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Case Report

Surgery Section

# Non-surgical Management of Splenic Volvulus and Infarction of Ectopic Spleen in an Adult Female: A Case Report

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## ABSTRACT

Ectopic spleen, or Wandering Spleen (WS), is a rare condition caused by laxity of splenic suspensory ligaments. While often asymptomatic, it may present with life-threatening complications such as torsion and infarction. We present a case of a 41-year-old female with a history of breast cancer who developed left-sided abdominal pain. Imaging confirmed an ectopic spleen in the pelvis resting on the urinary bladder, receiving its blood supply from the coeliac trunk. Computed Tomography (CT) also showed a well-demarcated area of non-enhancement at its inferior pole, along with twisting of the vascular pedicle associated with surrounding free fluid representing splenic volvulus and infarction. Enoxaparin 72 mg SQ BID was initiated for concurrent splenic vein thrombosis, and the patient was discharged on Rivaroxaban 20 mg PO OD. Over 16 months, serial imaging showed resolution of infarction and maintained splenic vascularity without surgical intervention. This case demonstrates that conservative management of WS with infarction may be viable with close monitoring and anticoagulation.

**Keywords:** Computed tomography, Torsion, Wandering spleen

## CASE REPORT

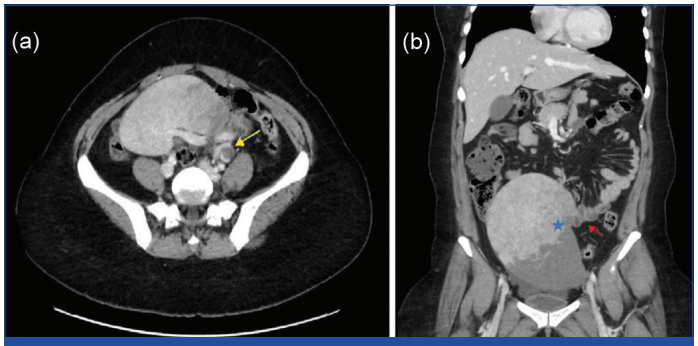
A 41-year-old Saudi female presented to the Emergency department complaining of severe left-sided abdominal pain for five days. The pain was radiating to the lower back. She reported multiple episodes of vomiting and constipation. The last bowel motion was three days ago, but she was able to pass flatus. The patient denied any urinary tract and gynaecological symptoms, chills, diarrhoea, previous similar attacks, and trauma.

She was a known case of left breast cancer diagnosed in 2014 (T3 N1 M0, triple negative). In 2015, the patient underwent a modified radical mastectomy, as she received neoadjuvant chemotherapy and adjuvant radiotherapy. A year later, she had a left breast reconstruction with a latissimus dorsi flap and implant insertion. One year later, she underwent left nipple reconstruction and tattooing.

On physical examination, the patient was afebrile (37°C), haemodynamically and respiratory stable with a blood pressure of 100/75 mmHg, heart rate of 101 bpm, and respiratory rate of 18 cpm. The abdomen was symmetrical with no distention. On palpation, the abdomen was soft and lax with significant suprapubic tenderness, and no masses were identified. Rectal examination was unremarkable.

Laboratory investigations were within acceptable ranges, which included inflammatory markers, complete blood count, liver function tests, and renal function tests.

Abdomino-pelvic Contrast-Enhanced Computed Tomography scan (CECT) was done and it showed a large ectopic spleen measuring 17 cm in long axis, located in the pelvis and resting on the dome of the urinary bladder. It received its blood supply from the coeliac trunk, resulting in inferior displacement of the pancreatic tail. It demonstrated a well-demarcated area of non-enhancement at its inferior pole along with twisting of the vascular pedicle (swirl sign), representing splenic volvulus and infarction. Thrombosis of the distal tributary of the splenic vein was also identified [Table/Fig-1].




**[Table/Fig-1]:** Axial (a) Contrast-Enhanced CT (CECT) scan image showing a swirl sign of the twisted splenic vascular pedicle (yellow arrow), demonstrated as a well-demarcated area of non-enhancement; Coronal (b) CT scan illustrating the ectopic spleen hilum (blue asterix) is facing left laterally, partially hypodense, and non-enhanced post contrast injection exhibiting signs of splenic volvulus and infarction. Torsion of the vascular pedicle is also shown (red arrow).

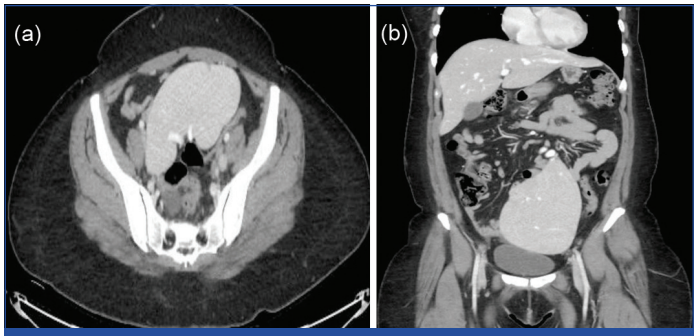
Pelvic ultrasonography was performed for further spleen assessment, which revealed an enlarged ectopic spleen measuring 17 cm in long axis. The parenchyma was homogeneous with no definite focal lesion. Additionally, Doppler sonography was done, and the spectral waveforms clearly illustrated venous and arterial flow in the splenic tissue [Table/Fig-2].

The most likely diagnosis was provoked splenic vein thrombosis; thus, therapeutic Enoxaparin 72 mg SQ BID was initiated and then continued with Rivaroxaban 20 mg PO OD. Indefinite anticoagulation was advised, and initially switched from low-molecular-weight heparin to rivaroxaban 20 mg PO OD for less than a month. The patient was not compliant with the medication due to menorrhagia and was switched to warfarin 7 mg PO OD.

Regarding the ectopic spleen, management options and potential complications were clearly discussed with the patient by the general surgery team. The patient was against any surgical intervention and preferred to pursue conservative management. A follow-up CT scan after eight months showed the ectopic spleen, resting on the dome of the urinary bladder. Interval resolution of the previously noted

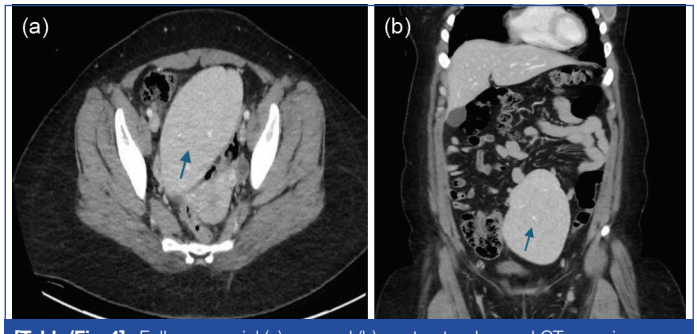
**[Table/Fig-2]:** Doppler sonography demonstrating arterial and venous flow in the ectopic spleen.

splenic inferior pole infarction was noted. The splenic parenchyma is homogeneous, with interval resolution of the splenic vein thrombus [Table/Fig-3].




**[Table/Fig-3]:** Follow-up axial: (a) coronal (B) contrast-enhanced CT scan image showing interval resolution of the splenic vein thrombosis compared to the previous CT scan.

The last abdomino-pelvic CT scan obtained was 16 months after her presentation. It showed the ectopic spleen located in the same position on the dome of the urinary bladder. However, the size of the spleen had significantly decreased to a normal size, measuring 11 cm in the long axis, with normal vascularity. The splenic parenchyma is homogenous and enhanced with complete resolution of the splenic thrombus. Stable multiple collateral venous structures adjacent to the splenic hilum and pancreatic tail were identified [Table/Fig-4].




**[Table/Fig-4]:** Follow-up axial (a), coronal (b) contrast-enhanced CT scan image shows an ectopic spleen, normal in size and vascularity (blue arrow).

In this case, conservative management was evidently effective in treating this patient, allowing spontaneous reperfusion of the ectopic spleen.

## DISCUSSION

Ectopic spleen, also referred to as WS, is an unusual clinical malformation in which the spleen is displaced lower in the abdomen or pelvic region [1]. It is a rare diagnosis with reported incidence as low as 0.16% [2]. The most common affected age group is children, comprising one-third of all cases. However, amongst adults, females are 15 times more common compared to males, mainly distinguished between 20-40 years of age [3-5].

Clinical manifestations include nausea, vomiting, pelvic mass, early satiety, and intermittent abdominal pain. Nevertheless, many patients with ectopic spleen are asymptomatic and are first diagnosed with the occurrence of complications. In such a scenario, patients could present with intestinal obstruction or splenomegaly due to chronic torsion [6,7].

It can originate from congenital or acquired defects. While the pathophysiology of congenital WS remains unexplained, many studies associate it with the maldevelopment of the mesogastrium dorsum during the embryonic period [8]. The failure of this process disrupts the retroperitoneal fixation and results in the absence of splenocolic, splenorenal and splenophrenic ligaments. Therefore, splenic ligaments are replaced with an intra-abdominal hypermobile mesenteric vascular pedicle. Consequently, the spleen becomes more susceptible to torsion, ischaemia, and infarction [9]. On the other hand, acquired WS results from one or more weakened splenic ligaments. This condition can be influenced by multiple factors, such as abdominal hyperlaxity, splenomegaly, gastric distension, pregnancy, and abdominal trauma [10].

Our team has identified 24 published cases of ectopic spleen managed surgically in the literature [Table/Fig-5] [6,11-27]. These cases have all been surgically managed, while only a few published studies talk about the conservative management. Inggriani S et al., present three cases, two of which have been managed conservatively, but no details have been provided on the conservative management they undertook [28]. Nhungo CJ et al., present a case that was also managed conservatively with no operative intervention needed, but no details were mentioned or infarction to the spleen [29].

As the clinical presentation and laboratory workup are non-specific, imaging forms the main foundation of detecting an ectopic spleen. Diagnostic modalities include CT scans, magnetic resonance imaging, Doppler sonography and ultrasound. Since imaging confirms the diagnosis and rules out mimickers, it has been established as the investigation of choice [10,11]. Possible CT scan findings include the presence of the dislocated spleen, homogenous or heterogenous splenic parenchyma with loss of attenuation, evidence of torsion, involvement of other viscera, or vascular compromise [24,26].

Treatment of ectopic spleen has evolved throughout the years. Historically, the treatment of choice for WS was splenectomy. Nowadays, either open or laparoscopic splenopexy is increasingly

| Case # | Author | Age | Gender | Presentation | Splenectomy | Location | Management |
|---|---|---|---|---|---|---|---|
| 1 | Blouhos K et al., [6] | 46 | M | Mild pain | No | Pelvic | Emergency splenectomy |
| 2 | Xiao M et al., [11] | 34 | F | Asymptomatic | No | Pancreatic tail | Splenectomy |
| 3 | | 39 | M | Asymptomatic | yes (16 y ago) | Liver (Segment 2) | Splenectomy |
| 4 | | 57 | M | Asymptomatic | yes (4y ago) | Liver (Segment 2) | Splenectomy |
| 5 | Guo H et al., [12] | 15 | F | Recurrent pain (2 y) | No | Hypogastrium/ pelvic cavity | Splenectomy |
| 6 | Balubaid I et al., [13] | Middle age | M | NM | yes | Gastric subepithelium | NM |
| 7 | Grambow E et al., [14] | 53 | M | Asymptomatic | yes (9yrs ago) | Liver (Segment 3 & 4b) | Splenectomy |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8 | Alfahad A et al., [15] | 78 | M | Asymptomatic | No | Lung (Right lower lobe) | None |
| 9 | El Ouzzani LC et al., [10]* | 26 | F | Abdominal pain and bilous vomiting | No | Left anterolateral umbilical level | Splenectomy |
| 10 | Granel B et al., [16]* | 18 | F | Acute abdominal pain | No | Epigastrium and hypocondrium | Splenectomy |
| 11 | Liu W et al., [17] | 37 | M | Asymptomatic | Yes (24 yrs ago) | Liver (Segment 2/4 of left lobe) | Splenectomy |
| 12 | | 39 | M | Asymptomatic | Yes (20 yrs ago) | Liver (Segment 2) | Splenectomy |
| 13 | Sansone V et al., [18] | 46 | M | Asymptomatic | Yes (15 yrs ago) | Liver (Segment 5) | Splenectomy |
| 14 | Dölle M et al., [19] | 62 | M | Epigastric pain | No, Splenic rupture history | Liver (Segment 2) | None |
| 15 | Ota T and Ono S [20] | 31 | M | Asymptomatic | NM | Intrapancreatic | NM |
| 16 | Yankov I and Boyanov N [21] | 10 | M | Asymptomatic | NM | Intrapancreatic | None |
| 17 | Zhong X et al., [22] | 55 | M | Upper abdominal cramping | yes (30 yrs ago) | Liver | Excision |
| 18 | Kruger R and Freeman S [23] | 56 | M | Asymptomatic | yes | Pelvic | None |
| 19 | Lahiri S et al., [24]* | 18 | F | Severe abdominal pain and distension | NM | NM | Splenectomy |
| 20 | Brown CVR et al., [25] | 9 | M | Abdominal pain | No | NM | Splenopexy |
| 21 | | 6 | F | Abdominal pain and vomiting | No | NM | Splenopexy |
| 22 | | 19 | F | Vomiting, Obtispation, and irritability | NM | RLQ | Splenopexy |
| 23 | Viana C et al., [26] | 40 | F | Upper abdominal pain with nausea and vomiting | No | Left flank | Splenectomy |
| 24 | Luo J et al., [27] | 49 | F | Asymptomatic | No | Tail of pancreas | Splenectomy |

**[Table/Fig-5]:** Summary of the findings of similar published cases from literature [6,10-27].

used as an alternative management. Splenopexy is a spleen-preserving technique that can be applied in the absence of massive splenomegaly or infarction, preventing spleen mobilisation [30].

## CONCLUSION(S)

Despite the accessible diagnostic modalities, ectopic spleen continues to be a diagnostic challenge requiring a high index of suspicion. It is an infrequent condition with broad-spectrum presentation, ranging from asymptomatic to an acute surgical abdomen. The favourable clinical outcome of this case suggests that non-operative management is a possible alternative to unwarranted surgical intervention, especially if applied to selected stable cases of infarcted ectopic spleen.

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