

# Torsion And Splenic Infarction in Pediatric Patient. A Case Report

Torsión e infarto esplénico en paciente pediátrico. Presentación de caso

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## Palabras clave (DeCS)

Bazo  
Enfermedades del bazo  
Esplenomegalia  
Infarto del bazo

## Summary

Wandering spleen is a rare pathology in which the spleen is not in its usual location, secondary to abnormal laxity or absence of ligaments, predisposing to torsion and infarction, more frequent in children under 10 years of age and women in the third decade of life. Patients often consult for an asymptomatic abdominal mass or subacute gastrointestinal symptoms and even acute abdomen. Diagnosis is made through images and its management is surgical. In this case, an 11-year-old female patient is presented, diagnosed with splenic torsion and infarction by computerized axial tomography (CT) and ultrasound. Surgical management is performed without complications.

## Resumen

El bazo errante es una patología poco común, en la cual el bazo se encuentra fuera de su ubicación habitual, como consecuencia de una laxitud anormal o ausencia de ligamentos, lo cual predispone a torsión e infarto; es más frecuente en niños menores de 10 años y en mujeres en la tercera década de la vida. A menudo, los pacientes consultan por una masa abdominal asintomática, o síntomas gastrointestinales subagudos e incluso abdomen agudo. El diagnóstico se realiza mediante imágenes y su manejo es quirúrgico. El caso examinado corresponde a una paciente de sexo femenino de 11 años de edad, diagnosticada con torsión e infarto esplénico mediante ecografía y tomografía axial computarizada (TAC); se realiza manejo quirúrgico sin complicaciones.

## Introduction

Wandering spleen is an infrequent pathology associated with complications such as torsion of the vascular pedicle and infarction (1). The incidence rate in patients submitted to splenectomy is 0.2% (2, 3). Symptomatology is generally non-specific. In pediatric cases, the clinical presentation usually includes nausea, vomiting and fever or acute abdomen (1).

Diagnostic imaging plays a key role in its diagnosis, and includes: spleen in an abnormal position outside the left upper quadrant or with abnormal orientation, swirling of the vascular structures of the pedicle, thrombosis of the splenic vein, ascites, splenomegaly, low enhancement of the splenic contrast medium and splenic vessels and striation of the perisplenic fat (1, 2, 4). Management can be expectant with clinical observation or surgical (5).

## Clinical case

An 11-year-old female patient with a history of asthma, pulmonary tuberculosis and appendectomy. She was admitted to the institution for 12 hours of

abdominal pain in the epigastrium and mesogastrium, nausea, vomiting and absence of stool, physical examination revealed pain on abdominal palpation, with no signs of peritoneal irritation. An ultrasound study was requested in which the spleen was identified in an atypical left infrarenal location, with no other findings of interest. Observation and pain management were indicated, with satisfactory clinical evolution and subsequent hospital discharge.

Five days later, the patient consulted again for abdominal pain of intensity 10/10 on the analogue verbal scale, located in the left hypochondrium of 6 hours of evolution; physical examination showed pain on palpation in the left hypochondrium and epigastrium, with no signs of peritoneal irritation. The radiographic study shows left Chilaiditi's sign and distension of the transverse colon and small bowel loops. A new ultrasound of the abdomen showed splenomegaly of 13.8 cms, with the notable finding of the spleen located in a conventional location (above the kidney) and hypoechoic appearance, interassociated fluid in the iliac fossae and in the pelvic cavity, an event that led to the suspicion of splenic torsion (Figure 1).

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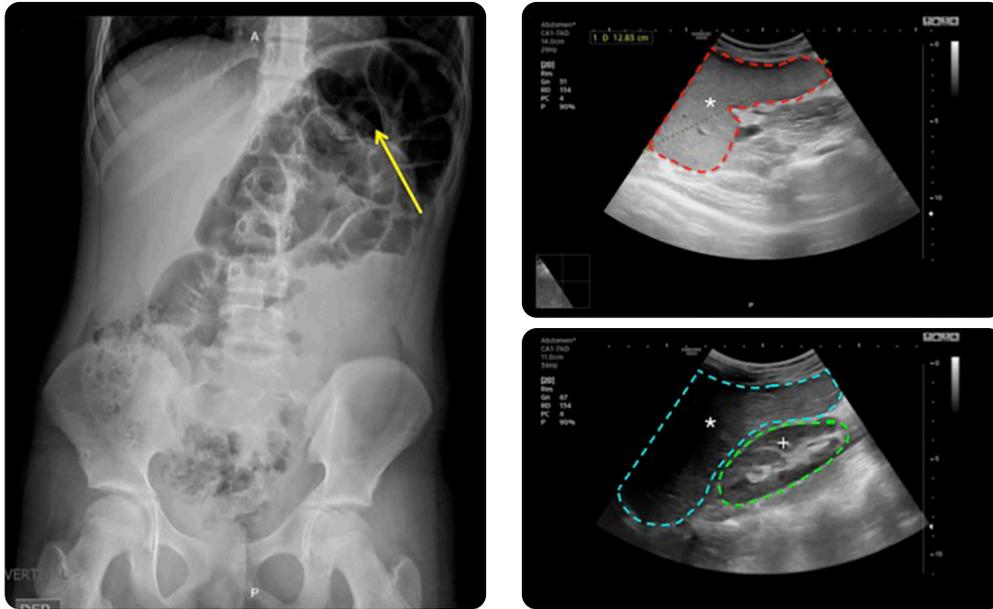


Figure 1. a) AP abdominal X-ray: left Chilaiditi sign associated with distension of colonic loops and small intestine, the splenic and renal silhouette cannot be identified. b) Initial ultrasound, splenic silhouette (\*), the kidney is not observed due to its superior location. c) Second ultrasound performed 5 days later with 6 hours of symptoms, the spleen is observed (\*), note the conventional location of the kidney (+), it is evident the lower echogenicity of the spleen in this image when compared with the previous one.

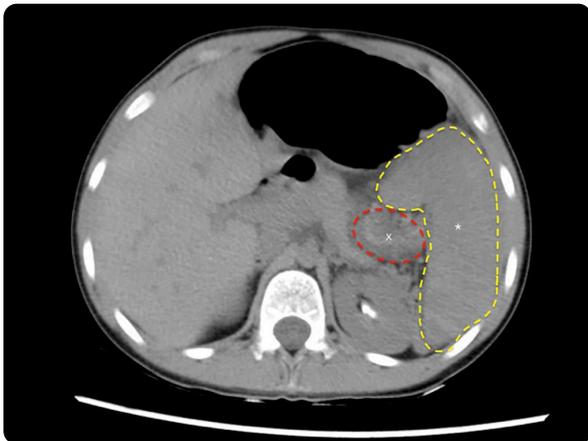


Figure 2. Simple phase CT, the spleen is observed with the usual location (\*), hypodense in relation to the liver, linear hyperdense images compatible with thrombosed vascular structures in the splenic hilum (X).

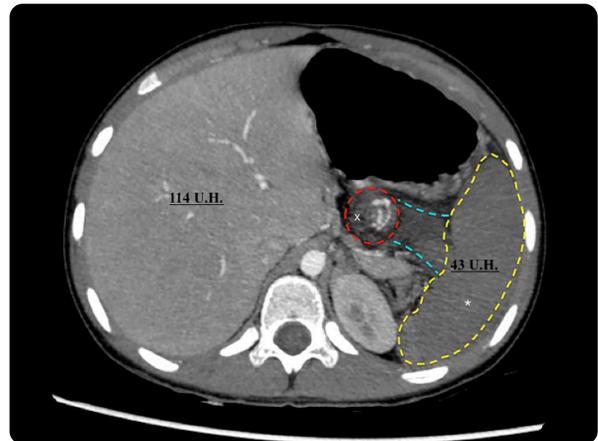


Figure 3. Arterial phase CT. The vascular swirl sign is observed (X), the vascular pedicle and splenic hilum without enhancement of the contrast medium as well as the spleen, the density of the liver of 114 HU is mentioned, in comparison with the spleen of 43 HU (\*), with a density ratio liver-spleen greater than 2.



Figure 4. CT portal phase. The vascular swirl sign (X) is observed, the vascular pedicle and the splenic hilum persist without contrast enhancement, as well as the spleen (\*), the liver density of 110 HU is mentioned, compared to that of the spleen of 43 HU, with a liver-spleen density ratio higher than 2.

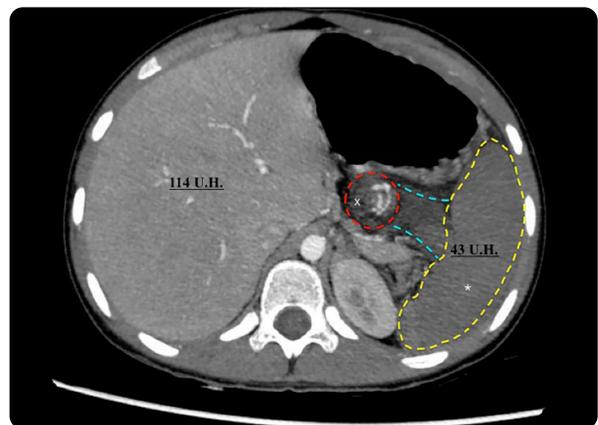


Figure 5. CT portal phase. The distal end of the tail of the pancreas is seen included in the torsion focus (X), the spleen remains hypodense in relation to the liver. Video of tomography in the following link: <https://www.youtube.com/watch?v=4PXeyvWbNvg>

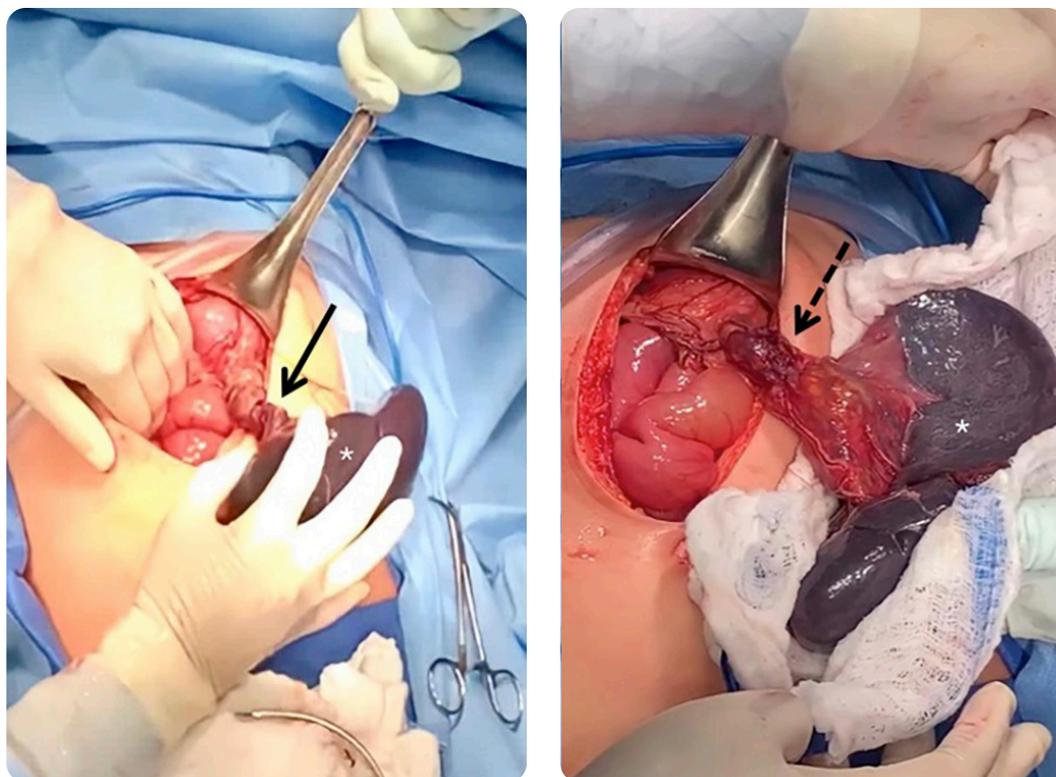


Figure 6. Photographs of surgical procedure. a) Splenomegaly with signs suggestive of ischemia with torsioned pedicle (arrow) and absence of spleen fixation ligaments. b) After detorsion of the pedicle marked with arrow, signs of ischemia persist.

Subsequently, abdominal CT was performed, the spleen was found increased in size, vascular swirl sign in the splenic hilum with torsion involving the tail of the pancreas, hypodense spleen with a density of 43 HU in the different phases (simple, arterial, venous and late); enhancement was not identified, it was observed hypodense with respect to the liver in the different acquisitions. During the simple phase, the density of the spleen was 23 HU - lower than that of the liver - with increased density of some vascular structures in the splenic hilum, suggesting thrombosis. In the venous phase, the liver reached a density of 110 HU for a liver/spleen density ratio of 2.5. Splenic torsion with signs of ischemia was diagnosed (Figures 2, 3, 4, 5) (link to full images <https://www.youtube.com/watch?v=4PXeyvWbNvg>).

Emergency laparotomy was performed, with the finding of a floating spleen with splenic torsion of 720° and splenic infarction that did not recover after detorsion, absent fixation ligaments, thrombosis of splenic vessels, pancreatic tail also included in the torsion without ischemia (figure 6). He underwent splenectomy without complications, antibiotic prophylaxis for risk of fulminant sepsis due to encapsulated germs and updating of vaccination schedule. Seven days later she was discharged with satisfactory evolution.

## Discussion

The incidence of wandering spleen is 0.2 %, and it is more common in children under 10 years of age and in women in the reproductive stage; its etiopathogenesis is still unclear and its origin is congenital or acquired. Among the risk factors associated with splenic torsion are: pregnancy, splenomegaly, multiparity, splenic cysts, Hodgkin's disease,

malaria, lymphangioma, renal agenesis, mononucleosis, Gaucher's disease and DiGeorge syndrome (1-3, 6). Few cases have been described in pediatrics (1, 7, 8). Differential diagnoses should include: lymphoma, splenic sequestration crisis, arterial embolism and venous thrombosis (6). Patients with this condition may be asymptomatic, present with nonspecific gastrointestinal symptoms or with acute abdomen, as in the case described here. As in other structures, there may be torsion and detorsion, a circumstance that triggers chronic abdominal pain. In a systematic review, in adult patients with wandering spleen treated with a surgical approach, the most common manifestations were abdominal pain and abdominal mass, and approximately half of the patients had an acute clinical onset (5). Ultrasonography, Doppler analysis and CT have a fundamental role in the diagnosis. In this case, the initial ultrasound showed a spleen of left infrarenal location with a normal ultrasound appearance and in the subsequent ultrasound study (performed on the fifth day) a spleen of conventional location was observed, which indicated displacement of this structure and suggested its torsion, which was confirmed with CT, highlighting the importance of reviewing previous imaging studies. Another ultrasound sign that suggested ischemia was the hypoechoic aspect, so the comparison of the echogenicity of the different structures continues to have a relevant role for the diagnosis, in addition to the importance for the specialist in diagnostic images to become familiar with the aspect and degree of echogenicity that the different structures have; however, there are studies that suggest a hyperechoic aspect (1). CT with contrast medium is the best tool to reach the diagnosis, as in the present case, in which it was suspected by ultrasound and finally confirmed by CT, managing

to identify some typical signs, such as the vascular swirl of the splenic hilum, non-enhancement of the contrast medium in the different phases, which suggested ischemia, and also a density lower than 45 HU; in addition, a ratio of liver/spleen densities higher than 2; signs described as suspicious of ischemia (4). Among the complications associated with torsion, besides infarction, functional asplenia, pancreatitis, intestinal obstruction or gastric volvulus, splenic rupture and hemoperitoneum must be considered (1, 6). Regarding management, in some cases recommendations and observation, traditional surgical treatment with splenectomy and new techniques aimed at de-rotation and fixation of the spleen in an anatomical position by means of sutures, peritoneal pockets or meshes are performed. In this patient, after de-rotation, signs of ischemia persisted, so splenectomy was performed (4, 8). Likewise, it is important to apply antibiotic prophylaxis and vaccination due to the increased risk of infections by encapsulated germs.

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