

Sonographic evaluation of accessory spleen

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SUMMARY

Objective: Accessory spleens (AS) usually appear on routine abdominal ultrasonography (US) and frequently not investigated. The aim of this study is to research the prevalence, imaging features and related conditions of AS.

Materials and Methods: This study is based on 190 patients that applied to US department with various clinical symptoms in 18 months period. Patient ages, gender; although AS counts, location, shape, dimension and probable accompanied splenomegaly researched on B-mode US.

Results: Majority of AS had a dimension between 10-15 mm. Usually they are round shaped and localized at splenic hilus. They mostly visualized in female with the mean age 32.9 (SD: 19.2). There was no statistically difference between splenomegaly and dimension of AS. Positive significant correlation was found between not only age and dimension ($p<0.05$, $r=0.305$), but also gender and splenomegaly ($p<0.05$), dimension and shape ($p<0.05$).

Conclusion: Sonographic features of AS are investigated. This report reveals sonographic findings of AS, that may be used on differential diagnosis of splenic pathologies.

Key words: Spleen, Splenomegaly, ultrasonography, Accessory

ÖZET

Aksesuar dalağın ultrasonografik değerlendirilmesi

Amaç: Aksesuar dalak (AS) genellikle batin ultrasonografisi sırasında saptanıp, yeteri kadar inceleme yapılmamaktadır. Bu çalışmanın amacı aksesuar dalağın sıklığını, görüntüleme özelliklerini saptamaktır.

Materyal ve Metod: Bu çalışma 18 aylık bir dönemde çeşitli klinik bulgularla Ultrasonografi bölümüne başvuran 190 hasta üzerinde yapıldı. Hastalar yaş, cinsiyet, aksesuar dalak sayısı, lokalizasyon, şekil, boyut ve olası eşlik ettiği splenomegali durumu B-mode ultrasonografide değerlendirildi.

Bulgular: Aksesuar dalakların çoğunluğu 10-15 mm arasında bir boyuta sahip, yuvarlak şekilli, hilusa daha sık yerleşim göstermiş ve kadınlarda erkeklere göre daha sık ve ortalama yaş 32.9 (SD 19.2) olarak tespit edildi. İstatiksel olarak splenomegali ve aksesuar dalak boyutu arasında anlamlı manalılık saptanmadı. Pozitif anlamlı korelasyona rağmen sadece yaş ve boyut arasında ($p<0.05$, $r=0.305$) ve bundan başka cinsiyet, splenomegali, boyut ve şekil açısından da anlamlı manalılık saptanmadı ($p<0.05$).

Sonuç: Bu çalışmamızda aksesuar dalağın ultrasonografik bulguları incelendi. Bizim düşüncemize göre, bu çalışmamız, aksesuar dalağın anlamlı ultrasonografik bulgularını saptadı ve bulgular dalak patolojilerinin teşhisinde güncel bilgi olarak gözönünde bulundurulabilir.

Anahtar kelimeler: Dalak, splenomegali, ultrasonografi, aksesuar

Accessory spleens are well margined, round or oval shaped, solitary lesions that border from regional fatty tissue regularly. They have similar echogenities according to spleen on sonography, therefore they can be found on transabdominal US easily. They consist of the fusion defect of main spleen. Previously AS are documented by radionuclide scanning. Developing techniques on US; such

as tissue harmonic mode, reveal to achieve the correct diagnosis alone⁽¹⁾. Unconsidered imaging may lead to confuse solid masses or lymphadenopathies on diagnosis. Haematologic diseases may require splenectomy. This situation also require excision of AS; therefore detailed sonography is indispensable. US is the primary imaging method and has an importance on diagnosis^(1,2).

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MATERIALS and METHODS

190 patients with 211 AS were examined on abdominal US imaging during 18 months period. Stomach ache, gastric spasm, nausea, vomiting, indigestion, renal colic, urinary disease were the main clinical disorders and we also investigated routine check-up scans. None of them had any trauma or surgery anamnesis. In one patient, we could not differentiate AS from a metastatic lymphadenopathy, therefore patient underwent MRI. All AS were round or oval shaped and had variable dimensions. Localizations were classified into 5 group. We divide the main organ on coronary slices in abdominal tissue harmonic mode US. Divisions were as follows: (1) superior, (2) superomedial, (3) hilus, (4) inferomedial, (5) inferior localizations. All patients researched for accompanied splenomegaly. All AS were researched on shape (round or oval), dimension (long diameter) and localization. We also investigated age, gender and AS counts per patient. Dimensions were divided into 6 groups: (a) 0.1-5 mm, (b) 5.1-10 mm, (c) 10.1-15 mm, (d) 15.1-20 mm, (e) 20.1-25 mm and (f) 25.1 mm-more. Lobulations of main spleen were excluded. Also in 1 patient we imagined a hypertrophic AS without main organ. The patient had a splenectomy anamnesis after a traffic accident. We also used Doppler US to research vascular supplies from splenic arterial or venous branch. On suspicion of malignancy, we performed control sonograms and advanced imaging techniques such

as Computed Tomography (CT) and/or Magnetic Resonance Imaging (MRI).

RESULTS

Study group consisted of 80 males (42.1 %) and 110 females (57.9 %), totally 190 patients. Patients were between 1-year-old and 89-year-old. Infants were totally 14 cases (7.4 %). Mean age was 32.9 (SD:19.2). AS diameters were mostly between 10.1-15 mm. 211 AS grouped per diameter: (a) 8 AS (3.8 %), (b) 71 AS (33.6 %), (c) 73 AS (34.6 %), (d) 43 AS (20.4 %), (e) 14 AS (6.6 %), (f) 2 AS (0.9 %). It was found that 156 AS had round shape (73.9 %), and 55 were oval (26.1 %). The patient that underwent MRI had a round shape AS. MRI revealed similar signal intensity and contrast enhanced pattern according to the main organ. Abdominal MRI did not reveal any lymphadenopathies in abdomen; therefore AS had diagnosed. 22.4 % of round shaped and 10.9 % of oval shaped were existent with splenomegaly. AS were mostly seen in hilus localization. The localizations were as follows: (1) 1 AS (0.5 %), age 26.0; (2) 4 AS (1.9 %), mean age 35.7; (3) 124 AS (58.8 %), mean age 30.0; (4) 53 AS (25.1 %) mean age 27.3; (5) 29 AS (13.7 %), mean age 31.3. 41 AS (19.4 %) showed existence splenomegaly. Chi-square test had not revealed any statistically expressivity between splenomegaly and dimension or shape of AS. Positive significant correlation was found between not only age and dimension ($p<0.05$, $r=0.305$), but



Figure 1. Abdominal US of spleen. Classification of localizations on longitudinal sonogram.



Figure 2. Longitudinal sonography of splenic region. Round accessory spleens are seen isoechogen according to the main spleen in hilus localization.

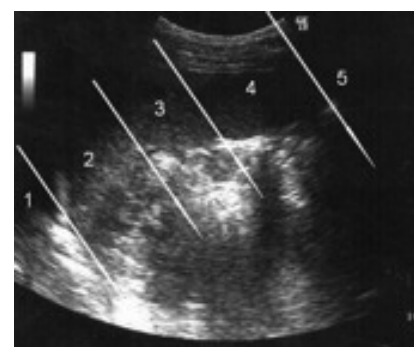


Figure 3. Longitudinal sonogram. Demonstrating of drainage vessels of accessory spleens.

also between gender and splenomegaly ($p < 0.05$), dimension and shape ($p < 0.05$). On t test, there were not any statistically correlations between gender-diameter, gender-shape and gender-localization. Although there was a significant correlation between age and diameter on Pearson test ($p < 0.05$, $r = 0.305$). Comparison of gender and splenomegaly revealed existence in 28 % of male group and 12.7 % female group ($p < 0.05$). Diameter and shape had statistically togetherness ($p < 0.05$). Increase of diameter showed oval shape on AS.

DISCUSSION

Ectopic spleens are single or more solitary lesions that consisted congenital (AS) or traumatic auto-transplantation (splenosis). AS mostly localize in splenic hilus. Pancreas, omentum major or minor, mesentery, thorax, gastric fundus and scrotum localizations are also reported. AS reveal similar echogenicity on US examination according to spleen. Spleen is the main organ that may be affected in many pathologic conditions, therefore AS tissue may also be affected. Spontaneous rupture of spleen is uncommon and mostly occurs after trauma. Rupture of AS has seen more frequently and caused by minor traumas. Major traumas such as a traffic accident may cause rupture of spleen and/or AS. Torsion of AS is very rare and appears nonvascular mass with abdominal pain (1,3-5).

Echogenicity of AS on sonography is similar to spleen. AS may confused with enlarged lymphadenopathy, pancreatic carcinoma, insulinoma, island cell tumor, adrenal tumor or gastric leiomyoma. Advanced imaging techniques have to apply in suspicion. Immune thrombocytopenic purpura, chronic lymphocytic leukemia with increased thrombocytopenia; hereditary spherocytosis and autoimmune hemolytic anemia are the main diseases that may involve spleen, therefore it is necessary to investigate AS before therapy. Splenectomy is the treatment of these diseases and AS tissues have to be removed on surgery. Functional residual splenic tissue may cause relapse (3-6).

Torsion, rupture, hemorrhage and cyst formation are the main complications of AS. Similar appearance of lymphadenopathy or tumor lesion of adjacent organs leads to confuse diagnosis, therefore defining of AS has an importance. Remove of all splenic tissue on surgery is necessary. Splenic clefts, lobulations, polysplenia and splenosis have to be distinguished from AS. AS have characteristic aspect on sonography. They can be visualized as well marginated, oval or round masses that are smaller than 2 cm. Tissue harmonic mode may have better demonstrating features. Imaging of arterial or venous drainage vessels are also useful methods on diagnosis. This study reveals that AS smaller than 1 cm visualize minimal hypoechogen, although with the aid of tissue harmonic imaging demonstrate isoechogenicity on US (1,4,5).

Sonographic features of AS may mimic metastatic lesions, lymphadenopathy and malignancy of pancreas, adrenal gland and kidney. CT and MRI are the advanced imaging techniques. They all reveal similar contrast enhancement pattern according to the main organ spleen before and after intravenous contrast material administration. AS smaller than 1cm may be affected from partial volume effects. Their attenuation may show hypodensity or hypointensity. Imaging of drainage vessels is also important method on diagnosis.

Splenic hilus is the main localization of AS (2-4). Subramanyam et al, revealed that multiple AS occur in a single location. In our study 6 of 17 patients had multiple AS and showed different localizations (1). AS were found solitary in 173 (91 %) of all study group. 13 AS (6,8 %) had two locations and 4 (2,1 %) had three or more. Only one patient had superior splenic adjacent localization. This localization is not seen frequently. This situation may depend on difficulty of imaging the superior area. AS have to be distinguished from enlarged lymph nodes. AS show similar sonoechogenicity, CT density and MR signals according to spleen. In suspicion, patients should direct to advance imaging techniques. Spleen has high

blood contents in the body, therefore parenchyma may have similar appearance with malign tissues. CT and MRI show heterogeneous parenchyma in arterial phase, although delayed phases have to show homogeneity⁽⁴⁾. AS have splenic tissues, therefore they may show similar features on imaging techniques. CT is the second imaging method on diagnosis. In one of our patient, we performed contrast enhanced MRI as a primary method. Our case had malignancy suspicion on pancreatic head zone, therefore we proved the diagnosis with dynamic MRI studies⁽³⁾.

In conclusion, abdominal US is a sensitive and primary imaging technique to identify AS. Many diseases require sonography follow-up, before and after treatment. Diameter, shape and localizations are necessary in the diagnosis. These defined features may help us to differentiate AS from perisplenic masses. AS have splenic tissues, therefore may affect the treatment. Imaging methods are helpful on treatment choices.

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