PERIPHERAL PUDDLING OF CONTRAST-CLASSICAL ENHANCEMENT PATTERN OF GIANT CAVERNOUS HEPATIC HEMANGIOMA REVEALED ON COMPUTED TOMOGRAPHY IN AN ADULT MALE

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INTRODUCTION

Giant cavernous hemangiomas (GVH) of the liver with clinical manifestations are rare. Edmondson et al described giant hemangiomas as tumors more than 10 cm in greatest dimension [1]. Familiarity with the characteristics of the internal architecture of giant cavernous hemangiomas on dynamic bolus CT is useful in making the specific diagnosis of this tumor [2]. Giant hepatic cavernous hemangiomas are clinically distinct from smaller asymptomatic ones and may be confused with primary or metastatic malignancy. On unenhanced CT scan of the giant hemangiomas, these masses are usually less dense than surrounding normal liver. All masses contain additional stellate or cleftlike low-density zones, hyperdense regions and /or calcification. After bolus intravenous contrast administration, all GVH exhibit early peripheral enhancement and partial centripetal isodense fill-in. Familiarity with these CT characteristics and a high index of suspicion should facilitate correct diagnosis and avert needle biopsy [3].

CASE REPORT

A forty two years old male was admitted with three months history of vague right upper quadrant abdominal pain, together with nausea and early satiety. He didn't complain of weight loss or jaundice. On abdominal examination, there was a palpable mass in the right upper quadrant. His laboratory investigations including serum aminotransferase, serum alkaline phosphatase, and serum alpha fetoprotein and blood platelet count were within normal limits. The sonographic examination of the liver revealed a large echogenic mass. Computed tomographic scan (CT scan) of the abdomen revealed a very large solitary isodense mass in the right and left lobes of the liver (fig. 1). The mass was superficially placed in the liver abutting the antero-lateral wall of the abdomen. The mass measured 10x8 x 8 cm. It revealed a curvilinear hyperdense area in the centre with hypodense portion as well. Arterial phase of contrast enhanced CT scan demonstrated the location and margins of the mass clearly. It was occupying left supero-medial and infero-medial quadrants of the left lobe of the liver (segments 4a and 4b) as well as right supero-anterior and infero-anterior quadrants (segments 8 and 5 respectively). The mass was compressing the porta hepatis, gall bladder, inferior vena cava and the head of the pancreas. Peripheral enhancement of the mass was seen caused by the puddling of contrast in dilated, ectatic vascular spaces within the tumor that was iso-attenuating with the aorta (figure 2). Based on above mentioned findings a diagnosis of giant cavernous hepatic hemangioma was made. The patient was referred to Nishtar Hospital Multan where resection of the tumor was performed. Biopsy of the pathological specimen revealed cavernous hemangioma with ectatic vascular spaces and fibrous septa thus confirming our CT scan based diagnosis. Patient was discharged symptom free on 10th post-operative day.

DISCUSSION

Giant Hepatic cavernous hemangiomas are rare benign hepatic tumors, and occur

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with a strong female prevalence [4]. They are vascular malformations that consist of blood filled channels lined by endothelium and separated by fibrous septa. Calcification may occur in larger lesions. These lesions tend to be stable, though they may enlarge during pregnancy or with estrogen administration. Although these lesions are usually asymptomatic, abdominal pain or nausea may arise through mass effect. Hemorrhage and thrombosis are occasional complications. Co-existence of platelet sequestration and Giant Hepatic cavernous hemangiomas is seen in Kassabach-Merritt syndrome [5]. Usually, they occur as solitary lesions. However, they may be multiple in 50% of patients. No lobar predilection exists. They may be associated with focal nodular hyperplasia. The natural history of liver hemangioma is not completely understood. Hemangiomas are probably congenital in origin. Hereditary factors may play a role in the pathogenesis of some familial forms. Although the growth of hemangioma is reported in the literature, ectasia is believed to contribute to lesion enlargement [6]. Giant cavernous hemangiomas may contain areas of hemorrhage, thrombosis, extensive hyalinization, fibrosis and calcifications. These features result in heterogeneity in the CT appearance of the mass [7].

Giant hepatic cavernous hemangiomas may be associated with spontaneous subacute intratumoral hemorrhage [8].

On ultrasound, the most common appearance of hemangioma is that of a well-delineated hyperechoic mass with faint acoustic enhancement.

On computed tomography, the pattern of centripetal nodular enhancement with progressive filling as well as isoattenuation with the blood vessels on unenhanced and contrast-enhanced images is particular to hemangioma as was seen in our case .

The fluid-fluid level may be seen in cavernous hemangioma due to the separation of blood cells and serous fluid as there is an

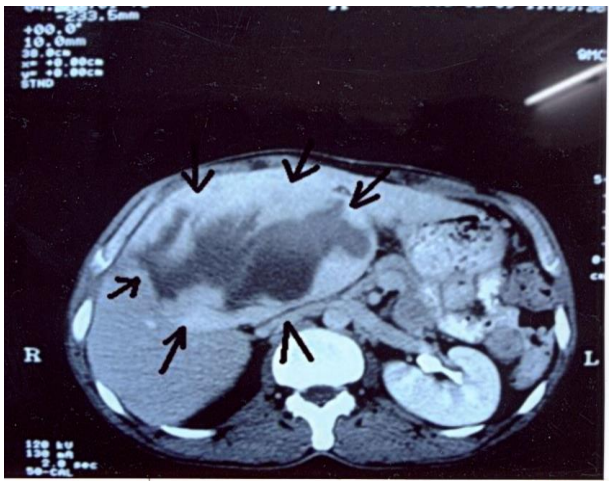

Fig. 1: Plain computed tomographic (CT) scan of the abdomen reveals a very large isodense mass lesion of the liver (arrows).Curvilinear hyperdense lesion (arrowhead) as well as hypodense central scar(S) is also seen.

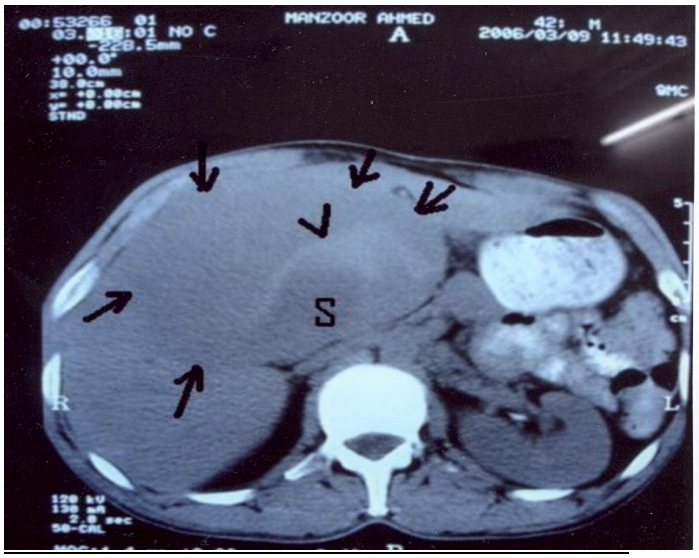

Fig. 2: Contrast Enhanced computed tomography (CT) scan taken at the same level as figure 1 shows peripheral puddling of contrast (arrows) circumferentially along the peripheral portion of the tumor. Notice compression of IVC (arrowhead).

extremely slow flow of blood in cavernous hemangioma of the liver [9]. The tumor size is a significant risk factor for hepatectomy mainly because of the massive intraoperative blood loss and blood transfusion associated with major hepatic resection [10].

Nuclear Medicine has an important role in confirmation of diagnosis of liver hemangioma. Tc-99m labeled RBC scan is not only highly sensitive and specific

investigation but is also simple, non-invasive and cost effective for diagnosing cavernous hemangioma. Early phase imaging reveals a focal photopenic defect, which fills in centripetally with delayed imaging over a 30 to 50 minutes time interval [11].

MR imaging has better sensitivity and specificity for diagnosing hemangioma. On T2 weighing, hemangiomas have higher signal intensity. On T1 weighing, enhancement after gadolinium administration is seen [4].

CONCLUSION

Giant cavernous hemangiomas have characteristic CT features as was seen in our case report. These lesions should be diagnosed on CT with care as to avert needle biopsy. We conclude that careful evaluation of the internal architecture of giant hemangiomas with dynamic bolus CT makes it possible to facilitate the correct diagnosis in these tumors.

REFERENCES

1. Edmondson HA, Peters RL. Neoplasms of the liver. In: Schiff L, Schiff ET, editors. *Diseases of the liver*. Philadelphia: Lippincott; 1982. p. 1144-5.
2. Choi BI, Han MC, Park JH, Kim SH, Han MH, Kim CW. Giant cavernous hemangioma of the liver: CT and MR imaging in 10 cases. *AJR Am J Roentgenol* 1989; 152(6): 1221-6.
3. Scatarige J, Kenny JM, Fishman EK, Herlong FH, Siegelman SS. CT of giant cavernous hemangioma. *AJR Am J Roentgenol* 1987; 149(1): 83-5.
4. Patricia J, Pablo R. Benign lesions of the liver. R*adiol Clinics North Am* 1998; 36(2): 325-7.
5. Cui Y, Zhou L, Dong MK, Wang P, Ji M, Li XO, et al. Ultrasonography guided percutaneous radiofrequency ablation for hepatic cavernous hemangioma. *World J Gastroenterol* 2003; 9(9): 2132-4.
6. Shimoji K, Shiraishi R, Kuwatsuru A, Machara T, Matsumoto T, Kurosaki Y. Spontaneous subacute intratumoral hemorrhage of hepatic cavernous hemangioma. *Abdom Imaging* 2004; 29(4): 443-5.
7. Seitz K, Mauch M, Vasilakis D, Willemsen F. Giant hemangioma of the liver - clinical and diagnostic problems - a case report. *Ultraschall Med* 2003; 24(6): 413-7.
8. Blachar A, Federle MP, Ferris JV, Lacomis JM, Waltz JS, Armfield DR, et al. Radiologists Performance in the Diagnosis of Liver Tumors with Central Scars by Using Specific CT Criteria. *Radiology* 2002; 223: 532-9.
9. Obata S, Matsunaga N, Hayashi K, Ohtsubo M, Morikawa T, Takahara O. Fluid-fluid levels in giant cavernous hemangioma of the liver: CT and MRI demonstration. *Abdom Imaging*. 1998; 23(6): 600-2.
10. Hanazaki K, Kajikawa S, Matsushita A, Monmat T, Hiraguri M, Koide N, et al. Giant cavernous hemangioma of the liver: is tumor size a risk factor for hepatectomy. *J Hepatobiliary Pancreat Surg* 1999; 6(4): 410-3.
11. Saeed A. Role of Nuclear Medicine in diagnosis of Liver Hemangioma. *J Coll Physicians Surg Pak* Mar 1999; 9(3): 151-3.