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A case of Sclerosing Angiomatoid Nodular Transformation of the Spleen : Shear wave elastosonography findings and the brief review of the literature

Dalakta Sklerozan Anjiomatoid noduler transformasyon gösteren olguya shear-wave elastografi bulguları ışığında yaklaşım ve literatüre kısa bir özet :

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ÖZ

Sklerozan anjiomatoid nodüler transformasyon (SANT) dalakta yeni tanımlanan benign özellikte lezyonlardandır.

SANT araba tekerleğine benzer şekilde tarif edilen spesifik bir radyolojik paterne sahip olup literatürde 100 den az olguda tanımlanmıştır.

17 yaşında olguda heterojen 6x5 cm boyutunda dalakta tanımlanmış olan lezyona daha önce literatürde tanımlanmayan shear-wave elastografi tekniği ile literatür ile karşılaştırarak bulgularını sunmayı amaçlıyoruz.

Anahtar Kelimeler : pediatrik, shear-wave, SANT, sonografi

ABSTRACT

Sclerosing angiomatoid nodular transformation (SANT) is the recently described benign vascular lesion of the spleen.

SANT has a specific radiologic pattern of spoke-wheel in magnetic resonance imaging (MRI), and there are less than 100 identified SANT cases in the literature.

A heterogenous solid mass with the dimensions of 6x5 cm was incidentally found in the spleen of our 17 year-old-boy patient who underwent sonography and MRI. The shear-wave elastography of SANT was not described in the literature before.

In this study we aim to present our radiological findings and give a brief review of the literature.

Key words: SANT, shear-wave, pediatric, spleen

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Introduction

The primary involvement of the spleen by the secondary disease is more common than the primary lesions of the spleen. Sclerosing angiomatoid nodular transformation of the spleen (SANT) was first described in 2004 by Martel et al[1]. It is known as one of the benign splenic lesions. SANT is primarily a vascular lesion originating from the red pulp. Corresponding to its macroscopic appearance, SANT has a specific radiologic pattern of spoke–wheel in MRI as described by Karaosmanoglu et al[2]. Due to improvement in the imaging modalities, SANT is usually recognized as the incidentaloma. SANT differs from other angiomatoid lesions by heterogeneity of the vascular components. The etiology of the SANT is still unclear, and it should be considered in the differential diagnosis of splenic mass forming lesions. There are more than 95 cases demonstrated in the literature, including the contrast enhanced sonography findings[3]. But the shear wave sonoelastography findings were not described before in the English literature. We present a case of SANT in an adolescent with radiologic findings and give a brief review of the literature.

Case Report

Our patient was seventeen years old male with a history of known ulcerative colitis. A heterogenous splenic mass which has round configuration, and vascularity was found incidentally in the routine sonography. Furthermore, a MR enterocilizis revealed a 6x5cm heterogenous solid mass with lobulated contours in the spleen. The lesion showed minimal contrast enhancement. In sonography examination the lesion was hyperechoic but there was not blood flow in the doppler study. The patient had admitted to abdominal MRI imaging for further examination. In the medial part of the spleen there was a heterogenous intensity with centrally hyperintense on precontrast fat saturated T1-weighted images. On T2-weighted images the central part was hypointense and peripherally hyperintense with the radiating areas extending to the center of the lesion which enhances after contrast administration. The progressive central progression of contrast enhancement in the late phase gives a spoke-wheel pattern and the non-enhancing part resembles the fibrosing part. Positron emission tomography demonstrated an isolated splenic lesion with homogeneous low level increased fluorodeoxyglucose (FDG) activity, with a maximum standardized uptake value (SUV) of 2.08 presenting as a benign splenic lesion. Because the patient has no symptom of pain, he is still on follow-up without surgery. After one year the shear wave elastocity values were obtained by the Siemens Acuson S2000 with 6-1 probe and 9-4 probe. The dimensions of the splenic lesion were 47x43x42mm. It was hypoechoic, round and sharp bordered. There were hyperintense linings extending from peripherally to the central part of the lesion. The doppler sonography examination did not show vascularization. Additionally, the splenic lesion showed small mass effect with Within 9-4 probe the shear wave sonography values differentiate from 0,93 to 2,25 and the mean value was measured as 1.47±0.13 (SD) m/s. The image quality assessment was high that obtained by the shear wave elastocity map.

Seventeen years old boy incidentally found splenic lesion in magnetic resonance imaging. The lesion diameter was 6x5cm in the MRI imaging. After one year the shear wave sonography was obtained by Siemens Acuson S 2000 (ARFI) with 9-4 L probe. The lesion dimensions were 47x43x42 mm which showed small decrease in the size.

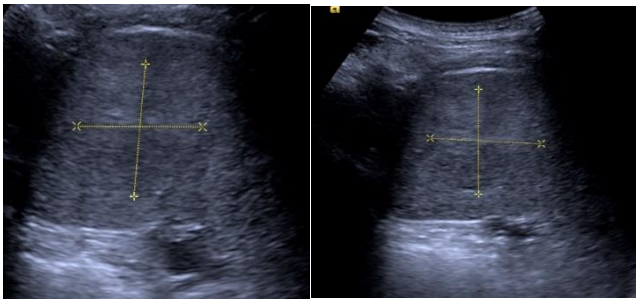

Figure 1a and 1b shows the B-mode sonography examination of the lesion. The lesion has a round nodular configuration, hypoechoic halo sign in the lower lobe of the spleen. The lesion is hypoechoic generally but hyperintense small septations extending from peripherally towards to the center of the lesion which could correspondence to the 'spoke-wheel' pattern of the splenic angiomatoid noduler transformation lesion of the spleen.

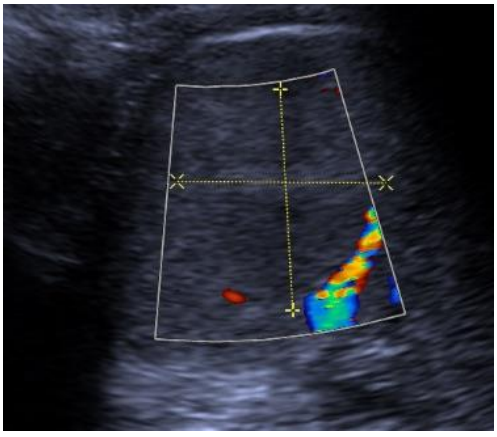

Figure 1c shows the doppler examination of the seventeen years old boy with SANT lesion. There is not any color spectrum representing vascularization in the lesion. The vascular structures of the intraparencymal in the spleen was slightly depressed to laterally.

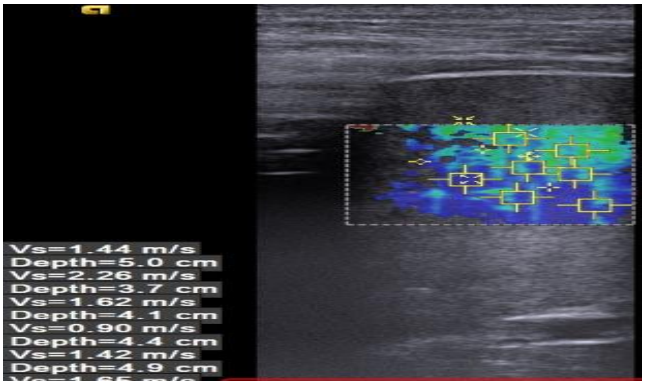

Figure 1d shows the ARFI results of the splenic lesion.

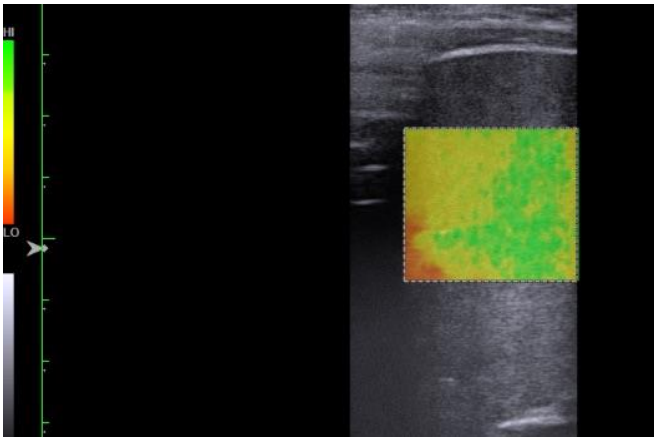

Figure 1e demonstrates the quality map of the shear wave elastography of the lesion.

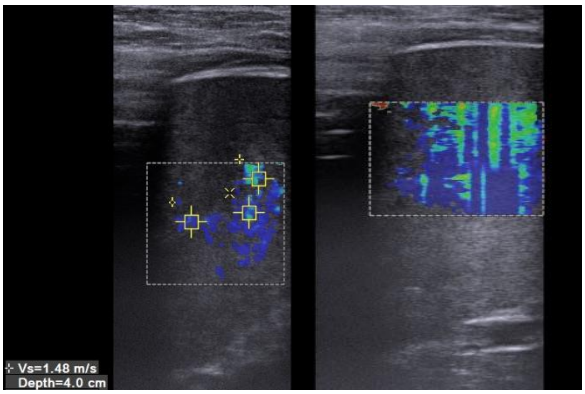

Figure 1f and 1g shows the additional findings of the shear wave sonography of the lesion.

Discussion

The primary lesions of the spleen are very rare compared to systemic involvement of the diseases. Except the lymphomas the most common tumors of the spleen are the vascular origin such as hemangioma, hemangioendothelioma or the angioma. SANT is newly described by Martel et

al as a benign vascular disorder of the spleen[1]. The incidence of SANT in women is twice as common as in men within a mean age of 48 years. There is a wide range of lesion dimensions changing from 3cm to 17cm in diameter[4]. The lesions are found incidentally like our case. However, the most common way of the presentation in the patients is the abdominal pain or hematologic abnormalities[2,3].

In our case, there was progressive centripedal enhancement with a radiating pattern which is described by Karaosman et al specific pattern for the SANT in the MR[2]. Regarding the radial pattern the center remains hypointense on the late phase images of MRI while there is peripherally enhancement occurs. This contrast pattern is also well known as the spoke-wheel pattern. Histologically SANT is composed of multiple angiomatoid nodules separated by fibrous tissue bands in order to form a fibrous stellate central scar. [15–7] This central scar may correspond to the late phase peripherally enhancing fibrous tissues.

On DWI images the lesions were not accurately as diagnosed like the contrast enhanced studies. There was a heterogenous and hypointense appearance and increased diffusion on ADC images. The specific spoke–wheel pattern was not occurred on DWI. On the behalf, Yoshimouto et al demonstrated the superior role of DWI on the contrast enhanced series[8]. On T2-Fat saturated weighted images the lesion was hyperintense and the central hypointense areas with radiations towards the center of the lesion. Lewis[9] et al demonstrated this hypointense areas were the hemosiderin deposits which is mainly occurred between the angiomatoid nodular lesions. The chemical shift imaging shows the hemosiderin deposition better on in phase imaging compared with the opposed phase. However, this differentiation is not clear in our case. This diffraction and the hemosiderin deposition areas are clearer on diffusion weighted images than in phase and opposite phase images. Diffusion weighted series are more sensitive to susceptibility effect compared to other series of which the effect leads a considerable signal drop in the angiomatoid nodular areas.

Shear wave elastography is a new promising technic to diagnose the stiffness of the spleen which is a major complication of hepatic fibrosis. Shear wave sonography in spleen has more critical role because of it is very difficult to do a biopsy from the parenchyma.

The mean splenic shear wave velocities were found 2.17 m/s with 4C1 probe and 2.15 m/s with the 9L4 probe in healthy volunteers in the late adolescent age group. The shear wave elastography properties of the splenic lesions including benign and malign disorders were not demonstrated. The splenic values of ARFI (aquasition radiation force impulse) SANT was lower than the normal healthy volunteers. This lower value compromises the slightly solid nature of the SANT compared to the spleen parenchyma. Additionally, the doppler sonography did not show vascularization towards to the center of the lesion.

In conclusion the shear wave elastography of sclerosing angiomatoid nodular transformation of the spleen was not described before. The shear wave elastography values shows that the nature of the SANT is more solid than the splenic

parenchyma. This case presentation will enlighten to understand the nature of the splenic lesion and have to be corrected with large cohort groups.

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