

Accuracy of gray-scale and color Doppler sonography in diagnosis of hepatic hemangioma, hepatocellular carcinoma and liver metastasis

Hashemi, J.^a, Esmaeilzadeh, A.^b, Dabbagh Kakhki, V.R.^c, Hosseini, M.R.^a

^a Department of Radiology, Imam Reza Hospital, **Mashhad University of Medical Sciences**, Ebne Sina St., **Mashhad**, Iran

^b Department of Gastroenterology, Imam Reza Hospital, **Mashhad University of Medical Sciences**, Ebne Sina St., **Mashhad**, Iran

^c Department of Nuclear Medicine, Imam Reza Hospital, **Mashhad University of Medical Sciences**, Ebne Sina St., **Mashhad**, Iran

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Abstract

Background/Objective: Distinguishing cavernous hemangioma from malignant neoplasms represents a diagnostic challenge. Knowledge of the entire spectrum of gray-scale ultrasonography (US) and color Doppler appearances of these tumors is important. The objective of this study was to determine the diagnostic accuracy of gray-scale US and color Doppler appearances of liver tumors. **Patients and Methods:** 111 patients with 127 focal hepatic lesions were prospectively studied with gray-scale and color Doppler US. The final diagnoses of the liver lesions as confirmed by pathology or ^{99m}Tc-red blood cell scintigraphy were 41 hemangiomas, 10 hepatocellular carcinomas (HCCs) and 76 metastases. **Results:** 87.8% of hemangiomas and 76.7% of HCCs were hyperechoic, while 94.1% of metastases were hypoechoic. In lesions < 2 cm in diameter, the sensitivity and specificity of the hyperechoic pattern for differentiation of hemangioma from metastasis and HCC were 94.1% and 80.0%, respectively. They were higher than the lesions with a diameter ≥ 2 cm (83.2% and 49.9%, respectively, both P=0.001). Posterior acoustic enhancement was seen in 98% of hemangiomas (P<0.001), as compared to 24.4% in metastases and 13.2% in HCCs. 10 hemangiomas had an echogenic rim. The peripheral hypoechoic rim, named as the target sign, was seen in 37.8% of metastases, 26.7% of HCCs and 1.4% of hemangiomas (P<0.001). Most hemangiomas (80.4%) showed no lesional blood flow, while most HCCs (80%) had both intra- and peri-lesional vascularity (P<0.001). There was intratumoral blood flow in 86.7% of HCCs. Lesional flow, whether intratumoral or peritumoral or both, was seen in all 14 patients with HCC while absence of the lesional flow was not noted in any of the HCCs. **Conclusion:** Most hemangiomas had no detectable blood flow in color Doppler US. Almost all HCCs had intra- and/or peri-tumoral vascularity in color Doppler sonography, so the probability of hepatocellular carcinoma is low in a hepatic mass without intra- or peri-lesional vascular blood flow. So these findings together with morphological criteria may help narrow down the differential diagnosis in certain clinical conditions.

Reaxys Database Information

Author keywords

Doppler ultrasound; Hemangioma; Hepatocellular carcinoma; Liver; Metastasis

Indexed Keywords

EMTREE drug terms: technetium ^{99m}

EMTREE medical terms: adult; aged; article; cancer size; cell labeling; clinical trial; color ultrasound flowmetry; contrast enhancement; controlled clinical trial; controlled study; diagnostic accuracy; differential diagnosis; erythrocyte; female; Gray scale echography; human; image display; liver blood flow; liver cell carcinoma; liver hemangioma; liver metastasis; major clinical study; male; prospective study; sensitivity and specificity; single photon emission computer tomography; tumor blood flow; tumor vascularization