



A RARE ASSOCIATION OF WANDERING SPLEEN WITH SPLENIC ARTERY PSEUDO-ANEURYSM

Radiodiagnosis

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ABSTRACT

INTRODUCTION

Wandering spleen is a rare entity in which the spleen lies in ectopic location in abdomen or pelvis and has a long excessively mobile pedicle by which it moves or "wanders" due to ligamentous laxity. It has a bimodal incidence, in children below 1 year of age and in women of childbearing age due to splenomegaly or pregnancy [1]. We present here an unusual case of a 26 yr old female who presented with a painless, mobile lump noticed by her in pelvic region on left side and a radiological diagnosis of wandering spleen with a pseudo-aneurysm of splenic artery was made and confirmed operatively. To our knowledge, this is the first case to describe this rare association of wandering spleen with splenic artery pseudo-aneurysm.

KEYWORDS

Wandering spleen, splenic artery pseudo-aneurysm, splenectomy, splenopexy.

CASE REPORT

A 26 year old female presented to the gynecology department with complaint of a painless, mobile abdominal lump in hypogastric region noticed since three to four weeks. She had no menstrual irregularities. She was a multiparous woman. She complained of short-lasting occasional episodes of dull intermittent pain in relation to the swelling which subsided spontaneously. There was no history of antecedent trauma. Her bowel and bladder habits were regular and unaltered. Her vitals were stable. Per abdominal examination revealed a firm, non-tender lump in left iliac fossa which moved in all quadrants. It had smooth inferior borders. To elicit the nature of lump, the patient was referred to the radiology department.

Transabdominal sonography with 4MHz curvilinear transducer (Philips HD7XE) showed absence of the spleen in its normal location in the left upper quadrant. An enlarged spleen (measuring about 15.5 cm craniocaudally) was seen located ectopically in the left iliac fossa superolateral to the uterus (Figure 1). It had homogenous echotexture and showed normal vascularity on color Doppler. A small rounded pulsatile thin walled echo-poor sac measuring 2.6 X 1.7 cm in size was seen at splenic hilum which on color Doppler showed ying-yang pattern of flow suggesting a pseudoaneurysm of splenic artery (Figure 2a and 2b).

CECT abdomen (128 slice Optima scanner, GE, USA) showed the enlarged spleen located in left iliac fossa superior to urinary bladder with elongated pedicle (Figure 3). It showed homogenous enhancement without areas of infarction. A rounded patent pseudo-aneurysm arising from distal splenic artery at splenic hilum was seen which showed enhancement akin to aorta on arterial and venous phase (Figure 4a and 4b). No other associated complications were seen.

Since the patient was an adult, the risk of post-splenectomy sepsis was low. Also she had an enlarged spleen with a pseudo-aneurysm of splenic artery which puts the patient at risk of rupture of pseudo-aneurysm in future and catastrophic intra-abdominal bleed. So in view of all this, patient underwent splenectomy. The findings of wandering spleen with distal splenic artery pseudoaneurysm were confirmed operatively. The post-operative course was uneventful.

FIGURES

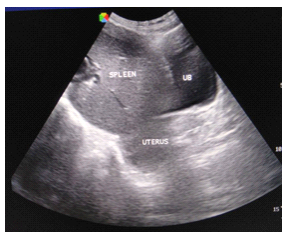


Figure 1 Transabdominal ultrasound showing enlarged spleen located in left iliac fossa superior to urinary bladder (UB) with its hilum facing medially and superiorly. The echotexture of spleen was homogenous without areas of infarction.



Figure 2a Transabdominal ultrasound of left iliac fossa showing an echopoor sac at splenic hilum (seen in fig 2a) showing ying-yang pattern of flow on color Doppler (fig 2b) suggestive of pseudoaneurysm of splenic artery.

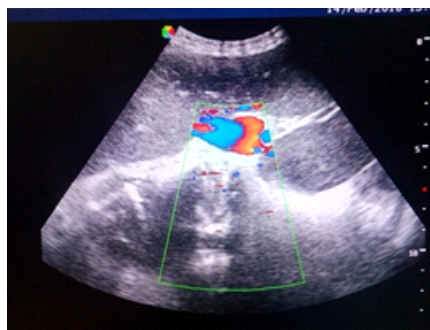


Figure 2b Transabdominal ultrasound of left iliac fossa showing an echopoor sac at splenic hilum (seen in fig 2a) showing ying-yang pattern of flow on color Doppler (fig 2b) suggestive of pseudoaneurysm of splenic artery.



Figure 3 CECT abdomen axial reformatting image of pelvis (portal venous phase) shows homogeneously enhancing enlarged spleen in left iliac fossa.

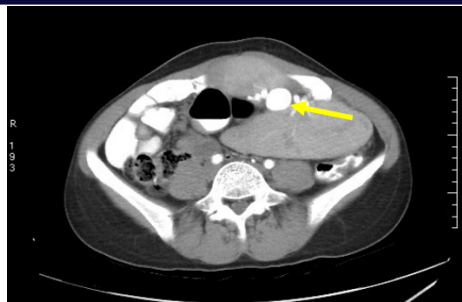


Figure 4a CECT abdomen with oral contrast: Axial reformatted image of pelvis (arterial phase) demonstrates the contrast filled sacular outpouching at splenic hilum suggestive of pseudo-aneurysm of splenic artery (thick yellow arrow).



Figure 4b CECT abdomen with oral contrast: Coronal reformatted image (arterial phase) demonstrates the contrast filled sacular outpouching at splenic hilum suggestive of pseudo-aneurysm of splenic artery (thick yellow arrow).

DISCUSSION ANATOMY

The spleen is usually a completely peritonealized organ and it is held in its natural position in left hypochondrium by suspensory ligaments namely splenorenal, gastrosplenic and phrenicocolic ligaments [2]. The splenorenal ligament, which connects the splenic hilum to the left kidney, contains the tail of the pancreas and the splenic artery and vein. The gastrosplenic ligament is formed by the union of the peritoneum of the lesser and greater sacs and connects the splenic hilum to the posterior aspect of stomach. This ligament carries the short gastric and left gastroepiploic arteries. The phrenicocolic ligament has two parts: splenocolic and splenophrenic which connect the lower pole of the spleen to the splenic flexure of the colon and the diaphragm respectively.

ETIOPATHOGENESIS

There are two main etiologies behind wandering spleen. One is congenital theory. The spleen arises from a mass of mesenchymal cells located between the layers of the dorsal mesentery. In the congenital form of wandering spleen, there is failure of normal development of the dorsal mesogastrium and the suspensory ligaments when the lesser sac is formed. Faulty development of suspensory ligaments and failure of fusion of dorsal mesogastrium to the posterior abdominal wall causes hypermobility of spleen and an exceedingly long pedicle. In the acquired form, there is laxity of suspensory ligaments causing hypermobility. It occurs in multiparous women in their reproductive age group (between 20 to 40 years of age) as a result of hormonal changes during pregnancy which causes loss of normal tone of abdominal wall and the suspensory ligaments of spleen [2].

CLINICAL PRESENTATION OF WANDERING SPLEEN

Wandering spleen usually presents as asymptomatic abdominal mass as in this case. Acute torsion and infarction may present as fever, vomiting and acute abdominal pain. Chronic torsion and detorsion may present as intermittent colicky pain. A constant vague abdominal

discomfort can result due to splenic congestion [2, 3]. Torsion can be precipitated by any movement of the body, changes in intra-abdominal pressure during respiration or peristalsis or distention of adjacent organs [2]. Acute pancreatitis or pancreatic volvulus may be associated due to entanglement of the tail of the pancreas in the splenic vascular pedicle [4]. Gastric compression, distention or volvulus may also occur as the ligaments holding stomach in its usual place are also faulty or lax [5].

On physical examination, a triad of a firm ovoid mass with a notched edge, painful movement of the mass except when the mass is moved toward the left upper quadrant and resonance to percussion in the left upper quadrant has been described to suggest the diagnosis of a wandering spleen [2]. The lump may be tender in case of torsion and infarction.

RADIOLOGICAL FINDINGS OF WANDERING SPLEEN

Radiographs taken in the setting of acute abdomen may show a soft tissue mass in left lumbar or pelvic region and if enlarged, the surrounding bowel loops are displaced.

The most reliable, easily available and least invasive method of making the diagnosis is ultrasonography. Sonography can demonstrate absence of spleen from its normal position in the left upper abdomen. Spleen has characteristically two ends, three borders, two surfaces, two angles and a hilum. On ultrasound it is identified by its typical homogenous echogenicity which is equal or slightly higher than liver (in viable spleen). Spleen can be normal sized or enlarged. Acute infarcts are seen as wedge shaped, round or irregularly delineated hypoechoic or anechoic areas. Healed infarcts appear as hyperechoic areas [6]. On color Doppler, torsion is seen as a twisted splenic pedicle (whirl sign) or absence of flow in splenic vein on color Doppler. Chronically infarcted spleen shows a shrunken small spleen with calcifications or with multiple hyper-echoic areas or a diffusely calcified small spleen.

CECT abdomen shows the findings mentioned above in better detail and has higher sensitivity for splenic infarcts and splenic torsion than ultrasound. Contrast enhanced CT gives vital information about the extent of splenic infarction (whether focal or global infarction) i.e. the viability of splenic parenchyma. The latter information is very useful from management point of view when splenectomy is considered especially in children [3]. Infarcted spleen obviates spleen preserving surgery. CT also provides useful information about the status of vascular pedicle, splenic venous or arterial twisting, thrombosis, associated arterial aneurysm (as in this case) or presence of varices, other associated complications like entanglement of adjacent viscera in the twisted pedicle. If arterial occlusion has also occurred in torsion, then the spleen shows non-enhancing areas or shows diffuse lack of enhancement on portal venous phase. Huai-Tzu, Michael Liu and Kenneth K. Lau showed unusual association of wandering spleen with gastric volvulus [5]. Safia F. A. Maksoud et al reported secondary involvement of liver in form of altered hepatic perfusion due to torse spleno-portal confluence and segmental portal vein thrombosis [7]

MRI has a primary advantage in children due to lack of ionizing radiation. The lack of splenic tissue in the left upper quadrant and the ectopic splenic tissue is easily detected on T1- and T2-weighted sequences [8]. CEMRI shows splenic infarcts as wedge shaped areas hypointense in T1 & T2WI, with no enhancement following contrast administration. Status of adjacent viscera can be assessed whether they are entangled within the twisted pedicle [9].

ROLE OF IMAGING

Clinical diagnosis is not always easy. Imaging plays an important role not only in establishing this rare diagnosis but helps in assessing associated complications and assists in pre-operative planning. Diagnosis is easier with ultrasound and Doppler and CECT. Viability of splenic parenchyma, the length and anatomy of splenic vessels, presence of torsion, associated pancreatic tail tissue within the torse pedicle, varices etc. is useful important information that a radiologist has to provide. Ultrasound has a lower sensitivity than CT or MRI for acute infarcts or splenic torsion. CECT with angiography or CEMRI with angiography help out in this regard for pre-operative planning.

COMPLICATIONS OF WANDERING SPLEEN

Torsion, infarction, gangrene, splenic abscess, variceal hemorrhage, pancreatic necrosis, gastric volvulus.

TREATMENT

Recommendations for treatment vary greatly among various authors. For children and adults under 20 yrs of age with non-infarcted spleen, splenopexy is the treatment of choice before the onset of infarction because of high risk of post-splenectomy sepsis. In adults over 20 years, splenectomy or splenopexy can be done. Some surgeons prefer to preserve the immune function of spleen and recommend splenopexy even in adults. In acute or chronic torsion, splenectomy is the treatment of choice [10]. To prevent post-splenectomy sepsis, vaccination for encapsulated organisms is performed 1 to 2 weeks after splenectomy.

ABBREVIATIONS

CECT Contrast enhanced computed tomography.

CEMRI Contrast enhanced Magnetic resonance imaging

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Conflicts of interest

There are no conflicts of interest.

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