

Case report

## Acute torsion of a wandering spleen in a child: preoperative diagnosis by ultrasonography and computed tomography

Hassen Saadaoui <sup>a,\*</sup>, Véronique M. Toppet <sup>a</sup>, Guido Hubloux <sup>a</sup>, Martin Horth <sup>b</sup>,  
Guy B. Cadière <sup>c</sup>, Marianne R. Spehl <sup>a</sup>

<sup>a</sup> Department of Radiology, Hôpital Universitaire Saint-Pierre, rue Haute 322, 1000 Bruxelles, Belgium

<sup>b</sup> Department of Pediatrics, Hôpital Universitaire Saint-Pierre, rue Haute 322, 1000 Bruxelles, Belgium

<sup>c</sup> Department of Gastrointestinal Surgery, Hôpital Universitaire Saint-Pierre, rue Haute 322, 1000 Bruxelles, Belgium

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### 1. Introduction

Wandering spleen is a term applied to migration of the spleen from its normal location. The wandering spleen is usually enlarged and has a long vascular pedicle [1], then, it is at risk of torsion around this pedicle.

We describe a case of wandering spleen in a child presenting with acute abdominal pain and midabdominal mass. The preoperative diagnosis of acute torsion with infarction was made by the combination of ultrasonography (US) and computed tomography (CT).

### 2. Case report

A 6 year old girl presented with acute abdominal pain of 10 h duration. There was no history of nausea or vomiting and her temperature was 36.9°C.

She had been complaining of a vague abdominal pain for 4 days.

The physical examination revealed a medial soft hypogastric mass, which was slightly painful. The possibility of this mass being the spleen was not considered.

The laboratory results were as follows: sedimentation rate 35 mm after 1 h, white blood cells 10 700/mm<sup>3</sup>, red

blood cells 4.6 × 10<sup>5</sup>/mm<sup>3</sup>, hemoglobin 12.1 g/100 ml, platelets 216 × 10<sup>3</sup>/mm<sup>3</sup> and no Howell Jolly body were found. Blood cultures were negative.

Hemoglobin electrophoresis was regular. Urinary catecholamines were not elevated. Bone marrow was normal.

Serology for CMV, EBV, toxoplasmosis and leishmaniasis were negative as well as Gruber–Widal and Wright tests.

A plain abdominal radiograph revealed the absence of splenic shadow in the left upper quadrant with bowel loops in close contact to the diaphragm and a hypogastric mass of soft tissue density (Fig. 1). Ultrasonography confirmed the absence of spleen in its usual location and displayed an anterior hypogastric echogenic mass with vascular anatomy that looked like a spleen. The tail of the pancreas could not be demonstrated. The diagnosis of wandering spleen was proposed (Fig. 2).

Contrast media enhanced CT-scan was then performed confirming the absence of the spleen in the left upper quadrant. Moreover, an inverted stomach in the splenic fossa, bowel sub-occlusion, pancreatic tail in a position lower than normal and a spleen in the anterior hypogastric position could be detected.

The wandering spleen appeared enlarged with a focal hypodense lesion of infarction in its left upper part and its pedicle was twisted (Fig. 3).

\* Corresponding author. Tel.: + 32 2 5354634.

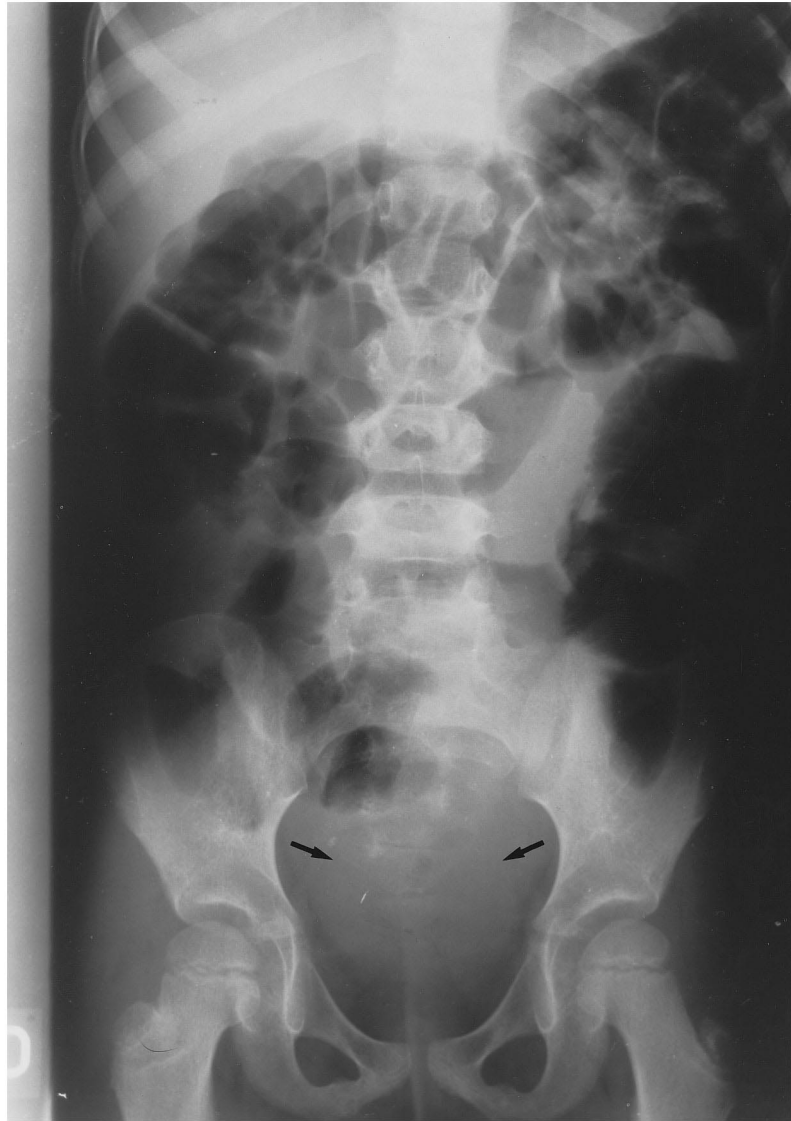


Fig. 1. Supine abdominal film. Absence of splenic shadow in the left upper quadrant and hypogastric mass of soft tissue density without calcifications (arrow).

Torsion of the vascular pedicle of the spleen was evident on four successive scans (total height of 4 cm) (Fig. 4).

The tail of the pancreas was not involved in the torsion.

Thus, CT confirmed the ultrasonographic findings, in addition, it could demonstrated the infarction.

Urgent laparoscopic surgery was performed and validated the presence of an enlarged congested spleen with infarction of the left upper pole. A 360° torsion of the vascular pedicle was found. Splenic ligaments were absent.

### 3. Discussion

The spleen is maintained in its normal position by

three ligaments: the splenorenal ligament, the gastrosplenic ligament, and the phrenicocolic ligament [2–4]. The hilum of the spleen is the site of reflection of its supporting mesenteries. When the ligaments are too long or absent, it leads to what is called a ‘wandering spleen’, a rare condition which is seldom diagnosed before surgery. Preoperative diagnosis of acute torsion, especially in children, is even more exceptional.

In 1989, Allen in a review of the English literature, found 35 cases of wandering spleen in children younger than 10 years of age, 18 were twisted and in eight cases the diagnosis of torsion was made preoperatively [5]. Eraklis found four cases of wandering spleen among 1413 splenectomy cases [6].



Fig. 2. Axial (1) and sagittal (2) US scans. Echogenic supravvesical mass (s) that looks like the spleen surrounded by a small amount of free abdominal fluid (arrow). Bladder (B)

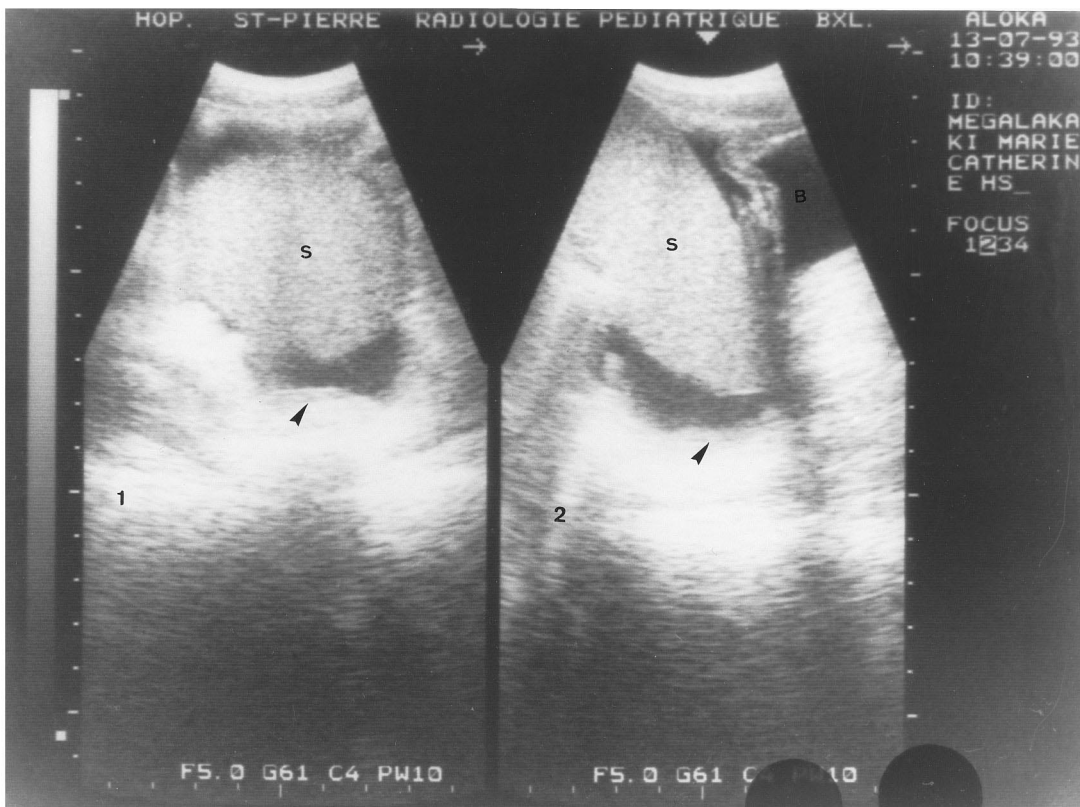


Fig. 3. Enhanced CT-scan of the upper part of the wandering spleen (s) with focal hypodense lesion of infarction (IN).

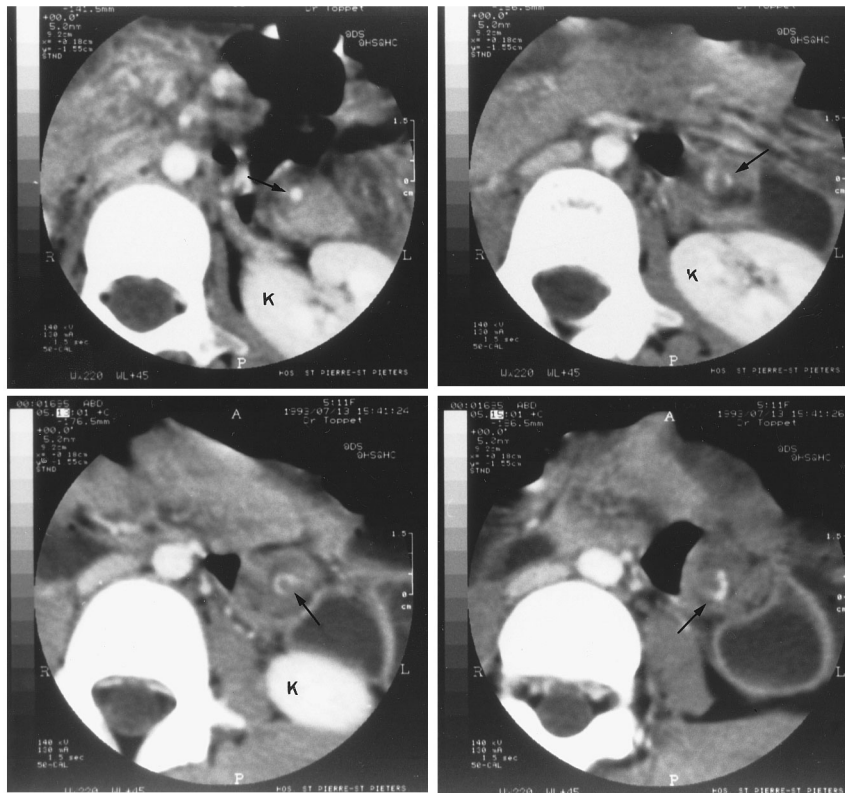


Fig. 4. CT study. Serial cuts through the twisted vascular pedicle (arrow) of the spleen from kidney (K) down to the splenic hilum in the pelvis (total length of 4 cm): characteristic whorled appearance.

The etiology of wandering spleen remains unclear but abnormal congenital fetal development is contemplated. The spleen develops within the dorsal mesogastrium dividing into two parts, the gastrosplenic ligament and the splenorenal ligament which fuse with the posterior peritoneum to form the definitive short spleno-renal ligament [1]. If failure of this fusion occurs, it leads to a long splenic mesentery causing a wandering spleen that is predisposed to torsion and subsequent infarction [7].

Acquired factors are: splenomegaly (malaria, Hodgkin's disease), abdominal laxity, hormonal effects of pregnancy and surgical alteration of the gastrosplenic ligament [8,9].

Patients with a wandering spleen may be asymptomatic or present minor episodes of abdominal pain due to intermittent torsion and spontaneous detorsion of the vascular pedicle. Other clinical manifestations include: vomiting, nausea, fever.

When acute torsion occurs the main clinical manifestation is acute abdominal pain due to torsion of the splenic pedicle with subsequent infarction [9].

Most of the time the wandering spleen is discovered during emergency surgery for acute abdomen of undetermined cause. Confusion with appendicitis, ovarian torsion is frequent.

Plain radiography of the abdomen is usually non specific and can suggest the diagnosis of wandering spleen by showing absence of the normal spleen shadow [1,3,10,11] and central abdominal or pelvic mass.

In wandering spleen, sonography shows absence of the spleen in its normal location and an echogenic 'mass' with splenic echostructure and vascular anatomy representing hilar vasculature elsewhere in the abdomen [1,9,12–14] but like in our case sonography is often hampered by bowel gas, in this case infarction can be mistaken [15,16].

CT, in particular with contrast enhancement shows very clearly the absence of the spleen anterior to the kidney and posterior to the stomach [11]. The presence of a lower abdominal or pelvic mass with homogeneous or heterogeneous parenchyma, depending on the absence or presence of infarction, is easily demonstrated. Secondary findings include ascites and necrosis of the pancreatic tail which is extremely important to be aware of for preoperative planning [17,18].

In wandering spleen is suspected on US, Dynamic CT scan is the best tool to make the diagnosis of wandering spleen with pedicle torsion, because it gives an evaluation of the vascularity of the spleen and

allows preoperative planning [1,14,18]. CT whirled appearance of the splenic pedicle is the major sign of pedicle torsion.

Other advantages of CT are the demonstration of pancreatic tail involvement and in chronic torsion, a thick pseudo capsule [19].

Whenever an acute wandering spleen is suspected on US, CT should be performed in order to look for infarction and whorled appearance of the splenic pedicle and then decide regarding the indication of surgery.

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