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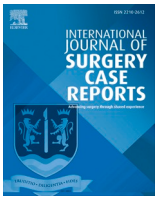

Case report

Wandering spleen causing small bowel obstruction: Laparoscopic surgical treatment (with video)

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ABSTRACT

Introduction: Wandering spleen (WS) is a clinical entity in which the spleen is not located in its normal anatomical site. Few cases have been reported, mainly in women of childbearing age. This condition can be congenital or acquired due to excessive elasticity of the spleen's suspensory ligaments. WS may cause acute complications requiring emergency surgery, especially related to the rotation of its vascular pedicle, leading to chronic or acute ischemia. The aim of the present case is to show a rare complication of WS, small bowel obstruction (SBO), and its management.

Presentation of case: We report the case of a 40-year-old female presenting with abdominal pain, nausea, and vomiting. CT scan showed SBO caused by WS located in the pelvis with an enlarged spleen vascular pedicle (SVP).

Laparoscopic exploration, splenectomy, small bowel resection and anastomosis were performed.

Discussion: WS may cause chronic or acute complications, mainly linked with enlargement and torsion of SVP, including acute ischemia and spleen necrosis, or compression of the near organs such as small intestine, stomach, pancreas. The diagnosis is based on physical examination, CT scan and blood exams. Generally, the WS's treatment is laparoscopic splenectomy or splenopexy. In case of vital spleen, splenopexy can be performed, in case of not vital spleen, splenectomy should be preferred.

Conclusion: This case provides an excellent example of SBO related to WS. In the video, the management of this complex situation is shown. In these cases, splenectomy represents a valuable option.

1. Introduction

Wandering spleen (WS) is a rare clinical entity in which the spleen is not located in its normal anatomical site but in other parts of the abdomen or pelvis. Fewer than 500 cases have been reported in the literature [1]. Two/thirds of cases occur in adults, mainly in women of childbearing age (20–40 years) with male: female ratio of 1:7, probably for hormonal changes during pregnancy leading to ligamentous laxity [2,3]. It can be congenital: related to alterations of the dorsal mesogastrium development; or acquired, due to laxity or excessive elasticity of the spleen's suspensory ligaments, favored by pregnancy, splenomegaly, or previous abdominal surgery [1]. As a result, the SVP is predisposed to lengthening and to hilar torsion with vascular pedicle's rupture, acute splenic ischemia and hemoperitoneum. In rare cases, the WS can cause SBO [4]. At our knowledge, only a few cases have been reported of SBO related to WS. This case was reported in accordance with the SCARE criteria [11].

2. Presentation of case

A forty-year-old patient was referred to the emergency department with abdominal pain and vomiting. Her vital signs were normal, and the physical examination showed abdominal distension with widespread tenderness. She reported no evacuation for 2 days. Her body mass index (BMI) was 32, and her medical history included two spontaneous childbirths and an open appendectomy at the age of 10.

Physical examination revealed a palpable mass in ipogastrium, no objective alterations were shown performing digital rectal exam. Laboratory exams showed piastrinopenia at 105.0 * 10^3/mm^3 platelets, (normal value at our hospital = 140–400 * 10^3/mm^3) and high D-

Abbreviations: WS, wandering spleen; SBO, small bowel obstruction; SVP, splenic vascular pedicle; CT, computed tomography.

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dimer at 1043.0 ng/ml (normal value at our hospital ≤ 243.0 ng/ml).

She underwent abdominal CT scan showing a WS in the pelvis measuring 14 × 14 × 13 cm, with abundant intra-abdominal fluid and ileal distention until the last ileal loop which was not distended. The area of the ileal obstruction was near to the WS. A filiform splenic artery descending into the pelvis and divided into multiple collateral vessels was seen, no infarction areas in the WS were seen at the CT scan (Fig. 1).

The patient underwent hematologic, urologic, and gynecologic evaluation and general surgery evaluation which made diagnosis of SBO. Indication for laparoscopic exploration was posed.

As shown in the Video, at laparoscopic exploration, clear abdominal fluid was present. The ileum was dilated. The spleen was located into the pelvis and large vessels surrounded the spleen, especially the spleen hilum. The last ileal loop causing SBO was detected: it was tenaciously adherent to the spleen and the bowel caliber was modified at that site as diagnosed by preoperative CT scan (Fig. 2). The adherences between the abdominal wall and the omentum were sectioned. The caecum and the ileus were identified. Then, the SVP was isolated, it was impossible to move the spleen from his location due to the multiple ectopic blood vessels and adherences with the pelvic abdominal wall. The adherences were removed, and the spleen was partially mobilized, allowing better visualization of the uterus and right ovarium.

The volvolated ileus loop was then visualized as tenaciously adhered to the spleen's tissue, the ileal loop was separated from the spleen and the SVP was cut using a laparoscopic stapler with vascular load.

After that, the spleen was fully mobile. When the ileal loop was finally freed, it was possible to derotate the bowel putting it in the physiological position. The spleen was positioned in the pelvis and extracted from a Pfannenstiel incision. WS diameters were 15 × 12 × 5,5 cm (Fig. 3).

After that, the small bowel portion that was adherent to the spleen was resected and a latero-lateral ileo-ileal antiperistaltic anastomosis was fashioned with a mechanical stapler, using a wound protector rectactor to protect the abdominal wall of the Pfannenstiel incision. The surgical specimen was sent for histological examination. A drain was placed in the pelvis.

The histological exam showed WS parenchyma with ectasias and subcapsular vascular congestion, phenomena of vascular thrombosis and foreign body giant cells.

The patient developed postoperative portal vein thrombosis diagnosed at postoperative day 5, which resolved with low molecular weight heparin treatment after 2 weeks. She was discharged at postoperative day 8 with domiciliary antithrombotic prophylactic therapy with enoxaparine and analgesic therapy.

Prophylactic vaccines: anti-Pneumococcal (PCV 13 and PCV 23), anti-*Haemophilus influenzae* type B, anti-Meningococcyc ACYW135 and B were performed at 14 days after the surgery.

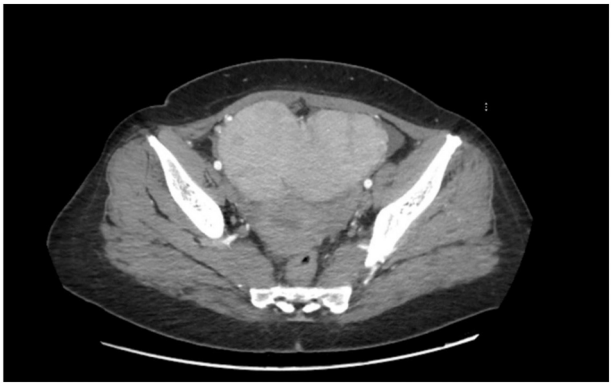

Fig. 1. CT scan of the patient's abdomen demonstrating WS in the pelvis.

3. Discussion

WS can be associated to different clinical scenarios. Two/thirds of patient presenting WS are adults, especially women of childbearing age with a male: female ratio of 1:7. There is also a connection between ligamentous laxity lead by hormonal changes during pregnancy: the reported patient had two spontaneous childbirths.

It is well known that WS can cause enlargement of SVP [1–4]. This condition can lead to reassessment and re-torsion of the spleen causing chronic spleen ischemia with splenomegaly and neo angiogenesis. Splenomegaly is strictly linked with reduced platelets count and leucopenia due to the splenic blood sequester [1].

On the other side, the enlargement and rotation of the SVP is linked with higher risk of acute splenic ischemia and necrosis and hemorrhage due to SVP's torsion [5] and rupture. This condition can cause acute abdomen and need of immediate emergency surgery.

WS can also be associated, less frequently, with adherences and compression of the adjacent organs, such as small bowel, causing SBO [4] as in the present case.

Other complications can be gastric volvulus, duodenal compression, pancreatitis [5,10].

WS is normally diagnosed evaluating physical examination, CT scan and blood exams [3,5]. Abdominal ultrasound can be used but is less specific. Blood exams are normally characterized by lower platelets count, leucopenia due to the splenic blood cell sequester [3].

Generally, the WS's treatment is laparoscopic splenectomy or splenopexy [9], which are both safe and effective surgical options [1,5,6]. In case of acute abdomen due to acute spleen ischemia or hemorrhage in which the WS is not vital, the preferred treatment is splenectomy [5,9].

In case of vital spleen, especially in young patient, splenopexy is preferred due to the maintaining of the splenic function [5,7,9].

Splenopexy represents a more technically demanding procedure, and it may be associated to long-term recurrence due to displacement of the spleen for disruption of the fixation methods. Furthermore, in cases of potential bacterial contamination, fixation of the spleen with prosthesis may be contraindicated due to possible mesh infection during the postoperative period. It also should be highlighted that during the time splenopexy is becoming less frequent because of the improving of antisepsis techniques as vaccines, antibiotic prophylaxis, and patient's education, which ameliorate the outcomes after splenectomy. [8]

In this case laparoscopic splenectomy seemed the best option for 3 reasons:

1) WS was enlarged at macroscopic evaluation, appeared to suffer from chronic ischemia and was tightly adherent to the small bowel with no apparent cause.
   We estimated that was better to remove it, also in order to perform WS's and small bowel's pathological examination to obtain a clear diagnosis.
2) The SVP was enlarged and divided into multiple collateral dilated and tortuous vessels, and the spleen at laparoscopy seemed not well vascularized. In case of splenopexy, the SVP would have to provide blood supply to the spleen and we estimated a high risk of thrombosis looking at the SVP and at the spleen.
3) For splenopexy, usually a mesh is placed to suspend the spleen. However, SBO and small bowel resection may cause a potential contamination of the operative field and in these cases, if possible, we avoid the use of meshes.

4. Conclusion

In conclusion, this case provides an excellent example of emergency surgery for rare complication due to WS: SBO, showing its diagnosis and its management. In case of SBO with the need of small bowel resection, splenectomy represents a valid option, allowing to treat the obstruction and to prevent future complications due to the WS.

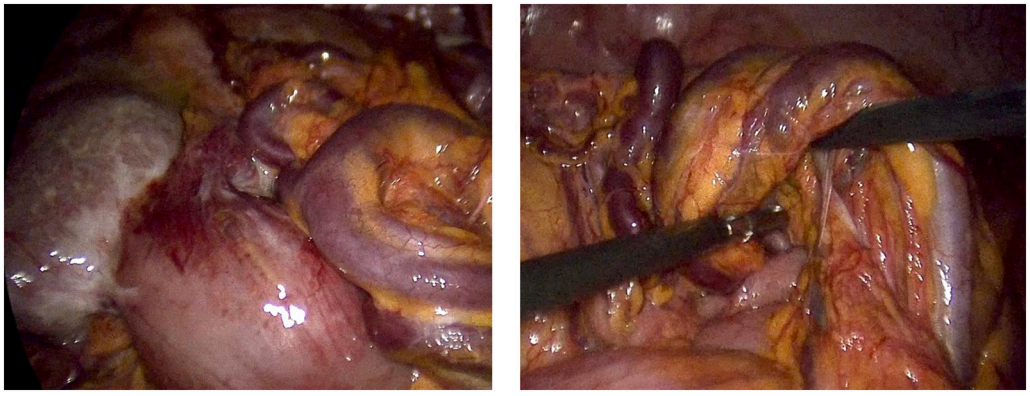

Fig. 2. At laparoscopic exploration is possible to see the volvolated ileus loop (Fig. A.) tenaciously adhered to WS's tissue. In Fig. B. VSP is isolated.

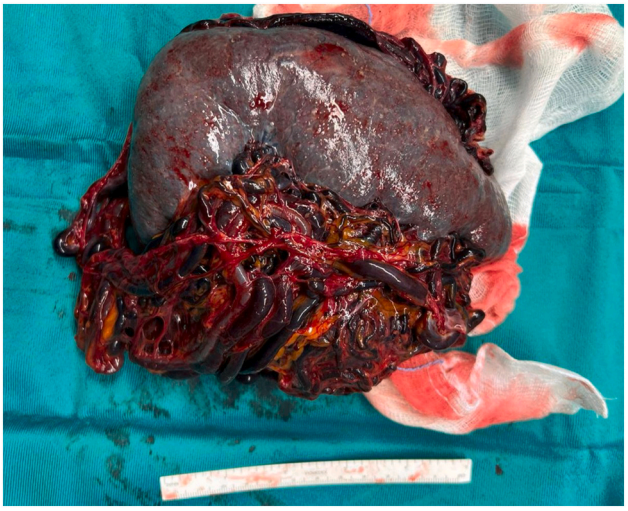

Fig. 3. WS, removed from the abdomen, spleen diameters were 15 × 12 × 5,5 cm.

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijscr.2023.108961.

Consent

Written informed consent was obtained from the patient for publication on this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal of request.

Ethical approval

As no experimental treatment was performed, this study is exempt from ethical approval in our institution (La Sapienza University of Rome). The patient was treated according to the standard of care of our Hospital. Patient approval has been given.

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Author contribution

Niccolò Petrucciani; Francesco D'Angelo; Paolo Aurello; Sara Claudia Barone – Supervision, Data curation, Writing, Review and Editing.

Sara Claudia Barone; Niccolò Petrucciani; Leonida Mucaj – Conceptualization, Data curation, Writing- Original draft.

Gianfranco Silecchia; Niccolò Petrucciani – Supervision, Data curation, Writing, Review and Editing.

All – approval of final manuscript.

Guarantor

Niccolò Petrucciani.

Registration of research studies

This case report is not a 'First in Man' study.

Conflict of interest statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. The authors have no competing interests to declare.

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