An Atypical Hepatic Mass: Diagnosis with Heat Denatured Red Blood Cell Scintigraphy: Original Image

Bir Atipik Hepatik Kitle: Isı ile Denatüre Edilmiş Kırmızı Kan Hücre Sintigrafisi ile Tanı

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ABSTRACT Splenosis is a benign condition that frequently occurs after rupture of spleen following an abdominal trauma. We present a 28-year-old male patient who was referred to our hospital for laparoscopic cholecystectomy with a prior diagnosis of acute cholecystitis. The medical history revealed splenectomy following traumatic rupture of the spleen in 1983. The patient underwent a laparoscopic surgery for cholecystitis and a large mass lesion was detected in the liver. Although localization of the mass was thought to be atypical for splenosis, in order to rule out the possibility of splenosis, heat denatured red blood cell scintigraphy was performed. The study showed multiple focal areas of radiotracer uptake around the splenic bed and upper part of the liver parallel to the contour of the diaphragm which was consistent with the diagnosis of splenosis.

Key Words: Liver neoplasms; radionuclide imaging; splenosis

ÖZET Splenozis sıklıkla karın travmasını takip eden dalak rüptürü sonrası oluşan benin bir durumdur. Biz daha önceden akut kolesistit tanısı almış olan ve hastanemize laparoskopik kolesistektomi için gönderilen 28 yaşındaki bir erkek hastayı sunmaktayız. Hastanın tıbbi geçmişinde 1983 yılında travmatik dalak rüptürü nedeniyle splenektomi operasyonu vardı. Hastanın laparoskopik cerrahi operasyonu sırasında karaciğerde büyük bir kitle lezyonu tespit edildi. Her ne kadar kitle lokalizasyonu splenosis açısından atipik olsa da, splenozis olasılığını ekarte etmek için ısı ile denature edilmiş kırmızı kan hücre sintigrafisi yapıldı. Çalışma dalak bölgesi ve karaciğerin diyafram konturuna paralel üst kısmı düzeyinde splenozis tanısı ile uyumlu çok sayıda radyoişaretleyici (radiotracer) fokal tutulum alanlarına işaret etmekte idi.

Anahtar Kelimeler: Karaciğer tümörleri; radyonuklit görüntüleme; splenozis

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Splenosis is the autotransplantation of splenic tissues to ectopic sites. It usually occurs in patients suffering from rupture of the spleen with bits of tissue scattered in the abdomen.[1] These splenic fragments implant on the peritoneal surfaces, liver and the other structures.[2] Ectopic splenic tissue presenting with a mass lesion in the infradiaphragmatic region of liver is an extremely rare condition. In the following report a case of hepatic splenosis which is detected at time of laparoscopic cholecystectomy is reported with the emphasis of the clinical and scintigraphical findings.

CASE REPORT

A 28-year-old man complaining of dull abdominal pain was referred to our hospital. His abdominal sonographic study demonstrated stones in common

bile duct and gallbladder. The diagnosis was acute cholecystitis and the patient was hospitalized for further evaluation like; preoperative endoscopic retrograde cholangio-pancreatography and endoscopic sphincterotomy followed by laparoscopic cholecystectomy. During the cholecystectomy, a small soft tissue mass (approximately 1 cm long) and a large mass was seen over the gall bladder and in the infradiaphragmatic region of the liver, respectively through the laparoscope. The small mass lesion and the gall bladder were removed together but not the large mass lesion in the liver. The histopathological diagnosis of the removed mass was consistent with splenic tissue (Figure 1). This was intriguing because patient had the history of splenectomy after a traumatic rupture of the spleen in 1983. However the localization of the large mass lesion in liver was thought to be atypical for splenosis, and heat denatured red blood cell (RBC) scintigraphy was performed in order to rule out the possibility of the splenosis.

Patient's RBCs were labelled with Tc-99m by using modified in vitro technique and denatured by incubating at 49.5 ºC for 30 minutes and then reinjected to the patient. One hour after injection of the RBCs, planar images of abdomen were obtained with single head gamma camera (ADAC, Arguss Epic) by using LEHR collimator. The study showed multiple focal areas of radiotracer uptake around the splenic bed and upper part of the liver parallel to the contour of the diaphragm consistent with the diagnosis of splenosis (Figure 2). No further workup was performed as the patient was asymptomatic.

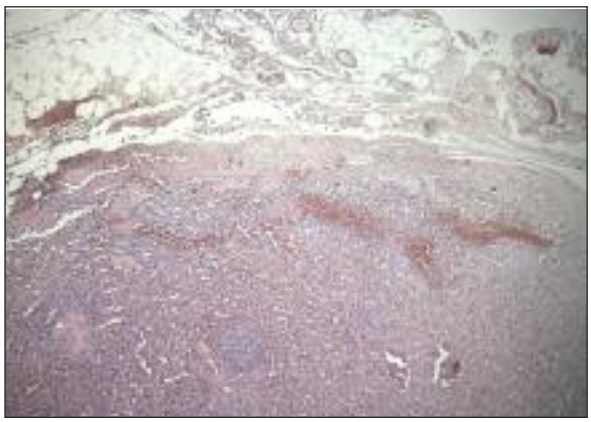

FIGURE 1: Splenic tissue surrounded by perivesical adipose tissue (HE, x40).

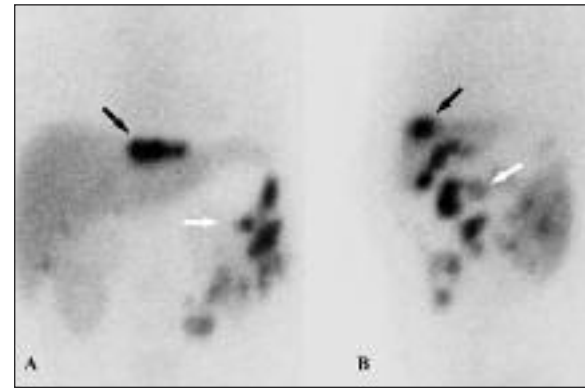

FIGURE 2: Anterior (A) and left lateral (B) images of the heat denatured red blood cell (RBC) scintigraphy demonstrate multiple focal areas of radiotracer uptake around the splenic bed (white arrow) and upper part of the liver parallel to the contour of the diaphragm (black arrow) consistent with the diagnosis of splenosis.

DISCUSSION

The term 'splenosis' was first used by Buchbinder and Lipkoff,[1] describing the heterotropic autotransplantation of splenic tissues following an abdominal injury. Patients are usually asymptomatic and splenosis is generally detected incidentally during a surgery or in some imaging studies. However, splenosis is not always innocent, because it can cause gastrointestinal hemorrhage,[3] abdominal pain,[4] or flank pain from ureter compression.[5] There is no need to remove asymptomatic implants of splenic tissue, in fact, the implants may even have an immunoprotective role. If sufficient amount of splenic tissue is available, it can be able to reduce the rate of postsplenectomy sepsis.[6] Most authors recommended a follow-up approach in patients with asymptomatic splenosis.

In the literature, the rate of splenosis after traumatic splenectomy was reported between 26% and 67%.[7] The splenic implants may be located in any region; splenic fossa, peritoneal cavity, and gastrointestinal tract being the most common sites of involvement.[2] The unexpected localization, as in our patient, may mimic a neoplasm because of the irregular shape of splenic implants.[8] Both computed tomography and magnetic resonans imaging reve-

al the number, shape and size of the lesions however they donot, identify the splenic implants and are insufficient for the differential diagnosis.[9] In addition, nonspecific radiologic findings can easily be misinterpreted as various other pathologies in hepatic and abdominal splenosis.[10,11] These include metastatic lesions, adenopathies, hepatic adenomas, hemangiomas, or lymphomas.[12] The implants of splenosis are usually multiple in number reaching up to 7 cm in size without any characteristic shape, hilus or capsule.[7] Therefore, in patients with atypical hepatic or abdominal mass lesions, a thorough medical history can suggest the diagnosis of splenosis so that inconclusive and untargeted radiological studies are precluded, even unnecessary surgery can be avoided. In these patients, nuclear scans are the mainstay method in the diagnosis of splenosis and are specific for functioning splenic tissues.[13] Tc-99m sulphur colloid (SC), Tc-99m tin colloid, Tc-99m phytate, Tc-99m autologous erythrocytes opsonized with anti-D Ig G, Tc-99m heat denatured autologous RBCs and In-111 labeled autologous platetes are the agents used for the localization of spleen as splenic tissue uptakes all of these agents.[14] However, Tc-99m SC and Tc-99m heat denatured autologous RBCs are the mostly preferred agents, Tc-99m heat denatured autologous RBCs are more sensitive than Tc-99m SC in the scintigraphic scanning of splenic tissues.[15] The denatured RBC fragments are larger than SC particles, so that functioning splenic tissue will trap 90% of the damaged erythrocytes after injection, whereas about only 10% of SC can be uptaken.[5]

In conclusion, this case report demonstrated that hepatic splenosis should be considered in the differential diagnosis of hepatic or abdominal masses in patients with a history of posttraumatic splenectomy. Additionally, Tc-99m heat denatured RBC scintigraphy is able to diagnose patients with splenosis with excellent results and it precludes unnecessary invasive diagnostic procedures such as biopsy and operations.

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