



Splenosis in patient undergoing robotic assisted laparoscopic radical prostatectomy

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ABSTRACT

Splenosis is a benign condition that is often found in patients with a history of trauma. Most cases are intra-abdominal due to direct seeding of surrounding structures. We report a case of splenosis in the pelvis found in a 59-year-old male during a robotic prostatectomy.

1. Introduction

Splenosis is caused by heterotopic auto-transplantation of splenic tissue after surgery or trauma. It is reported to occur in nearly 67% of patients with history of splenic injury, with the number of nodules of ectopic tissue correlating to the severity of splenic injury.¹ The implantation is often multi-focal, with peritoneal cavity as the most frequently affected anatomical space.

As patients are often asymptomatic, splenosis is usually discovered incidentally via imaging or intraoperative finding. Due to its multifocality and enhancement on imaging, splenic deposits can pose a significant diagnostic dilemma, being misdiagnosed as metastatic disease.² In this report, we present the case of a 59-year-old male with previous splenic rupture undergoing robotic prostatectomy with incidental finding of multiple splenic deposits through the pelvis.

2. Case presentation

59-year-old male with past surgical history of exploratory laparotomy following blunt injury as a child, presented with an elevated PSA of 5.1 ng/mL. His subsequent work up, including transperineal prostate biopsy, revealed multifocal Gleason 4 + 3 prostate cancer. MRI imaging demonstrated focal area of signal abnormality and enhancement within the apical to midportion of the peripheral zone classified as a PIRADS 4 lesion. Furthermore, 3T MRI imaging demonstrated several well-defined homogenous lesions lining posterior peritoneum, with hypointense rim around the masses with persistent lack of enhancement. Although the masses were suspicious for metastases based on imaging, the presence of

rim surrounding the lesions, lack of enhancement as well as patient's clinical history, we elected to proceed with robotic prostatectomy with bilateral pelvic lymph node dissection.

At the time of posterior dissection, multiple soft tissue masses were identified, as previously identified on the MRI (Fig. 1A, B, C). The lesions were large, multifocal, and prone to bleeding, without evidence of invasion to surrounding structures.

Frozen biopsies of these masses revealed lymphoid tissue deposition surrounding arteriole red and white pulp, consistent with splenic tissue (Fig. 2A and B). The capsule around the splenic deposits had deposition of hemosiderin and macrophage, consistent with history of previous trauma. (Fig. 2C).

3. Discussion

Splenosis results due to iatrogenic or traumatic fragmentation of the spleen, with subsequent deposition of pulp within peritoneal cavity. This auto-transplantation of splenic tissue most often occurs in gravity dependent fashion, resulting in seeding of the peritoneal cavity, and serosal peritoneal surfaces. Although they are benign, the greatest difficulty comes in radiographic distinction of more aggressive pathology such as metastatic disease. Despite their benign nature, due to the propensity to recruit blood supply, these deposits may become large resulting in rupture, particularly during trauma or surgery.³ Although many patients are asymptomatic, presence of large deposits may lead to episodic abdominal pain, small bowel obstruction, gastrointestinal bleeding, ureteral compression, and hydronephrosis.²

Noninvasive diagnostic imaging for splenosis is vital for accurate

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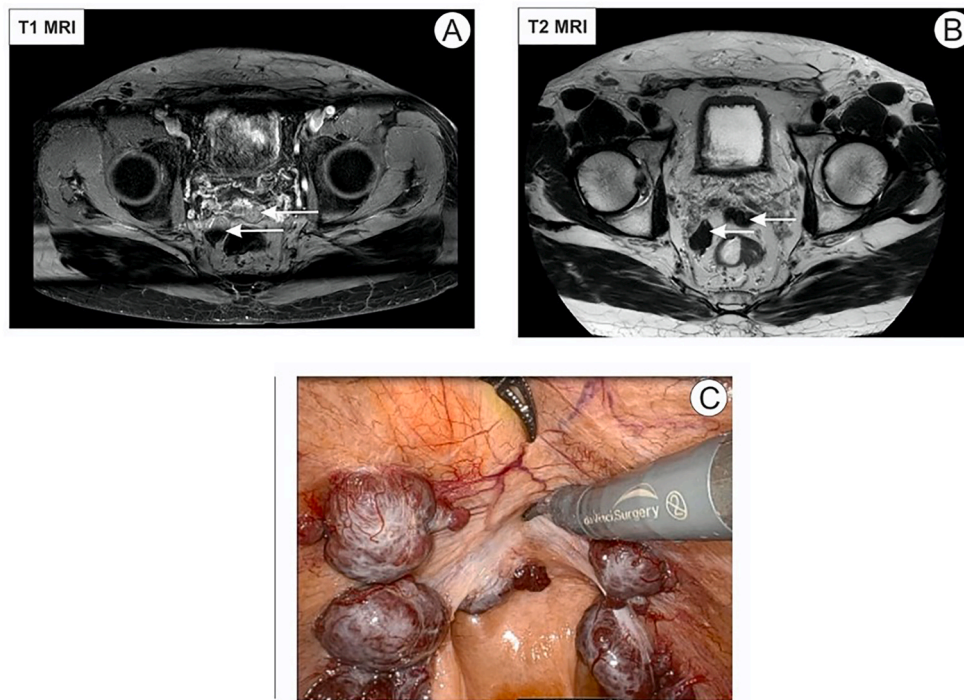


Fig. 1. A. Axial T1 imaging showing homogenous round structures on the posterior reflection of the peritoneum abutting peri-rectal fat. The structures are noted to have an enhancing rim pathognomonic for splenic deposits. B. T2 weighted image showing hypointense nodular lesions consistent with like content of hemosiderin, and blood of the splenic deposits. C. Soft tissue masses were incidentally discovered during RALP/PLND during posterior dissection.

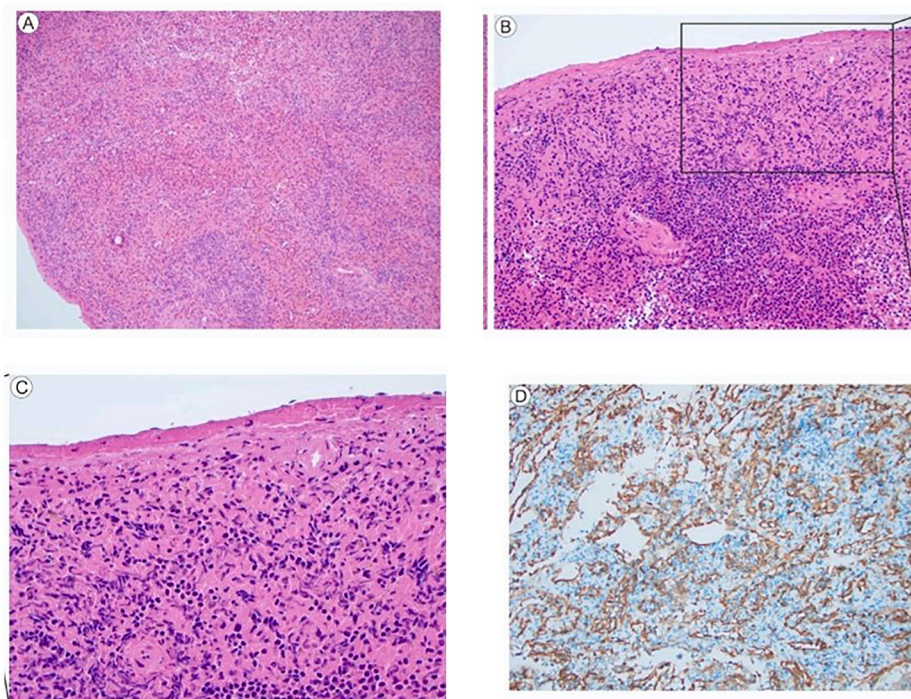


Fig. 2. A. H&E shows red pulp and inconspicuous white pulp consistent with splenosis, white pulp along with an arteriole (B) and hemosiderin and macrophage underneath the capsule suggesting prior trauma (C). D. CD8⁺ highlights sinus endothelial cells in red pulp. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

diagnosis, however, conventional imaging modalities such as ultrasound, CT, and MRI provide limited accuracy in diagnosis (as in our patient's case). Due to the limited sensitivity and specificity of conventional imaging, ectopic splenic deposits are often misdiagnosed as

metastatic disease, lymphoma, hemangiomas, peritoneal mesothelioma, granulomatous peritonitis (from disseminated tuberculosis or histoplasmosis), rupture of the tumor, or reactive adenopathy.³ In patients with history of trauma and splenectomy, and low clinical

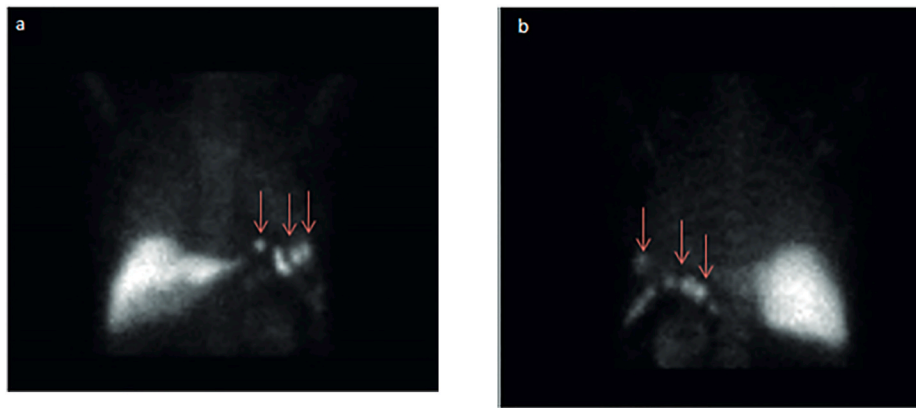


Fig. 3. Example of ^{99m}Tc -DRBC scintigraphy (planar imaging): anterior (a) and posterior (b) view demonstrating multiple foci of labeled red blood cell accumulation. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

suspicion of metastases, differentiation of ectopic splenic tissue can be achieved through nuclear imaging studies such as the (99 m)Tc heat-damaged erythrocyte study (Fig. 3) or biopsy.⁴ Damaged erythrocytes have an important role in determining splenic function, since damaged red blood cells are sequestered by the spleen. Through the process of heating, red blood cells undergo fragmentation and spherocytosis, which leads to increased stiffness, and subsequent entrapment by the spleen. This makes the (99 m) Tc heat-damaged erythrocyte study both highly sensitive and specific.⁵ Once diagnosis of splenosis is made, conservative management is typically recommended in asymptomatic patients, as the splenic tissue may be beneficial for the immune function in otherwise asplenic patient. In addition to symptomatic etiology of obstruction due to splenic deposits mentioned previously, ectopic tissue may also need to be excised in patients with history of recurrent idiopathic thrombocytopenic purpura (ITP).⁴ When found incidentally intraoperatively, care must be taken to avoid dissection to minimize the risk of rupture and hemorrhage.

Splenosis should be considered in a patient with nodules or masses in the pelvis and history of trauma. High clinical suspicion coupled with radiographic imaging such as MRI and the (99 m)Tc heat-damaged erythrocyte study may allow for accurate diagnosis without need for biopsy, preventing additional interventions. As the condition is typically benign and often confers immune protection, avoidance of unnecessary excision should be prioritized. Our case of pelvic splenosis adds to the literature, and demonstrates that ectopic implantation may be found

within posterior peritoneum during cases of radical prostatectomy.

4. Conclusion

Splenosis is a benign condition which occurs in patients with history of splenic injury and can be mistaken for metastatic disease in setting of malignancy. Our case highlights the diagnostic findings and intra-operative management of posterior peritoneal implantation of ectopic splenic tissue during prostatectomy.

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