

# Anomalous placed suprahepatic gall-bladder: A case detected on F-18 FDG PET/CT

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## ABSTRACT

The purpose of this study was to appraise the imageologists of a possible mislocalization of tracer accumulation to anomalously placed gallbladder during positron emission tomography-computed tomography (PET/CT) examination. PET/CT is increasingly playing an important role in staging and restaging of the disease process in cancer patients. With the advent of fusion imaging, the tracer accumulation can be correctly localized to a structure or lesion on CT. We did a staging PET/CT scan of a patient with hepatocellular carcinoma for liver transplant evaluation. Fluorine-18 fluorodeoxyglucose (F-18 FDG) was used as a tracer and the scan was performed on SEIMENS Biograph-mCT PET/CT machine. We noted the tracer accumulation at the superior surface of liver, which was localized to the anomalously placed gallbladder in suprahepatic subdiaphragmatic location. The anomalously placed gallbladder can create localization confusion. Keeping the possibility of ectopically placed gallbladder in mind, the imageologist can better localize the tracer uptake.

**Keywords:** Mislocalization, PET/CT, suprahepatic gallbladder

## INTRODUCTION

When the gallbladder is not visualized in its normal location, the possibility of its ectopic location should be considered. A case of incidentally detected anomalous position of gall bladder causing confounding problem in interpretation of PET-CT is described.

## CASE REPORT

A 70-year-old man, with h/o chronic liver disease and suspected of hepatocellular carcinoma [serum alpha-fetoprotein (AFP) 5024 ng/ml] was subjected to fluorine-18 fluorodeoxyglucose positron emission tomography (F-18 FDG PET)/computed tomography (CT) imaging. A focal FDG avid soft tissue was noted in the suprahepatic subdiaphragmatic location. Rest of the liver revealed non-FDG avid lesions in segments III and VIII. On viewing the fused PET/CT images, the radiotracer accumulation was localized to the anomalously placed suprahepatic gallbladder.

Magnetic resonance (MR) images of the same patient confirmed the presence of the suprahepatic gallbladder [Figure 1].

## DISCUSSION

Routine imaging of the gallbladder demonstrates a wide array of imaging variants, including anomalies in location, number, and configuration. An awareness of these normal variants would prevent misdiagnosis and aid in the assessment of differential diagnostic possibilities.

Normally, the gallbladder is situated adjacent to the inferior surface of the liver, in the plane of the interlobar fissure, with the gallbladder neck maintaining a constant relationship to porta hepatis. The gallbladder is generally found in the right upper quadrant, but may be seen in other parts of the abdomen. While anomalous positions are rare, the most common of these are (1) under the left hepatic lobe, (2) intrahepatic, (3) transverse, and (4) retroplaced (retrohepatic or retroperitoneal). The lesser common of these are (1) supradiaphragmatic and (2) suprahepatic. Gallbladder is intrahepatic during the embryonic period and becomes extrahepatic only later. An intrahepatic gallbladder<sup>[1]</sup> (usually a congenital anomaly) has a subcapsular location along the anterior inferior right lobe of the liver. This poses a problem for scintigraphy, as an intrahepatic gallbladder can cause a focal defect<sup>[2]</sup> (pseudo-space-occupying lesion); ultrasonography can be helpful in these cases. A left-sided

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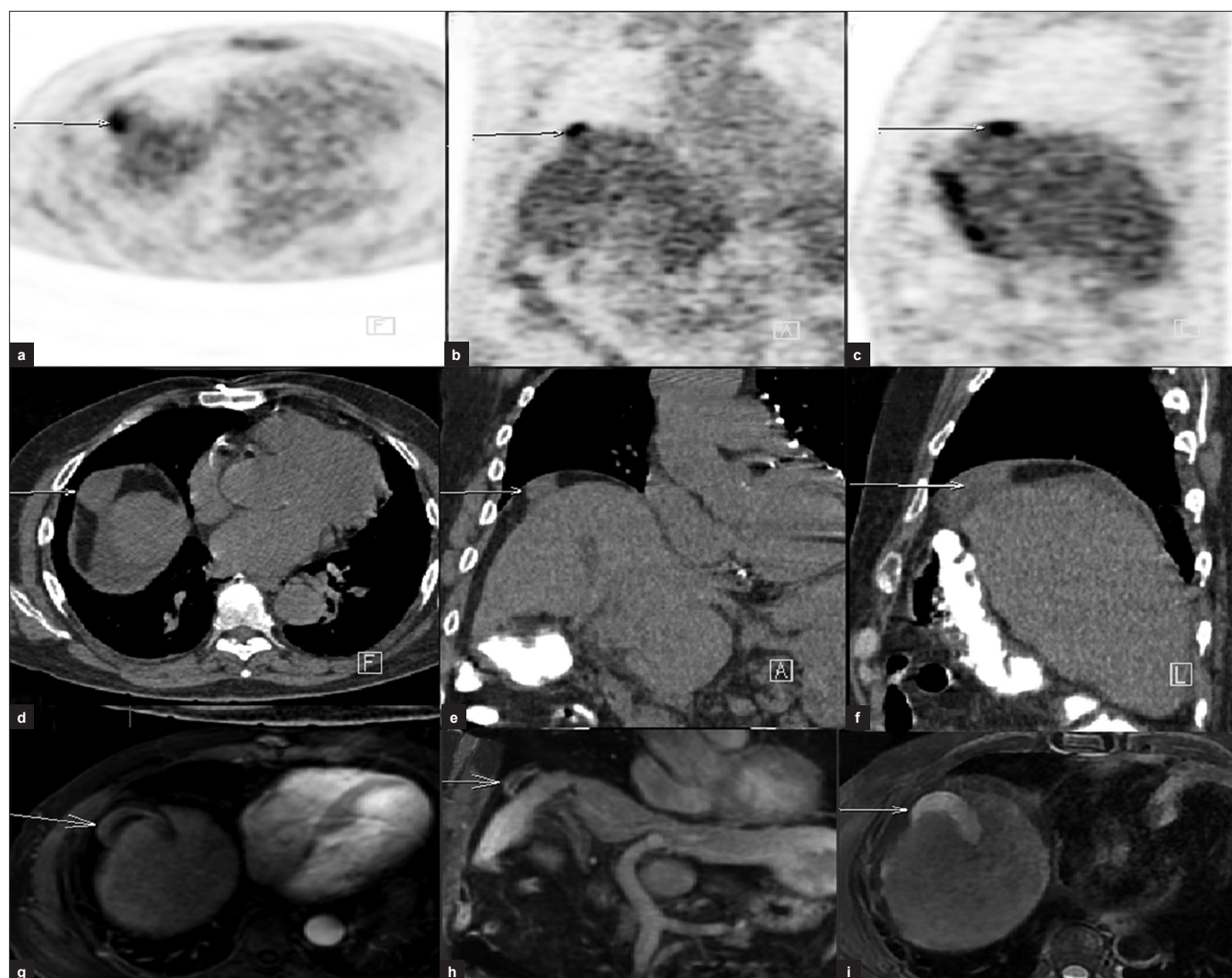


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**Figure 1:** (a) Transaxial view of PET image showing suprahepatic subdiaphragmatic gallbladder with tracer uptake; (b) Coronal view of PET image; (c) Sagittal view of PET image; (d) Transaxial view of CT image; (e) Coronal view of CT image; (f) Sagittal view of CT image; (g) Transaxial view of post-contrast T1-weighted MRI image; (h) Coronal view of post-contrast T1-weighted MRI image; (i) Transaxial view of T2 fat saturated MRI image shows gallbladder as a bright structure

gallbladder location is seen *in situs inversus* totalis. A gallbladder in the left upper quadrant without situs inversus is even rarer. The retroplaced gallbladder is rare and is either congenital or acquired. Gallbladder rotation and/or displacement can be caused by hepatic lobe abnormalities, viz. aplasia, hypoplasia and hypertrophy, or by abnormal mobility of the gallbladder itself.

The suprahepatic region is among the rarest sites, and very few reports have appeared in either the surgical or radiological literature.<sup>[3-5]</sup>

Of the very few reports on the suprahepatic gallbladder, one refers to a normally inserted organ that rotated 180° upward to an intrathoracic position after eventration of the diaphragm. In two other cases, an abnormally mobile gallbladder was found trapped between the chest wall and the upper border of the liver; this became symptomatic and caught the attention of the clinician and the imageologist.<sup>[5]</sup> Faintuch *et al.* reported three cases of suprahepatic gallbladder with hypoplasia of the

right hepatic lobe and upward migration of the gallbladder.<sup>[6]</sup> Gansbeke reported a case of suprahepatic gallbladder which was associated with hepatomegaly due to macronodular cirrhosis complicating existing hepatitis.<sup>[7]</sup> Kabaroudis reported a case of floating gallbladder associated with hypoplasia of the right hepatic lobe,<sup>[8]</sup> whereas Maeda had reported a similar case associated with hypoplasia of left hepatic lobe.<sup>[9]</sup>

## CONCLUSION

PET-CT is found to be useful in diagnosing this rare anatomical variant of ectopically located gall bladder and predicting its functional implication.

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