Coexisting Hepatic Hemangioma Treated Incidentally with Percutaneous Ethanol Injection and Transarterial Chemoembolization in a case of Hepatocellular Carcinoma

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Hepatic hemangiomas are not routinely treated except for large symptomatic lesions. Transarterial chemo-embolization (TACE) and percutaneous ethanol injection (PEI) are often used to treat hepatocellular carcinoma (HCC). We report a patient with underlying HCC and a coexisting small hemangioma that was inadvertently treated with both PEI and TACE because of misdiagnosis as an additional HCC. The hemangioma persisted with no visible imaging changes, nor complications. It is important to identify hemangiomas in HCC patients to avoid unnecessary treatment.

CASE REPORT

A 63-year-old female patient was diagnosed with hepatocellular carcinoma (HCC), on a background of hepatitis C related liver cirrhosis (Childs A). Her past history includes hyperthyroidism treated with thyroidectomy, and pelvic inflammatory disease. Screening sonography revealed a 1.5cm nodular lesion in the left hepatic lobe (segment 2, S2). The tumor was then confirmed by CT scan. The tumor received biopsy and histological examination, which was proved to be a well-differentiated hepatocellular carcinoma (HCC), and PEI was performed.
A total of 12 mL pure ethanol over four sessions was injected under ultrasound guidance.

Follow up sonography revealed a previously undetected hypoechoic tumor (1.2 cm in diameter) in S2 in addition to the treated tumor in the same segment, and this tumor enhanced strongly in post-contrast CT images (Fig. 1a). PEI was then arranged for the treatment of this second S2 tumor, at that time thought to be a recurrent HCC. It was injected with a total of 11 ml of pure ethanol under ultrasound guidance over four sessions. Patient remained well during and after the PEI treatments.

Follow up CT after PEI showed post-PEI changes with hypodensity covering the entire nodule and its surrounding liver parenchyma in the pre- and postcontrast images, which is compatible with post-PEI changes (Fig. 1b). However, the lesion still enhanced well in post-contrast CT images (Fig. 1b), which indicated tumor viability. In addition, new hypoechoic hepatic tumors (0.6 cm and 1.1 cm) were also found in right anterior superior segment (S8). TACE was ordered to treat what was thought to be a viable tumor in S2 and the newly detected S8 lesions.

TACE was performed via the proper hepatic artery. A total of 20 mg of doxorubicin, 6 mg of mitomycin, and 5 mL of lipiodol was injected. Small pieces of Gelfoam sponge was also injected until stasis of the feeding arteries. The patient remained stable throughout and after the procedure. Non-contrast CT after the TACE showed heterogeneous lipiodol uptake by the S2 tumor (Fig. 2). Her liver cirrhosis remained Childs A at that stage. Three months later, the follow-up triphasic CT showed that the S2 tumor still remained, and lipiodol retention was no longer present. In addition, it was noted that its enhancement was gradual, diffuse, persistent and without portovenous washout. These are atypical imaging features for HCC and hence an alternative diagnosis of hemangioma was considered. MRI revealed that the tumor was very bright in T2W images (Fig. 3a), that it was hypointense in T1W images (Fig. 3b), and that it displayed gradual enhancement as well as progressive contrast pooling (Fig. 3c) in delayed images. These are classic MR characteristics of hemangioma and the diagnosis was made. No further treatment was ordered for it.

The patient underwent follow-up dynamic CT or MR imaging at three-monthly intervals for one and a half years thereafter, during which viable and recurrent HCCs were discovered and further TACE were required. Two of her TACE included the left lobe and thereby inadvertently treated the then known hemangioma. Subsequent images reveal no permanent change of the hemangioma’s radiographic appearance, although temporary lipiodol retention was noted at the follow up CTs after each TACE (Fig. 4). The small hemangioma remained the same after a total of three sessions TACE and one course of PEI.

DISCUSSION

Typical radiographic features of hepatic hemangiomas include hypo-attenuating lesions that enhance uniformly (if small) or centripetally (if large) in the arterial phase, and retain
the enhancement in the portal venous phase [6]. Radiographic diagnosis of hemangioma does not usually constitute a challenge for a qualified radiologist. However confusion with small or well-differentiated HCC can occur [7, 8], especially if the hemangioma has other atypical imaging features such as hypoechogeneity. Hemangiomas are typically hyperechoic, however they can appear hypoechoic in patients with hepatic steatosis. Hemangiomas can also become at least partially hypoechoic as they become larger and undergo internal hemorrhage, thrombosis, or myxomatous change [9, 10], and according to some authors approximately 20-40% of hemangiomas have hypoechoic components [10, 11]. This confusion happened in our case, and the small hemangioma was not identified by the first

Figure 2. Non-contrast CT after TACE showed the retention of lipiodol within the nodule (arrow).

Figure 3. a. The nodule has very high signal intensity in T2W (turbo spin echo, TR 2000, TE 100) MR imaging, which is highly suggestive of a hemangioma. b. Precontrast T1 weighted image (gradient echo, TR 220, TE 1.5), the nodule is hypointense. c. Delayed phase images (gradient echo, TR 241, TE 2.8, acquired approximately five minutes after contrast injection) show contrast pooling, which confirms the nodule to be a hemangioma.
Hemangioma treated with TACE & PEIT

CT. It was then detected as a hypoechoic tumor by sonography and presented as a hypervascular tumor in the second CT and this lead to its misdiagnosis as HCC. In contrast to CT, MRI is both more sensitive (up to 100%) and specific (up to 92%) for hepatic hemangiomas and can be relied on to differentiate hemangiomas from other lesions, especially when heavily T2 weighted sequences are deployed [12]. Uncommonly, HCCs can display bright T2 weighted signals suggestive of a hemangioma [13], in which case other characteristics such as enhancement pattern has to be relied on in its differentiation from hemangioma. MRI confirmed this patient’s hepatic hemangioma, with the lesion displaying typical MRI characteristics of hemangiomatous lesion.

Hepatic hemangiomas are not routinely treated except for large symptomatic lesions. Common treatment options include surgery [1], transarterial embolization and radiofrequency ablation [4, 5]. Surgical removal of the hemangioma usually involves enucleation if the lesion is small; or segmentectomy if the lesion is relatively large. If the hemangioma is massive or diffuse in nature, then TAE is the preferred option. Embolic agents include polyvinyl ethanol, absolute alcohol, lipiodol, Gelatin sponge or steel coil [2, 3].

Both TACE and PEI are well-established treatment modalities for HCCs, and combination therapy with both have been shown to be more effective than PEI or TACE monotherapy for patients with HCC who are poor surgical candidates [14]. Although pure ethanol injection has been used to treat hemangioma in other anatomical locations, currently there is no clear documentation of attempts to treat hemangioma in liver with pure ethanol injection or TACE. Although many radiologists have found TAE to be adequate treatment for hepatic hemangiomas, some have found otherwise [3]. Given that hemangiomas have been treated with some degrees of success with TAE [15], we would expect this patient’s hemangioma to show some degree of susceptibility to TACE, even if it is resistant to PEI. Therefore it was indeed a little surprising that this patient’s hemangioma seemed to have survived both treatment modalities unscathed, exhibiting only transient changes in its imaging characteristics. After the PEI there was significant amount of low-density liver parenchyma surrounding the hemangioma, indicating a good amount of pure ethanol was administered into and around the lesion. It did retain significant amount of lipiodol after the TACE, and it can be reasoned that it must have uptaken reasonable amount of adriamycin and mitomycin. The treatment effect did not last and the hemangioma remained intact.

This particular case provides us with a unique experience through the incidental treatment of hemangioma together with HCC, using combination treatment of PEI and TACE. This lesion has puzzled us with its resilience and longevity, and perhaps when what previously thought was a small HCC survives multiple treatment modalities without obvious imaging changes, another possible diagnosis should be considered. Fortunately for the patient, no complication has occurred secondary to the inadvertent treatment of her hemangioma. It is important to identify hemangiomas in HCC patients to avoid unnecessary treatment.

BIBLIOGRAPHY


Figure 4. Dynamic CT two and half months after her third TACE showed the retention of lipiodol within the nodule (white arrow). Note the other lipiodol retention tumor in S8 near IVC (black arrow). The lipiodol retained in the hemangioma was no longer present in the next follow up CT.
與原位肝細胞癌並存之肝臟血管瘤經酒精注射及經肝動脈栓塞治療後的影像變化

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有症狀之肝臟血管瘤普遍以經血管栓塞，經皮穿肝酒精注射，或射頻消融術來治療均為文獻所認可。在此報告一個六十三歲女性患有肝硬化，原發性肝癌，及肝血管瘤。經過經皮穿肝酒精注射及經血管栓塞之後其肝血管瘤仍然存在。