Wandering Spleen in a Child with Atypical Abdominal Pain

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ABSTRACT

Wandering spleen is an uncommon clinical condition especially in children. We present a case of wandering spleen in a 7-year-old girl who presented with intermittent dull abdominal pain for 10 days. The abdominal sonography and MRI revealed an enlarged spleen in the lower abdomen. Surgical management was to restore circulation of spleen and splenopexy.

Keywords: Wandering spleen, child, ultrasonography, MRI, splenopexy

INTRODUCTION

Wandering spleen is a rare diagnosis with a reported incidence rate of less than 0.5% in all splenectomies [1]. Five hundred cases have been reported in the medical literature as of 2008 [2], which commonly seen in women in reproductive age (aged 20-40), especially in multiparous women [3]. Lombardi et al. [4] reviewed 40 articles published from 2002 to 2012 and summarized imaging finding including 55 pediatric patients younger than 18 years old. It is characterized by splenic hypermobility due to embryological absence, maldevelopment or acquired laxity of the splenic suspensory ligaments which presents an elongated pedicle and is displaced from its usual position in the upper left quadrant of abdomen. Wandering spleen is considered with a high incidence of torsion or infarction [5], however is a rare cause of abdominal pain in pediatric cases and is less frequent than adult cases. The recommended surgical treatment includes fixation of the spleen (splenopexy) except in cases of infarction where there is occlusion of the splenic vascular supply and subsequent tissue necrosis developed, in such a condition splenectomy should be inevitably considered [6].

With the aid of imaging modalities (MRI, ultrasonography, CT scan), the patient was found to be having an enlarged spleen in the pelvic region. Imaging can play an important role in timely evaluation and appropriate treatment can be initiated. Here, we report a pediatric case of wandering spleen as an incidental finding.

CASE REPORT

A 7-year-old girl presented with intermittent dull abdominal pain ten days prior to admission. The pain was localized in her left upper quadrant without radiation to back. She also complained of anorexia but fair activity level. With the progression of pain and development of fever (37.9°C) in the following days, she presented to Emergency Department. Physical examination revealed no obvious abdominal mass on palpation. There's no peritoneal sign. Laboratory findings were within normal limits, except for her WBCs count which was 18.1 \times 10^9/L and band form was 3%; and the lipase level was normal. The fecal occult blood test was negative. Plain abdomen X-ray (Fig. 1) was not unusual. Abdominal ultrasonography were performed in supine position, showed free fluid in pelvis and enlarged size of the spleen without any mention of splenic position. The tentative diagnosis was gastritis, under the conservative treatment with fluid supplement and oral medications, she was discharged one day after admission, no emergent surgery was performed. Two weeks later, control
ultrasonography demonstrated a homogeneous echogenic well-demarcated mass about 11.7 cm in long-axis, in the lower abdominal cavity (Fig. 2). The absence of spleen in the original position of left upper abdomen suggested the mass could be an enlarged displaced spleen. MRI study was performed and revealed the absence of spleen in its normal position. The spleen is enlarged measuring 13.1 cm, found in the lower mid abdomen, extending from the level of the inferior pole of left kidney to the urinary bladder dome (Figs. 3-4). Neither vascular torsion nor splenic infarction is seen. A final diagnosis of a wandering spleen with enlargement was made, and the patient was referred to a pediatric surgeon for further management, though there’s no image evidence of vascular compromise. Operation was performed successfully. Restore circulation after manual detorsion, splenopexy was performed. Post-operation course was smooth and she was discharged 6 days later. The operative findings included moderate splenomegaly with elongation

**Figure 1.** Abdominal x-ray showed gas-filled bowel loop in splenic fossa but not definite diagnosis of wandering spleen.

**Figure 2.** Longitudinal abdominal ultrasonography shows enlarged spleen about 11.7 cm in long-axis, in the lower abdominal cavity.

**Figure 3.** Coronal fat saturation T1-weighted MR image (TR/TE, 4/2) with gadolinium enhancement shows lack of splenic tissues in the left upper quadrant.

**Figure 4.** Axial fat saturation T1-weighted MR image (TR/TE, 4/2) with gadolinium enhancement shows enlarged pelvic spleen with homogeneous enhancement.
and laxity of the pedicle, and ischemic change of spleen on exploration due to twisting of splenic pedicle. The patient was followed up for three months and was in good general condition.

DISCUSSION

Wandering spleen, also known as pelvic spleen, ectopic spleen, splenoptosis, floating spleen, is a rare clinical entity that could be due to congenital or acquired causes. In embryologic development, the spleen develops from a mass of mesenchymal cells in the dorsal mesogastrium [7], incomplete fusion of dorsal mesogastrium to the posterior abdominal wall during the second month of gestation results in abnormally long pedicles of spleen and subsequent migration of spleen from its original anatomical position of left upper quadrant of abdomen connecting with the stomach and left kidney. There are four main suspensory ligaments of spleen include gastrosplenic, splenorenal, splenophrenic, splenocolic ligaments, which help to hold the spleen stationary. The former two especially play an important role in fixing and envelop the splenic vessels to provide adequate organ perfusion. The latter two are usually relatively avascular [8]. In acquired condition, such as in pregnancy or muscular dystrophies, this pathologic process may be acquired in splenomegaly or ligamentous laxity. It is documented that higher incidence rate in young multiparous women [9], suggests the etiological role of pregnancy-induced hormonal effect and abdominal laxity.

In 1667, this rare condition of wandering spleen was firstly described by Johannes van Horne, a Dutch physician, as an incidental finding during an autopsy. The real incidence of wandering spleen is unknown, because the individuals who never developed symptoms are unknown, Padilla et al. found up to 50% remain asymptomatic [10], abdominal pain will be experienced by the remainder. In a review of several large series of splenectomies for disease, the incidence was 0.2% [11]. The clinical presentation of a wandering spleen is variable. It may be manifesting clinically as an abdominal mass or abdominal pain. The pain can be chronic, intermittent or acute. The size of wandering spleen may be normal or enlarged [12]. In children, the most common clinical presentation is acute abdominal pain, also nonspecific symptoms such as vomiting, nausea, or mild, crampy abdominal pain [13]. Complications such as splenic torsion with resultant splenic infarction, gastric volvulus, bowel obstruction or acute pancreatitis can develop. However, with the large advance in noninvasive imaging techniques, the preoperative diagnosis has become more common in recent decades.

On abdominal plain films, absence of the splenic silhouette in the left upper abdomen with central or left intraabdominal comma-shaped soft tissue density, an elevated left kidney or gastrointestinal obstruction may be seen. Technetium-99m sulfur colloid (Tc-99m SC) scintigraphy is the most commonly used for imaging of the ectopic functional spleen. Upper, lower GI, and small bowel series with contrast medium may demonstrate displacement of the splenic flexure or GI tract obstruction [14]. On ultrasonography, CT or magnetic resonance imaging (MRI), absence of the spleen in it’s typical location with an ectopic localization leads to the definitive diagnosis of wandering spleen [15], as in our case. In cases of acute torsion or infarction, accurate and prompt diagnosis is crucial. Color flow and duplex Doppler ultrasonography, a safe (free of ionizing radiation), rapid, efficient, relatively low-cost imaging modality, revealed decreased or non-detectable blood flow and high resistive index in splenic artery. Partial or complete non-enhancement of splenic parenchyma after administration of intravenous contrast material in CT and MRI, perifocal fat-stranding, and edema may be seen as increased signal in T2-weighted image, allow diagnosis of acute torsion, ischemia, or infarction.

Treatment options include observation, splenectomy or splenopexy. In asymptomatic cases of wandering spleen, follow-up is recommended [16]. To prevent future traumatic injury to the unprotected abnormally located spleen, laparoscopic splenopexy can be performed for the fixation; in cases of acute torsion, with infarction and necrosis, treatment by splenectomy may be inevitable [17]. Our patient is being presented here because of nonspecific abdominal pain and wandering spleen was an incidental finding, as considering enlarged size of spleen, to prevent future complication or overwhelming post-splenectomy sepsis, splenopexy was done successfully.

REFERENCES