Interesting Image

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Tc-99m-MDP Uptake in Extraosseous Metastases From Ovarian Papillary Serous Adenocarcinoma

Over Papiller Seröz Adenokarsinomuna Bağlı Ekstraosseöz Metastazlarda Tc-99m-MDP Tutulumu

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Abstract

The uptake of Tc-99m-uptake of Tc-99m-methylene diphosphonate (MDP) on bone scintigraphy can be seen at sites other than bone in a varying number of benign and malignant conditions. Extraosseous metastatic calcifications can occur in ovarian papillary serous adenocarcinoma (PSAC). These extraosseous calcifications show Tc-99m-MDP uptake. We report a case of a female in her sixties who had a previous history of PSAC of the ovary. The patient had undergone neoadjuvant chemotherapy (NACT) followed by total abdominal hysterectomy and bilateral salpingo-oophorectomy. She also received adjuvant chemotherapy. Tc-99m-MDP bone scan was performed post chemotherapy because the patient complained of lower backache. The scan showed increased uptake in the lower thoracic and lumbar vertebral regions. However, single-photon emission computed tomography/computed tomography (CT) localizes the uptake to metastatic calcified peritoneal deposits. Further ^{18}F-fluorodeoxyglucose positron emission tomography/CT confirmed widespread peritoneal and omental metastatic disease with increased uptake.

Keywords: Tc-99m-MDP, metastases, ovarian papillary serous adenocarcinoma

Öz

Kemik sintigrafisinde Tc-99m-metilen difosfonatın (MDP) Tc-99m alımı, çeşitli iyi huylu ve kötü huylu durumlarda kemik dışındaki bölgelerde de görülebilir. Yumurtalık papiller seröz adenokarsinomunda (PSAC) ekstraosseöz metastatik kalsifikasyonlar meydana gelebilir. Bu ekstraosseöz kalsifikasyonlar Tc-99m-MDP alımını göstermektedir. Daha önce overde PSAC öyküsü olan altmışlı yaşlarındaki bir kadın hasta bildirilmektedir. Hastaya neoadjuvan kemoterapi (NACT), ardından total abdominal histerektomi ve iki taraflı salpingo-ooferektomi uygulandı. Ayrıca hasta adjuvan kemoterapi de aldı. Hastanın bel ağrısı şikayeti nedeniyle kemoterapi sonrası Tc-99m-MDP kemik taraması yapıldı. Tarama, alt torasik ve lomber vertebral bölgelerde artan alım gösterdi. Bununla birlikte, tek foton emisyonlu bilgisayarlı tomografi/bilgisayarlı tomografi (BT), metastatik kalsifiye peritoneal birikimlerin alımını lokalize etmektedir. İlave ^{18}F-florodeoksiglukoz pozitron emisyon tomografisi/BT, artan alımla birlikte yaygın peritoneal ve omental metastatik hastalığı doğruladı.

Anahtar kelimeler: Tc-99m-MDP, metastaz, over papiller seröz adenokarsinomu

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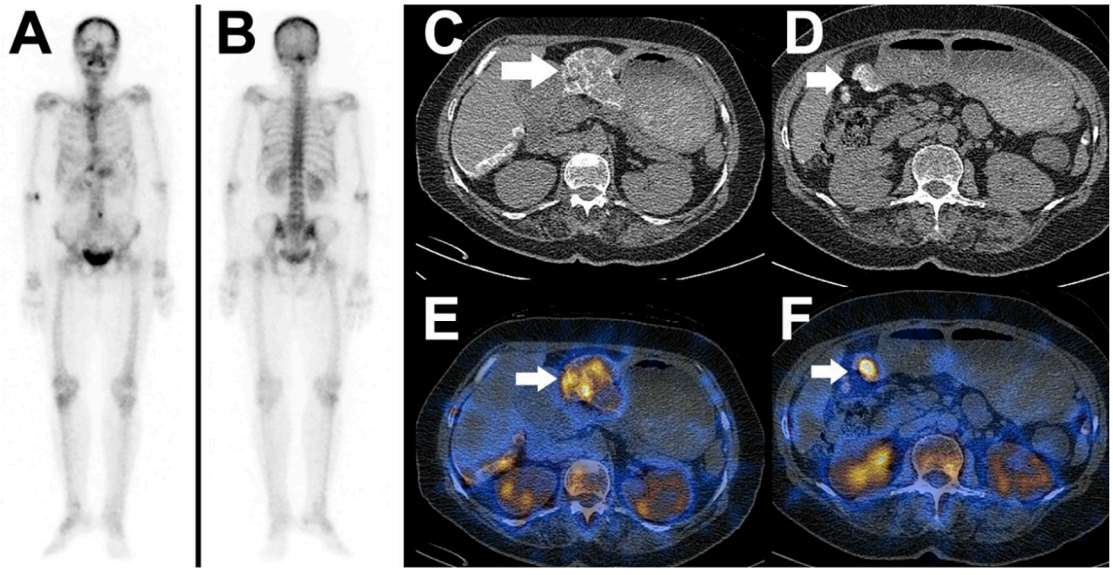

Figure 1. Ovarian cancer is the seventh most common cancer worldwide in women (1). The mortality rate is high, attributable to diagnosis at an advanced stage, which is often known to be a "silent killer" (2,3). Tc-99m-methylene diphosphonate (MDP) is a bone-seeking radiopharmaceutical used to rule out bone metastases. On bone scintigraphy, the uptake can be seen at sites other than the bone in a varying number of benign and malignant conditions. In this case, a woman in her sixties had stage III papillary serous adenocarcinoma (PSAC) ovary diagnosed almost 3 years ago (in 2020). She received three cycles of neoadjuvant chemotherapy and underwent total abdominal hysterectomy and bilateral salpingo-oophorectomy, infra-epiploic omentectomy, left paracolic peritoneum, and pelvic peritoneum removal. Thereafter, the patient was asymptomatic and was followed up. A follow-up contrast-enhanced computed tomography (CT) scan of the abdomen showed few hypodense lesions in the liver and multiple soft tissue lesions indenting the liver surface in the peritoneum and abdominal wall with few small bilateral lung nodules, which were suspicious for widespread metastases. Therefore, the patient received 9 cycles of adjuvant chemotherapy with paclitaxel and bevacizumab for 6 months. The patient presented with lower backache during the course of chemotherapy. Tc-99m-MDP bone scan was performed to rule out any bone metastases. (A, B): Anterior and posterior planar bone scan images show increased tracer uptake in the lower thoracic and lumbar vertebrae region, although the uptake in the lower thoracic vertebrae region is not limited to the bones. To rule out this dilemma, single-photon emission computed tomography/CT (SPECT/CT) of the abdomen and pelvis was performed. (C-F): axial CT and fused SPECT/CT images of the abdomen show tracer uptake in the calcified deposits along the surface of the liver (peritoneal) and other peritoneal deposits (arrows), suggestive of peritoneal metastatic disease ruling out bone metastases.

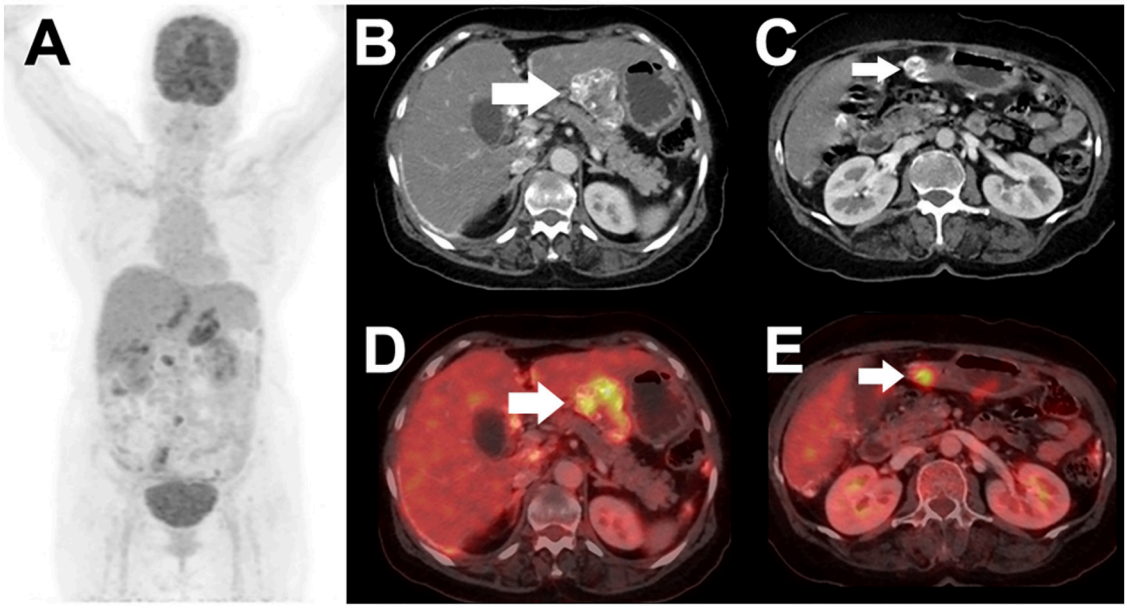

Figure 2. A further whole body (vertex to mid-thigh) ^{18}F-fluorodeoxyglucose (^{18}F-FDG) positron emission tomography/CT (PET/CT) was performed to assess the extent of metastatic disease. (A): maximum intensity projection image shows multifocal increased tracer uptake in the abdomen and pelvis in a pattern similar to Tc-99m-MDP uptake suggesting metastatic lesions. (B-E): axial CT and fused PET/CT images of the abdomen show hypermetabolic calcified deposits along the surface of the liver (peritoneal) and peritoneal deposits (arrows) suggestive of metastatic peritoneal disease. This finding of metastatic disease was supported by the serum CA 125 level, which was 1183.1 U/mL (Normal <30.2 U/mL). The patient is further started on a chemotherapy regimen including bevacizumab and carboplatin.

Many previously published studies have shown the uptake of Tc-99m-MDP in calcified metastases from Krukenberg tumor (4), endometrium, and ovary (5,6). This uncommon extraosseous accumulation can be explained by the affinity of Tc-99m-MDP for hydroxyapatite crystals and calcium precipitates (7) in soft tissue metastases from ovarian PSAC. Another explanation could be altered extracellular fluid and tracer handling dynamics and tumor neovascularization with altered capillary permeability (4,8). This extraosseous uptake on bone scans leads to misdiagnosis of bone metastases. Hybrid imaging like SPECT/CT, provides additional anatomic information and leads to localization of tracer uptake for further clarification, as in this case.

Ethics

Informed Consent: Written informed consent has been obtained from the patient for the publication of the case.

Authorship Contributions

Concept: K.A., P.S.S.P., G.K.P., Data Collection or Processing: K.B., Analysis or Interpretation: K.B., K.A., P.S.S.P., G.K.P., Literature Search: K.B., Writing: K.B., K.A.

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