Pelvic Splenosis Mimicking an Ovarian Mass: A Non-Invasive Approach

Yakir Segev MD[1], Ofer Lavie MD[1], Yael Goldberg MD[1], Yuval Kaufman MD[1], Gil Peerl, Sara Gips MD[2], Dorit Eizenberg MD[3] and Ron Auslander MD[1]

Departments of [1]Obstetrics and Gynecology, [2]Nuclear Medicine and [3]Radiology, Carmel Medical Center, Haifa, Israel

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Splenosis is a term initially used by Buchbinder and Lipkoff in 1939 to describe the heterotopic transplantation of splenic tissue within the abdominal cavity [1]. It most often appears following a traumatic rupture of the spleen or after splenectomy. Splenic implants derive their blood supply from surrounding tissue and develop into mature functioning splenic tissue. The pathogenesis of splenosis is not well understood, and therefore it is not possible to predict when splenic implants will develop. The number of splenic implants does not correlate with the time since splenic rupture, the extent of damage to the spleen, or the amount of peritoneal blood during rupture. The diagnosis of splenosis is usually incidental since it is a phenomenon that has no clinical symptoms.

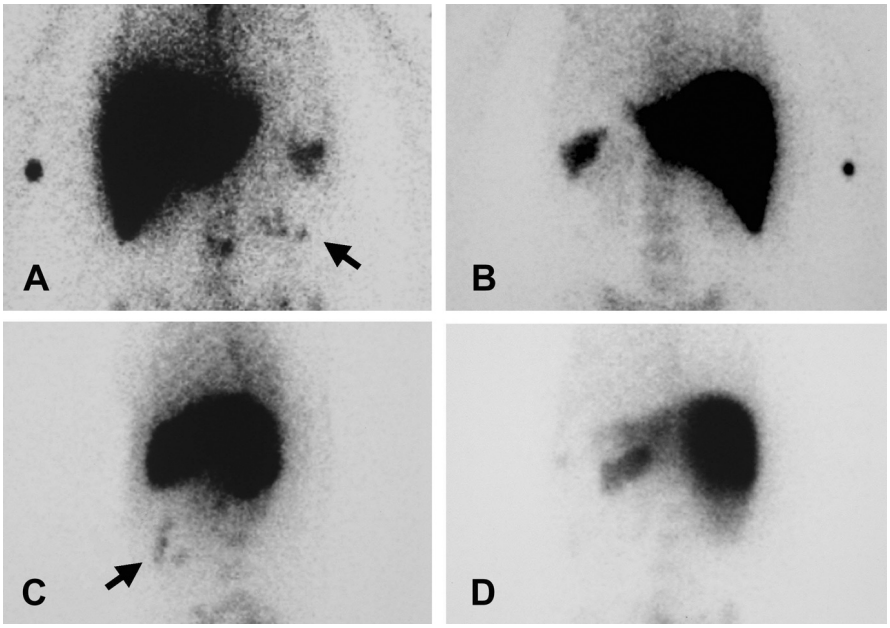
In previous publications, pelvic splenosis was misdiagnosed as endometriosis, carcinoma, hemangiomas or metastatic disease [2]. Both endometriosis and splenosis are characterized by diffuse peritoneal spread. An important differentiating factor between the two is the absence of intraperitoneal adhesions in cases of splenosis. When compared to malignant tumors, splenosis has a different gross appearance in terms of color and consistency [2]. In all previous reports in the literature, diagnosis of splenosis was achieved only via surgical exploration performed for a suspicious pelvic mass, followed by histopathological confirmation. To the best of our knowledge, this is the first report where a pelvic mass, which was mimicking enlarged pelvic nodes, was diagnosed as pelvic splenosis by non-invasive techniques.

Patient Description

A 57 year old Caucasian female was admitted to our gynecology clinic for left mild lower abdominal pain that had troubled her for the previous 6 months. Her past medical history revealed an abdominal trauma at the age of 11 managed with laparotomy and splenectomy. Ten years later the patient underwent a second laparotomy due to small bowel obstruction, resolved by lysis of bowel and peritoneal adhesions.

At admission, clinical examination showed mild abdominal tenderness in the left lower quadrant, with no peritoneal signs. Laboratory results were in the normal range. Transvaginal ultrasonogram revealed 2 x 2 cm and 1.5 x 2 cm solid masses adjacent to the left and right ovary respectively. The sonographic appearance of both masses resembled enlarged lymph nodes. No pelvic fluid was observed. Doppler flow studies of the ovaries and of the pelvic masses revealed blood flow with normal resistance indexes.

To further investigate the pelvic masses, abdominal and pelvic computed tomography scan was performed, using intravenous contrast material. A residual



^{99m}Tc sulfur colloid scintigraphy scanning. Images were obtained in the **[A]** anterior, **[B]** posterior, **[C]** left lateral and **[D]** oblique views.

small deformed, lobulated post-traumatic spleen was seen in the left upper abdomen, and multiple small nodules measuring up to 1.6 cm in diameter were seen in the upper abdomen and omentum, consistent with splenosis. Two small pelvic masses were noted, one on each side, showing similar density and appearance to the other nodules, suggestive of pelvic splenosis as well.

^{99m}Tc sulfur colloid scan is considered the gold standard for demonstration of liver and spleen tissue [3], and ^{99m}Tc sulfur colloid scintigraphy was subsequently performed with the re-infusion of technetium 99m-labeled heat-damaged autologous erythrocytes. Images were obtained at the anterior, posterior, left lateral and oblique views [Figures A-D]. The spleen scan revealed residual spleen due to partial splenectomy and several focal areas of uptake in the left quadrant below the residual spleen, consistent with accessory spleen. Liver tissue appeared normal

The patient was conservatively observed and at 1 year follow-up revealed a spontaneous resolution of the clinical complaints.

Comment

Since the first report of Buchbinder and Lipkoff in 1939 [1], fewer than 100 cases of splenosis were reported in the English-language medical literature of which only a minority appeared in the gynecological literature. The incidence of splenosis is unknown since it is usually an incidental finding at surgery or autopsy. It is estimated that the incidence among patients who have undergone post-traumatic splenectomy is 70% [4].

Splenosis should be considered in patients with traumatic rupture. Splenectomy for non-traumatic reasons may also lead to splenosis if splenic tissue is spilled on the peritoneal surface at the time of surgery or if morcellation extraction of the spleen was used. Investigations in mice showed that growth of ectopic splenic tissue can be affected if splenectomy is incomplete and the circulating mediators released by the residual spleen are active [4].

Splenosis is usually asymptomatic. However, it may cause pelvic pain, or it may present as a pelvic mass. The average reported interval between the spleen trauma and the diagnosis of splenosis is 19 years. Our patient had a 46 year interval between splenectomy and the final diagnosis. Complications directly related to splenosis are rare and include intestinal obstruction, intraabdominal hemorrhage caused by deep invasion of splenic implant into the bowel serosa, and torsion of the splenic implants [4].

The presumed diagnosis of splenosis can be made by the absence of Howell-Jolly bodies, sideroctyes and other post-splenectomy cellular abnormalities on a peripheral blood smear. There is evidence of functioning residual splenic tissue. In patients who have undergone splenectomy for hematological indications, return of the hematological disease indicates the presence of splenosis. Ectopic splenic tissue most frequently occurs in the abdominal cavity especially on the serosal surfaces of the small and large bowel, in the parietal peritoneum, the mesentery, and the diaphragm. Uncommon locations of splenosis have been reported, e.g., the female genital organs [2], the thoracic cavity [5], the brain or, as in our case, as an ovarian mass.

The only report in the English literature of splenosis diagnosed non-invasively was a case of diffused splenosis in the upper abdomen. Our case is the first case of pelvic splenosis that was diagnosed using non-surgical modalities. The diagnosis was achieved with a thorough medical history combined with imaging modalities such as CT and ultrasonography, which raised the possibility of pelvic splenosis. The definite diagnosis as suggested by Bidet et al. [3] was confirmed with the re-infusion of technetium 99m-labeled heat-damaged autologous erythrocytes. The limitation of this modality is that the re-infusion of technetium 99m-labeled heat-damaged autologous erythrocytes may detect only nodules larger than 2 cm, which can be identified as functioning splenic tissue [3].

Management of splenosis depends on the patient's symptoms. In general, it is accepted that asymptomatic implants should not be removed because splenic tissue may be immunologically functional and thus useful for the patient. Furthermore, unnecessary excisions of the implants may lead to serious bleeding and damage to the surrounding organs. For symptomatic patients, resection of the implants either by laparoscopy or laparotomy is the treatment of choice [2,4].

Our case emphasizes the rare diagnosing of pelvic splenosis in evaluating pelvic mass and the possibility of diagnosing pelvic splenosis on the basis of patient history and non-invasive imaging studies without the need of surgery and tissue evidence.

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Correspondence: Dr. Y. Segev, Dept. of Obstetrics and Gynecology, Carmel Medical Center, Haifa 34362, Israel.
Phone/Fax: (972-4) 822-0291
email: segevyakir@yahoo.com

There is a road from the eye to the heart that does not go through the intellect

G.K. Chesterton (1874-1936), British essayist and novelist