We present F-18 FDG PET/CT images of a patient with non-Hodgkin's lymphoma (NHL) that shows the rim sign in the right hepatic lobe. A 56-year-old woman with NHL was referred for F-18 FDG PET/CT scan to restage after chemotherapy. F-18 FDG PET/CT images showed a photopenic area in the right hepatic lobe surrounded by a rim of increased hepatic activity adjacent to the gallbladder fossa (“rim sign”). In follow up, severe acute cholecystitis with empyema and accompanying inflammation of the porta hepatis were observed during surgery. The rim of increased F-18 FDG activity may explain F-18 FDG activity of inflammation of the hepatic parenchyma adjacent to the inflamed gallbladder.

**Key Words:** Rim sign; F-18 FDG PET/CT; cholecystitis

**ABSTRACT** We present F-18 FDG PET/CT images of a patient with non-Hodgkin’s lymphoma (NHL). A 56-year-old woman with NHL was referred for F-18 FDG PET/CT scan to restage after chemotherapy. F-18 FDG PET/CT images showed a photopenic area in the right hepatic lobe surrounded by a rim of increased hepatic activity adjacent to the gallbladder fossa (“rim sign”). In follow up, severe acute cholecystitis with empyema and accompanying inflammation of the porta hepatis were observed during surgery. The rim of increased F-18 FDG activity may explain F-18 FDG activity of inflammation of the hepatic parenchyma adjacent to the inflamed gallbladder.

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Cholescintigraphy with 99m-Tc labeled iminodiacetic acid (IDA) derivatives has proved to be extremely reliable in the evaluation of suspected acute cholecystitis. The rim sign was attributed to mechanical obstruction caused by bile canaliculi as a result of inflammation and edema of the hepatic parenchyma adjacent to the inflamed gallbladder, delayed excretion of radionuclide because of injury of hepatocytes in the inflamed region, and increased blood flow caused by inflammatory hyperaemia on Tc-99m IDA imaging. In a report by Gupta et al, the rim-like increased uptake of FDG presumed to be due to stretching and contraction of the smooth muscle of the distended gallbladder wall from complete common bile duct obstruction. F-18 FDG is a nonspecific tracer and it has been found to accumulate at sites of neoplasm, infection, and inflammation. The uptake of F-18 FDG in metabolically active macrophages would explain its increased accumulation in benign inflammatory lesions. It is clear that the rim of increased F-18 FDG activity is related in F-18 FDG activity of inflammation of the hepatic parenchyma adjacent to the inflamed gallbladder.

This case indicates that a rim sign may be seen with F-18 FDG /PET images and may have the diagnostic significance for cholecystitis.

**FIGURE 1A**: The patient was imaged using an integrated PET/CT camera (one hour after the administration of 465 MBq FDG), which is consists of a 6-slice CT gantry integrated on a LSO based full ring PET scanner (Siemens Biograph 6, IL, Chicago, USA). The CT portion of the study was performed just for defining anatomical landmarks and making attenuation correction on PET emission images. Maximum intensity projection (MIP) PET image shows (A) a photopenic area in the right hepatic lobe surrounded by a rim of increased hepatic activity (the “rim sign”).
Figure 1B: Demonstrated the photopenic area in the right hepatic lobe surrounded by a rim of increased hepatic activity adjacent to the gallbladder fossa with SUVmax of 6.75 (corrected by body weight). (The fusion F-18 FDG PET/CT images).

References