Case 75
Hepatic Chemoembolization Resulting in Chemical Cholecystitis

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History

A 54-year-old female who had chemoembolization of the right hepatic artery 1 month ago, presented for restaging of breast cancer (Fig. 75.1).

Diagnosis

Hepatic chemoembolization resulting in chemical cholecystitis

Findings

- Large masses in the right hepatic lobe that are T1 hypointense and T2 hyperintense (curved arrow).
- Masses demonstrate a necrotic photopenic center and no significant FDG uptake on fusion images consistent with treated metastases.
- Gallbladder demonstrates diffuse increased wall thickening (arrowheads) with mildly increased FDG activity that reflects chemical cholecystitis from chemoembolization.

Discussion

Transarterial chemoembolization therapy (TACE) is a method of administrating localized chemotherapy directly to a liver tumor via a transarterial catheter. TACE is most commonly used for the treatment of hepatocellular carcinoma (HCC). However, TACE has also been used in the treatment of colorectal metastases as well as primary cholangiocarcinoma. HCC after TACE typically demonstrates variable signal intensity on T1- and T2-weighted sequences. Hypointensity within a lesion on T2-weighted sequences typically corresponds to areas of coagulation necrosis, while conversely, hyperintensity corresponds to hemorrhage or residual tumor. It can be difficult to ascertain viable tumor from necrotic areas on non-contrast sequences. On post contrast images, viable tumor will demonstrate post gadolinium enhancement while necrotic tissue will not. Iodized oil results in beam hardening artifact on CT, which may hinder assessment of post contrast enhancement on CT. Lipiodol does not alter signal intensity on MRI, thus making it easier to identify residual tumor on gadolinium-enhanced MR images. However, it may be difficult to

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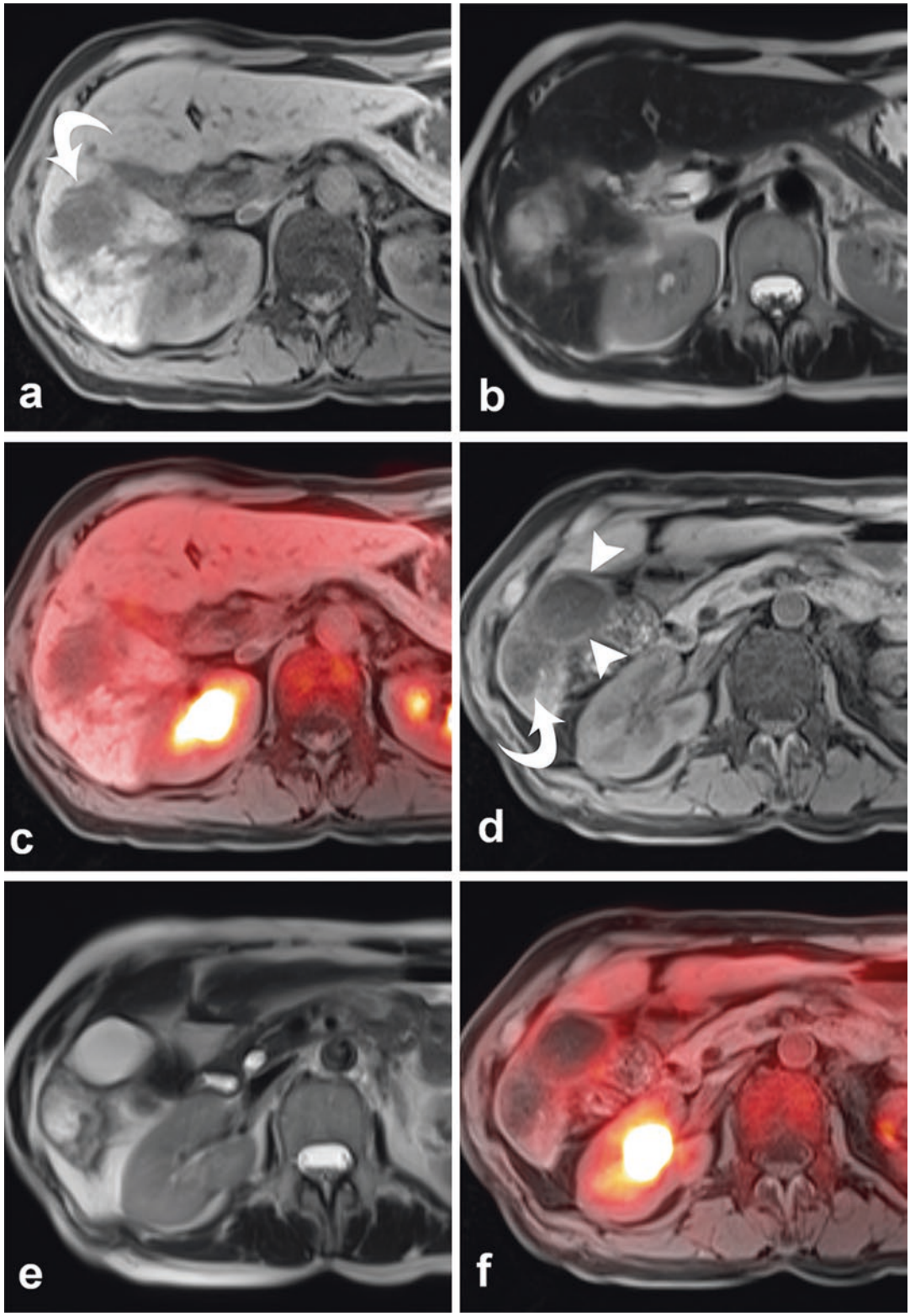

Fig. 75.1 T1 radial VIBE with fat suppression axial (mid liver) (**a**), T2 HASTE axial (mid liver) (**b**), PET/MR T1 radial VIBE with fat suppression axial fusion (mid liver) (**c**), T1 radial VIBE with fat suppression axial (lower liver) (**d**), T2 HASTE axial (lower liver) (**e**), and PET/MR T1 radial VIBE with fat suppression axial fusion (lower liver) (**f**)

appreciate small areas of residual tumor as the tumor capsule typically appears as a hyperintense ring on both early and delayed post contrast sequences. In these equivocal cases, subtraction images may provide additional value. In addition, metabolic information provided by PET can prove helpful.

As we know, FDG is a glucose analog and becomes trapped within highly active tumor cells after being metabolized into FDG-6-phosphate. The normal liver is typically concentrated in glucose-6-phototase activity causing rapid dephosphorylation resulting in lower background activity. Together, these differences may result in visible increased FDG uptake in viable HCC. However, some HCCs can demonstrate relatively low FDG uptake, despite viability, secondary to dephosphorylation. Decreased or absent FDG uptake after TACE in a previously FDG avid HCC lesion has been associated with tumor necrosis. Studies have demonstrated that decreased FDG uptake is not only more sensitive than CT findings, but often may occur earlier than CT changes. Limited resolution of PET scanners and respiratory motion during acquisition may limit the utility of PET in the evaluation of smaller tumors (<1 cm in size). Overall, PET and MRI can play a complimentary role and help in better assessment of liver lesions in these otherwise challenging post TACE cases.

Typically for right hepatic lobe chemoembolization, the catheter is placed in the right hepatic artery beyond the cystic artery origin. However, this is sometimes not possible, as the extent of disease in the right hepatic lobe requires placement of a catheter before the origin of the cystic artery. This can lead to embolization of the cystic artery and can result in chemical cholecystitis. This appears as thickened gallbladder wall on MR images. Most cases of chemical cholecystitis can be managed conservatively.

Suggested Reading

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