Abdominal Mesh Implant Showing FDG Uptake on PET/CT

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Abstract F-18 fluorodeoxyglucose (FDG) uptake by a mesh implant might be caused by a foreign body granulomatous reaction with inflammation and fibrosis, which can be demonstrated by positron emission tomography/computed tomography (PET/CT). A 71-year-old man underwent F-18 FDG PET/CT for the follow-up evaluation after an operation for colonic adenocarcinoma. On PET/CT imaging, there was a rectangular-shaped FDG uptake (maximal standardized uptake value, maxSUV: 3.4) in the anterior abdominal wall. On the review of the medical records, the patient had a history of herniorrhaphy for the reinforcement of the abdominal wall 2 months previously, using a mesh implant consisting of polytetrafluoroethylene (Teflon). We report a case of FDG uptake associated with surgical procedures including mesh implant on F-18 FDG PET/CT.

Keywords FDG PET/CT · Mesh implant · Inflammatory disease

Introduction

F-18 fluorodeoxyglucose (FDG) positron emission tomography (PET) has been increasingly used in various oncologic patients for staging, detecting recurrence and

monitoring of therapeutic response. However, FDG accumulation is not specific for malignancy and it is well known that inflammatory or infectious processes also accumulate FDG [1, 2]. Moreover, it has been frequently reported that FDG accumulated around surgical scars during healing [3, 4]. To avoid misdiagnosis, it is important to recognize such benign FDG uptake in FDG PET imaging. The authors report the case of a patient showing FDG uptake associated with a surgically inserted implant including mesh implant, along with a review of the literature.

Case report

A 71-year-old man underwent FDG PET/computed tomography (CT) for the follow-up evaluation following an operation for colonic adenocarcinoma. The patient was recurrence-free for 6 months after curative resection. PET/CT imaging was performed at 60 min after intravenous injection of 444 MBq (12 mCi) FDG using PET/CT scanner (Biograph Sensation 16, Siemens Medical Systems, Germany). On PET/CT imaging, there was a rectangular-shaped FDG uptake (maximal standardized uptake value, maxSUV: 3.4) in the anterior abdominal wall (Fig. 1), and otherwise, locoregional recurrence or distant metastasis was not observed. On the axial PET/CT imaging, this FDG uptake was located along the anterior abdominis muscles and CT component of PET/CT showed minimally increased attenuation of anterior abdominis muscle (Fig. 2a–c). Contrast-enhanced abdominal CT (CECT), which had been performed on the same day of PET/CT scan, revealed a thin layer of high attenuation lying just behind subcutaneous fat tissue of the anterior abdominal wall (Fig. 2d). On the review of the medical records, the patient had a history of herniorrhaphy for the

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Fig. 1 The anterior (a) and right lateral (b) views of F-18 FDG PET/CT maximum intensity projection image showed rectangular shaped-FDG uptake in the anterior abdominal wall (arrow, maxSUV: 3.4)

reinforcement of the abdominal wall 2 months previously, using a mesh implant consisting of polytetrafluoroethylene (Teflon). Laboratory findings representing acute inflammation [white blood cell (WBC) count, erythrocyte sedimentation rate (ESR) and c-reactive protein (CRP)] were within normal limits. We concluded that this hypermetabolic uptake was associated with granulation tissue developed after mesh implantation.

Fig. 2 Transaxial PET (a) and fusion (b) images showed a linear and almost symmetric F-18 FDG uptake in anterior abdominal wall. Non-contrast enhanced CT (c) and contrast-enhanced CT (d) images showed a thin layer of high-attenuating mesh implant (arrow) lying just behind subcutaneous fat tissue in the anterior abdominal wall

Discussion

FDG uptake is not specific for malignancy because active granulomatous processes such as tuberculosis [1] are well-known causes of false-positive results when evaluating oncology patients. Furthermore, infectious diseases without granulomatous reaction can also induce FDG uptake [2].

Recently, several cases of increased FDG uptake in mesh implants have been reported [5–10]. FDG uptake in the mesh implant might be caused by a foreign body granulomatous reaction with inflammation and fibrosis, which can be demonstrated by PET. On the PET/CT imaging, the carcinomatous pattern of the abdominal wall could be mimicked by inguinal mesh prostheses, even a very long time after implantation [5]. Such a source of false-positive results should be avoided by carefully reviewing the patient history and being familiar with long-term FDG uptake associated with Teflon granulomatous reaction [5, 9]. Such uptake has been reported in conjunction with prosthesis inserted for inguinal hernia repair [5], abdominal wall [6], vocal cord paresis [8, 9] and velopharyngeal insufficiency [10].

In the present case, at the time of the PET/CT examination and during the subsequent follow-up for 3 months, the patient did not have any laboratory and clinical findings for an acute infectious disease. Therefore, mesh infection could be ruled out and FDG uptake was considered most likely resulting from foreign body reaction around the mesh implant.

In conclusion, the authors have described a patient showing increased uptake of FDG in an anterior abdominal mesh implant. Knowledge of the clinical history and

familiarity with FDG uptake in mesh prostheses due to foreign body reaction might be useful for proper interpretation of PET/CT studies.

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