Late Port Site Metastasis from Occult Gall Bladder Carcinoma After Laparoscopic Cholecystectomy for Cholelithiasis: The Role of ^{18}F -FDG PET/CT

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Abstract Late port site metastasis of gall bladder carcinoma (GBC) after laparoscopic cholecystectomy is a rare finding. Rarer still is such a presentation where the GBC remained occult at histopathology. ^{18}F -fluorodeoxyglucose (^{18}F -FDG) positron emission tomography/computed tomography (PET/CT) can play an important role in this setting by supporting the diagnosis of port site metastasis, by demonstrating additional sites of metastasis, if any, and by ruling out any other primary site. We here present two such patients with late port site metastasis of occult GBC after laparoscopic cholecystectomy for cholelithiasis and discuss the role of ^{18}F -FDG PET/CT in this setting.

Keywords Gall bladder carcinoma · Laparoscopic cholecystectomy · Port site metastasis · ^{18}F -FDG · PET/CT

Introduction

Laparoscopic cholecystectomy is now becoming the standard of care for symptomatic cholelithiasis. In about 1 % of patients undergoing laparoscopic cholecystectomy, unsuspected gall bladder carcinoma (GBC) could be detected at histopathology [1]. It has been suggested that patients undergoing laparoscopic cholecystectomy are at increased risk of developing scar recurrence at laparoscopic port sites compared to those undergoing open cholecystectomy [2]. Very rarely, the primary GBC may remain occult even at histopathology and present later as port site metastasis [3, 4]. Functional imaging with ^{18}F -fluorodeoxyglucose (^{18}F -FDG) positron emission tomography/computed tomography (PET/CT) has been

employed for diagnosis of port site metastasis after laparoscopic surgery [5, 6]. We here present two cases of late port site recurrence from occult GBC after laparoscopic cholecystectomy for cholelithiasis and discuss the role of ^{18}F -FDG PET/CT in this setting.

Case Reports

Patient 1

A 58-year-old male presented with swelling over the right upper quadrant of the abdomen of 6-month duration. He had undergone laparoscopic cholecystectomy for symptomatic cholelithiasis about 4 years previously (July 2010). Histopathology after surgery revealed chronic cholecystitis. Apart from that, there was no significant past history. He was non-diabetic and nonhypertensive. On examination, a parietal swelling was seen in the right upper quadrant of the abdomen around the right mid-clavicular port site of laparoscopic cholecystectomy. Ultrasound of the abdomen confirmed an irregular hypoechoic lesion in the right abdominal parietal wall. Fine-needle aspiration cytology (FNAC) was suspicious for malignancy, such as adenocarcinoma. The serum CA-19.9 level was elevated (67.41 U/ml; normal <37 U/ml). The patient was then sent for ^{18}F -FDG PET/CT to determine the disease extent and rule out any other primary site. Contrast-enhanced PET/CT (Fig. 1) revealed a heterogeneously enhancing, ^{18}F -FDG-avid (SUVmax 4.1) parietal soft tissue mass of the abdominal wall along with ^{18}F -FDG-avid portocaval (SUVmax 7.3) and aortocaval (SUVmax 1.9) lymph nodes. No other hypermetabolic lesion (primary or metastatic) was seen in the rest of the body. Evidence of cholecystectomy was noted with surgical clips in situ. Based on the PET/CT findings, a diagnosis of metastasis from an occult GBC was made. Biopsy was done from the parietal swelling, which revealed moderately

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Fig. 1 A 58-year-old male with a prior history of laparoscopic cholecystectomy for cholelithiasis. Contrast-enhanced ^{18}F -FDG PET/CT was performed. Maximum intensity projection PET image (a) showing hypermetabolic focus in the right side of the abdomen (arrow) and in the portal region (broken arrow). No other abnormal hypermetabolic focus is seen in the rest of the body. Transaxial contrast-enhanced CT (b) and PET/CT (c) images of the abdomen showing a parietal abdominal wall lesion (arrow) with heterogeneous enhancement,

measuring 4.1×3.2 cm in size and showing intense ^{18}F -FDG uptake (SUVmax-4.1). Also noted were ^{18}F -FDG-avid portocaval (d, e, broken arrow, SUVmax 3.2) and aortocaval (f, g, broken arrow, SUVmax-1.9) lymph nodes. Also, note the post-cholecystectomy status with surgical clips in situ (d, e). Based on PET/CT findings, a diagnosis of port site recurrence with metastases to the portocaval and aortocaval nodes from an occult gall bladder carcinoma was made

differentiated adenocarcinoma, positive for CK19 and CK20, suggesting a cholangiogenic origin. The patient was started on gemcitabine and cisplatin-based chemotherapy. Reduction in

the size of the parietal swelling was noted after three cycles of chemotherapy. The patient is planned for follow-up PET/CT after completion of chemotherapy for response evaluation.

Fig. 2 A 59-year-old female with prior history of laparoscopic cholecystectomy for cholelithiasis. Contrast-enhanced ^{18}F -FDG PET/CT was performed. Maximum intensity projection PET image (a) demonstrating a hypermetabolic focus in the epigastric region, just to the left of the midline (arrow). No other abnormal hypermetabolic focus is seen in the rest of the body. Sagittal and transaxial contrast-enhanced CT (b, d) and

PET/CT (c, e) images showing a parietal abdominal wall lesion (arrow) with heterogeneous enhancement, measuring 5.5×4.4 cm in size and showing intense ^{18}F -FDG uptake (SUVmax 6.4). Also, note the postcholecystectomy status with surgical clips in situ (d, e). Based on the PET/CT findings a diagnosis of port site recurrence from an occult gall bladder carcinoma was made

Patient 2

A 59-year-old female presented with the complaint of an epigastric lump of 2-month duration. She had a history of laparoscopic cholecystectomy for gallstone disease about 2 years previously (March 2012). Postoperative histopathology was negative for malignancy and revealed chronic cholecystitis. She was hypertensive, controlled with medications. She was nondiabetic. On clinical examination, an epigastric parietal abdominal wall swelling was seen, just to the left of the midline, around the epigastric port site of laparoscopic cholecystectomy. FNAC from the swelling was suggestive of adenocarcinoma. The serum CA-19.9 level was also elevated in this patient (53U/ml; normal <37 U/ml). ^{18}F -FDG PET/CT was performed to determine the disease extent and rule out any other primary site. Contrast-enhanced PET/CT (Fig. 2) revealed a heterogeneously enhancing, ^{18}F -FDG-avid (SUVmax 4.1) parietal soft tissue mass of the abdominal wall. No other hypermetabolic lesion (primary or metastatic) was seen in rest of the body. There was evidence of cholecystectomy with surgical clips in situ. On the basis of the PET/CT findings, a diagnosis of port site metastasis from an occult GBC was made. Biopsy of the abdominal wall swelling revealed moderately differentiated adenocarcinoma, positive for CK19 and CK20, suggesting a cholangiogenic origin. The patient underwent surgical excision of the parietal wall lesion. She was advised to undergo gemcitabine and cisplatin-based chemotherapy, which she refused. She was doing fine at the 3-month follow-up.

Discussion

Incidental GBC at histology after cholecystectomy for cholelithiasis can be seen in about 3 % of specimens, warranting routine histopathological examination [7]. However, even with routine histopathological evaluation, some cases may be missed or remain occult [3, 4]. In many such instances, the diagnosis of malignancy is made only later after the appearance of metastasis. In both the patients described above, histopathology after cholecystectomy was negative for malignancy. However, years later both the patients presented with port site metastasis, which was compatible with GBC. Port site recurrence of GBC after laparoscopic cholecystectomy is not rare. Various factors have been proposed that could possibly be involved in the development of such port site metastases [8]. In fact, port site resection has been attempted in patients with incidentally discovered GBC after laparoscopic cholecystectomy, although it has not been found to affect the outcome [9].

^{18}F -FDG PET/CT is a robust tool in oncological imaging, useful in a variety of cancers. It has been employed for staging

and restaging of GBC [10, 11], as well as for its prognostication [12]. Many reports have also demonstrated the utility of ^{18}F -FDG PET/CT for detection of port site metastasis in GBC [5, 8]. Three major implications of ^{18}F -FDG PET/CT can be determined in this clinical setting. First, PET/CT can detect (if done for surveillance) or support the diagnosis of port site metastasis (as in the present cases). Second, it can demonstrate the disease extent and show or rule out any other sites of metastasis, if present. In the first patient in the present series, PET/CT demonstrated additional abdominal nodal metastasis, while ruled out any such site in the second patient. This finding can have a significant impact on further therapeutic management and prognosis. While patients with port site metastasis could be managed with surgical excision of the lesion, often supplemented with chemotherapy, those with widespread metastasis will require palliative chemotherapy. Finally, PET/CT can show or rule out any other primary tumor as the source of metastasis. This is especially important in the setting in which the initial histopathology is negative for GBC and there is late presentation, as in both above-described cases.

In conclusion, ^{18}F -FDG PET/CT can play an important role in the diagnosis and management of patients presenting with late port site metastasis from occult GBC after laparoscopic cholecystectomy for cholelithiasis.

Disclosure

Conflict of Interest Punit Sharma and Piyali Chatterjee declare that they have no conflict of interest.

Informed Consent All procedures followed were in accordance with the ethical standards of the Helsinki Declaration of 1975, as revised in 2000. However, since this was a retrospective report of only two cases, ethical committee permission was not required. Informed consent was obtained from all patients for inclusion in the study. All identifying information was omitted.

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