderate pleural effusion (+) on the left side. Origin: Tonolini M, Radiology Department, “Luigi Sacco” University Hospital – Milan (Italy)
**Description:** Post-contrast acquisition showed stable post-embolisation branching densities (thin arrows), resolved bowel dilatation and peritoneal effusion, and absence of active intestinal bleeding.

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