

A wandering spleen presenting as a pelvic mass: case report and review of the literature

S. Zarrintan¹, F. Jamali^{2, 3}, R.S. Tubbs⁴, A.A. Khaki⁵, A. Salavati⁶, A. Tanoomand⁷

¹Student Research Centre and Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran

²Maragheh Amirmomenin Hospital, Maragheh, Eastern Azerbaijan, Iran

³Maragheh Islamic Azad University, Maragheh, Eastern Azerbaijan, Iran

⁴Section of Pediatric Neurosurgery, University of Alabama at Birmingham and Children's Hospital, Birmingham, Alabama, USA

⁵Department of Anatomical Sciences, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran

⁶Students' Scientific Research Centre and Faculty of Medicine, Tehran University of Medical Sciences, Tehran, Iran

⁷Maragheh Faculty of Nursery and Midwifery, Tabriz University of Medical Sciences, Eastern Azerbaijan, Iran

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Wandering spleens are rare clinical entities found more commonly in females. We report a young female patient found to harbour a pelvic spleen. The literature regarding this rare ectopia is reviewed. The wandering spleen should be considered in the differential diagnosis of pelvic masses.

Key words: spleen, pelvis, ectopic

INTRODUCTION

Lack of fixation of the spleen in its normal position in the left upper quadrant of the abdomen may result in splenic mobility. This uncommon condition is referred to as a "wandering spleen" [1, 5, 9]. It is postulated that major supporting ligaments of the spleen are abnormally lax or elongated in patients with a wandering spleen, allowing the organ to migrate to the lower abdomen or, rarely, the pelvis [1, 5, 11, 12]. The incidence of wandering spleen is 15 times greater in women than in men, especially in women aged 20–40 [9], which may be due to the hormonal effects of pregnancy [1].

CASE REPORT

A 20-year-old nulliparous woman presented with periumbilical pain one day prior to admission. The pain was followed approximately 5 hours later by pain in her right lower quadrant, which was exacerbated with movement. She also complained of anorexia. During physical examination the surgeon observed mild tenderness and rebound tenderness in the right lower quadrant. With leukocytosis, right

lower quadrant pain and fever, the patient was prepared for appendectomy. Sonographic examinations failed to locate the spleen in its normal position, and an abnormal low-echoic homogeneous soft-tissue mass was detected in the left side of the pelvis (Fig. 1). In computed tomography imaging the unknown mass had characteristics consistent with the spleen (Fig. 2). Doppler imaging showed normal blood flow in the suspected ectopic splenic vessels and the patient therefore underwent surgery for acute appendicitis and correction of a pelvic spleen. The primary diagnosis of acute appendicitis was confirmed by pathology studies. A splenopexy was performed. Four months after the treatment ultrasonography was performed and revealed a normally located spleen.

DISCUSSION

Wandering spleens, also referred to as "ectopic", "proptotic", "floating", "displaced" and "aberrant" spleens are rare clinical entities [1, 5, 9, 11, 12]. Most textbooks do not consider this in the differential diagnosis of pelvic masses. The spleen begins development in the fifth week of gestation from

Address for correspondence: R.S. Tubbs, PhD, Paediatric Neurosurgery, Children's Hospital, 1600 7th Avenue South ACC 400, Birmingham, Alabama 35233, USA, tel: 205 939 9914, fax: 205 939 9972, e-mail: rstubbs@uab.edu



Figure 1. Ultrasound of the wandering spleen as seen in our patient. LK — left kidney; SP — spleen.



Figure 2. Computed tomography of the pelvis noting the abnormally positioned spleen (arrow) within the pelvis.

mesenchymal cells in the dorsal mesogastrium [12]. The dorsal mesogastrium is also responsible for the formation of the peritoneum, the greater omentum and several peritoneal folds [1]. The major support-

ing ligaments of the spleen are the gastrosplenic, phrenocolic, splenorenal, and splenocolic ligaments. Potential aetiologies for a wandering spleen include a congenital abnormality of its peritoneal attachments or an acquired laxity of these ligaments [1, 12].

Although rare, a wandering spleen is more often seen in young multiparous women [9]. Potentially predisposing elements in this population include multiparity and abdominal laxity [5, 12], thought to be secondary to pregnancy-induced hormonal effects on the abdominal wall. In addition, splenomegaly may predispose one to a proptotic spleen [12]. The clinical presentation of a wandering spleen is variable. It may be manifest clinically as an abdominal mass or abdominal pain. Abdominal pain will be experienced by 60% of patients, and the remainder will be asymptomatic [9]. If pain is present, it may be chronic, intermittent or acute [9, 12]. Prompt diagnosis is necessary to prevent complications such as splenic torsion with resultant splenic infarction [10], gastric volvulus [13] or acute pancreatitis [6]. On physical examination there may be a hard ovoid palpable pelvic mass with a notched edge. The mass may move painlessly toward the left upper quadrant, but movements in other directions may be limited or painful. There will also be resonance to percussion in the left upper quadrant. The wandering spleen may be normal in size or enlarged [1].

Whereas in the past most cases were diagnosed during exploratory laparotomy [4], the diagnosis is now usually established by means of imaging [4, 11]. Abdominal sonography [11] is currently the first mode of evaluation for abdominal pain or masses. As ultrasonography can easily be repeated and, as it portrays the shape and position of the spleen on a real-time basis, the preoperative diagnosis of a wandering spleen is possible. With advances in ultrasonographic technology, such as colour Doppler imaging and power Doppler imaging, the occurrence of torsion or infarction of the spleen can easily be confirmed. Ultrasonography is therefore a simple and useful method for diagnosing a wandering spleen in patients who complain of intermittent left hypochondralgia, especially in women following childbirth [16]. Because the imaging characteristics may differ from patient to patient, it is important to have accurate information about this entity in order to make a conclusive and correct diagnosis [8]. Computed tomography scans or magnetic resonance imaging are also occasionally used. These imaging studies may show an abdominal or pelvic mass, loops of intestine in

the left upper quadrant instead of the normally located spleen, an elevated left kidney or gastrointestinal obstruction [5, 9]. Laboratory evidence of leukocytosis, platelet abnormalities and anaemia may be present but are not necessary or diagnostic [9]. Pancreatitis may also result from incorporation of the tail of the pancreas into the spleen's vascular pedicle [3]. Diagnosis, however, may be difficult before surgical management. In a review of 237 cases published in 1992 only 27% were diagnosed preoperatively [1]. However, with advances in ultrasonography techniques, the preoperative diagnosis of a wandering spleen has become more common [8, 11, 15, 16].

Treatment options include observation, splenectomy or splenopexy. In children observation is often the initial recommended treatment. Because of the high risk of complications and the increased risk of trauma to an unprotected abnormally located spleen, wandering spleen is treated surgically by either splenopexy or splenectomy in all patients, even those who are asymptomatic [2, 7]. Its clinical appearance assumes various forms, with the most common complication being torsion of the spleen. Because this acute torsion often causes infarction of the spleen, splenectomy may be inevitable [14]. If the diagnosis is made before severe complications occur, elective laparoscopic splenopexy is now considered the treatment of choice. Post-splenectomy septicaemia is one of the major risks of removing the spleen. Patients who have undergone splenectomy are at increased risk of infection, especially with encapsulated organisms, such as *Streptococcus pneumoniae*, *Neisseria meningitidis* and *Haemophilus influenzae*. Secondary to complications related to splenectomy, there has been a greater trend toward more conservative surgical management with splenopexy [7]. Splenopexy can be performed with various techniques, including the creation of an extraperitoneal pocket, colonic displacement, suture fixation or reinforcement pockets made of mesh or omentum [7].

In conclusion, wandering spleen is a rare entity but must be considered in patients with an abdominal or pelvic mass. The clinical presentation ranges from asymptomatic to an acute surgical abdomen. Diagnosis, if made preoperatively, can usually be reached by ultrasound with or without Doppler studies.

Treatment options include observation, splenectomy, and splenopexy. The risks and benefits of these treatments must each be considered and tailored to the individual patient.

REFERENCES

1. Allen KB, Gay BB, Skandalakis JE (1992) Wandering spleen: anatomic and radiologic considerations. *South Med J*, 85: 976.
2. Benevento A, Boni L, Dionigi G (2002) Emergency laparoscopic splenectomy for "wandering" (pelvic) spleen: case report and review of the literature on laparoscopic approach to splenic diseases. *Surg Endosc*, 16: 1364–1365.
3. Benoist S, Imbaud P, Veyrieres M (1998) Reversible hypersplenism after splenopexy for wandering spleen. *Hepatogastroenterology*, 45: 2430–2431.
4. Brown CV, Virgilio GR, Vazquez WD (2003) Wandering spleen and its complications in children: a case series and review of the literature. *J Pediatr Surg*, 38: 1676.
5. Buehner M, Baker MS (1992) The wandering spleen. *Surg Gynecol Obstet*, 175: 373.
6. Choi YH, Menken FA, Jacobson IM (1996) Recurrent acute pancreatitis: an additional manifestation of the "wandering spleen" syndrome. *Am J Gastroenterol*, 91: 1034.
7. Cohen MS, Soper NF, Underwood RA, Quasebarth M, Brunt LM (1998) Laparoscopic splenopexy for wandering (pelvic) spleen. *Surg Laparosc Endosc*, 8: 286–290.
8. Danaci M, Belet U, Yalin T, Polat V, Nurok S, Selcuk MB (2000) Power Doppler sonographic diagnosis of torsion in a wandering spleen. *J Clin Ultrasound*, 28: 246.
9. Desai DC, Hebra A, Davidoff AM (1997) Wandering spleen: a challenging diagnosis. *South Med J*, 90: 439.
10. Greig JD, Sweet EM, Drainer IK (1994) Splenic torsion in a wandering spleen presenting as an acute abdominal mass. *J Pediatr Surg*, 29: 571.
11. Karmazyn B, Steinberg R, Gayer G (2005) Wandering spleen — the challenge of ultrasound diagnosis: report of 7 cases. *J Clin Ultrasound*, 33: 433–438.
12. Lewis GA, Byrne MP (1981) Wandering spleen. *Am Surg*, 47: 275–277.
13. Lin CH, Wu SF, Lin WC (2005) Wandering spleen with torsion and gastric volvulus. *J Formos Med Assoc*, 104: 755–758.
14. Nemcek AA, Miller FH, Fitzgerald SW (1991) Acute torsion of a wandering spleen: diagnosis by CT and duplex Doppler and color flow sonography. *Am J Roentgenol*, 157: 307–309.
15. Satyadas T, Nasir N, Bradpiece HA (2002) Wandering spleen: case report and literature review. *J R Coll Surg Edinb*, 47: 512–514.
16. Wen YL, Kudo M, Maekawa K (2001) Sonographic findings of wandering spleen. *J Gastroenterol*, 36: 643–644.