Wandering Spleen: Whirlpool Appearance in Color Doppler Ultrasonography. A Case Report

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ABSTRACT

Wandering spleen is an unusual surgical condition that is generally asymptomatic, but the long and mobile vascular pedicle of the spleen predisposes it to torsion. Various imaging modalities can be used to diagnose a wandering spleen. We present the case of a 23 year-old female patient with abdominal pain, in whom torsion of the spleen was diagnosed preoperatively, using color Doppler sonography, as a whirlpool appearance.

INTRODUCTION

Wandering spleen is an unusual surgical condition encountered due to the extreme weakening or loss of the gastrosplenic and splenorenal ligaments that fix the spleen within the left upper quadrant of the abdomen (1-5). While this condition is generally asymptomatic, its long and mobile vascular pedicle predisposes the spleen to torsion. Without clinical indications, diagnosis is very difficult.

Wandering spleen is more frequent in women of childbearing age (1,3,5). Various imaging modalities are used for the diagnosis of wandering spleen, but urgent color Doppler ultrasonography could be a very useful tool in the initial diagnosis, which reveals the ectopic spleen and whirlpool feature of the tortuous vascular pedicle.

CASE REPORT

A 23 year-old Iranian Azari female was referred to the Emergency Department due to abdominal pain. She had progressive pain for 24 hours previous to admission, with nausea and vomiting, but normal bowel function. The night before admission, the pain increased in intensity and was described as a generalized pain that was more severe in the right lower quadrant of the abdomen. She also gave a history of intermittent, self-relieving, similar pain from one year ago, for which she was treated as an outpatient. The vital signs at the time of presentation were: Blood Pressure, 120/80 mmHg; Pulse Rate, 80 beats/minute; Respiratory Rate, 18; and Temperature, 37.2 °C.

There were no pathological findings in the head, neck and chest examinations. In the abdominal physical examination, a mobile tender mass was detected at the right side of the um-
bilerus. Her laboratory investigations were normal. Grey Scale Ultrasonography of the abdomen with a curve linear transducer (3-5MHz) showed that the spleen was not in its usual site, and was located in the right parambilical region with a 3x5 cm triangular hypoechoic region in its upper pole (Figure 1).

Color Doppler ultrasonography of the ectopic spleen did not show blood flow in the dilated splenic vein, but the splenic artery had blood flow (Figure 2). A color Doppler evaluation of the blood supply to the spleen revealed a twisted ectopic splenic artery with a whirlpool appearance (Figure 3).

The patient underwent a laparotomy, with suspected diagnosis of torsion of a wandering spleen after an injection of pneumovax according to the guideline of our deputy ministry for education.

The operative findings included a large spleen with a long and twisted pedicle, and a large area of infarction in the spleen. A splenectomy was carried out due to the intractable abdominal pain and color Doppler ultrasonographic findings.

The pathological report revealed a 20x12x6 cm mass with a large area of infarction. The postoperative period was uneventful and the patient was discharged on the 5th postoperative day. The patient was followed up for six months and was in good general condition. She had no abdominal pain after the splenectomy.

**DISCUSSION**

Wandering spleen is an extremely rare condition that is characterized by excessive mobility and displacement of the spleen from its normal position, due to the congenital or acquired absence of splenic ligaments (1-5).

Hippocrates, Pliny, Heophilus and Galen recognized that the spleen could be located in an unusual place, but a clinical description of wandering spleen (WS) was first noted at autopsy in 1967 by Van Horne (5).

As an intra peritoneal organ, the spleen develops as mesenchymal cell clusters within the dorsal mesogastrium at approximately 28 days. The most important structures derived from the dorsal mesogastrium are the gastrolienal and lienorenal ligaments. It has been hypothesized that the spleen develops during foregut rotation, when this period influences splenic positioning, and a congenital wandering spleen develops as a result of the laxity or mal development of its suspensory ligaments. There is an improper formation of a long splenic pedicle with an increased probability for abnormal fixation and torsion (6). In the acquired condition, abdominal laxity, multiple pregnancies, hormonal changes with pregnancy or splenomegaly have been advocated (3-5,7).

Wandering spleen is more commonly seen in women 20 to 40 years old (1,3,5), and the age at presentation may vary from 3 months to 80 years. Females constitute 80% of the cases, and one-third is children (1,2,5). The clinical presentation is variable, and the patient may be asymptomatic or may have intermittent pain resulting from torsion and distortion, or may present with a mobile palpable mass (1,4,5). Excess mobility of the spleen can predispose
complications, including acute torsion of the vascular pedicle, gangrene or splenic abscess formation, hemorrhage from gastro-esophageal varices, acute pancreatitis or necrosis of the pancreatic tail secondary to torsion, partial or complete gastric volvulus and intestinal obstruction. In these conditions, the patient presents with an acute abdomen, which may be confused with appendicitis, ovarian torsion, diverticulitis, cholecystitis, pancreatitis and non-specific peritonitis (1-2).

Laboratory tests are usually non-specific, but may rarely reveal evidence of hypersplenism or functional asplenia by evaluating peripheral smears for Howell-Jolly bodies or other particles, in particular, when associated with torsion of an elongated splenic pedicle (8). Since a clinical diagnosis can be difficult, non-invasive imaging procedures, such as sonography, nuclear scintigraphy, computed tomography (CT) and MRI, are the common diagnostic modalities (1-5). Plain radiographs and barium examinations are usually non-specific (1).

Ultrasoundography and CT scans show the absence of the spleen in its normal position and a comma-shaped, mobile mass in the abdomen or pelvic area. A CT scan is the diagnostic modality of choice for the diagnosis of a wandering spleen, especially when there is suspicion of torsion and when the spleen cannot be observed upon ultrasonography because of bowel gas. Post-contrast CT scans reveal non-enhancing low-attenuation areas in the regions of splenic infarction, thereby providing crucial information concerning the viability of the spleen. The “whir sign” of the splenic pedicle is diagnostic of splenic torsion. Another specific sign of splenic infarction on CT is the “rim sign” in which the splenic capsule is hyperdense compared with the parenchyma. An angiographic finding characteristic of the disease is a tapered and abruptly twisted distal splenic artery (1-3).

Treatment of WS is operative because conservative treatment is associated with increased complications (1-3). A splenectomy is advocated if there is functional asplenia due to torsion, splenic infarction, splenic vessel thrombosis, secondary hypersplenism or any suspicion of malignancy (1,3,4). Splenopexy is preferred when a viable WS is found upon laparotomy and there is no evidence of infarction, thrombosis or hypersplenism (1,3,5,6).

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