

Potential role and implications of ^{18}F -FDG-PET/CT imaging in the detection and management of iliopsoas abscess

To the Editor: Proper management of retroperitoneal abscesses by percutaneous drainage relies upon a combination of clinical examination, abscessograms, and computerized tomography (CT) imaging. However, in the setting of renal insufficiency or a history of contrast allergy, unenhanced CT imaging may be unrevealing or misleading. In these patients, fluorine-18-fluorodeoxyglucose positron emission tomography (^{18}F -FDG-PET) imaging may prove invaluable. Although the role of PET/CT imaging in percutaneous abscess drainage has not yet been fully explored, PET/CT has proven its value in the management of infectious and inflammatory disorders in many other settings. We report an 82 years old woman with a right iliopsoas abscess whose successful management required the guidance of PET/CT imaging [1, 2].

Our patient presented with right hip prosthesis and hip pain. Imaging with CT of the region of concern revealed no obvious indication for percutaneous drainage. Although nonspecific enlargement of the right psoas, iliopsoas, quadratus lumborum, and right posterolateral abdominal muscles was visible, only several small scattered ovoid areas of fluid attenuation were visible (Fig. 1). However, PET imaging of this region revealed an extensive infectious process requiring therapy. Increased ^{18}F -FDG uptake was visible around the proximal right hip prosthesis, throughout the right psoas muscle, iliopsoas muscle, quadratus lumborum muscle, right posterolateral abdominal wall, and proximal right thigh muscles, in keeping with an extensive infection involving the hip prosthesis that extended into the proximal right thigh and right flank (Fig. 1). Based upon the more sensitive and specific PET findings, percutaneous drainage was performed with a clinically successful outcome.

Retroperitoneal abscesses, particularly those that involve the iliopsoas muscle, often have a nonspecific presentation, occult clinical course and can present a diagnostic challenge for the clinician. Successful treatment of iliopsoas abscess requires adequate drainage of the abscess cavity in combination with antibiotic treatment. Mortality in undrained cases can approach 100%, with sepsis being the most common cause of death [12].

The management of deep abscesses was revolutionized approximately two decades ago with the introduction of percutaneous abscess drainage, a minimally invasive technique that dramatically reduces the need for open surgery in the treatment of infected fluid collections not amenable to antibiotic treatment alone.

Percutaneous abscess drainage technique for iliopsoas abscesses does not substantially differ from abscess drainages in other portions of the body. A needle is percutaneously inserted into the abscess along the shortest practical path that avoids penetration of any adjacent vital structure (Fig. 2). As retroperitoneal abscesses are usually located at a sizeable distance away from the skin and within relatively featureless background tissue on radiography, these drainage procedures are generally performed under CT guidance, in light of the limitations of ultrasound and fluoroscopy in this setting. Using traditional Seldinger technique, a 10 to 14 French locking loop drainage catheter is inserted into

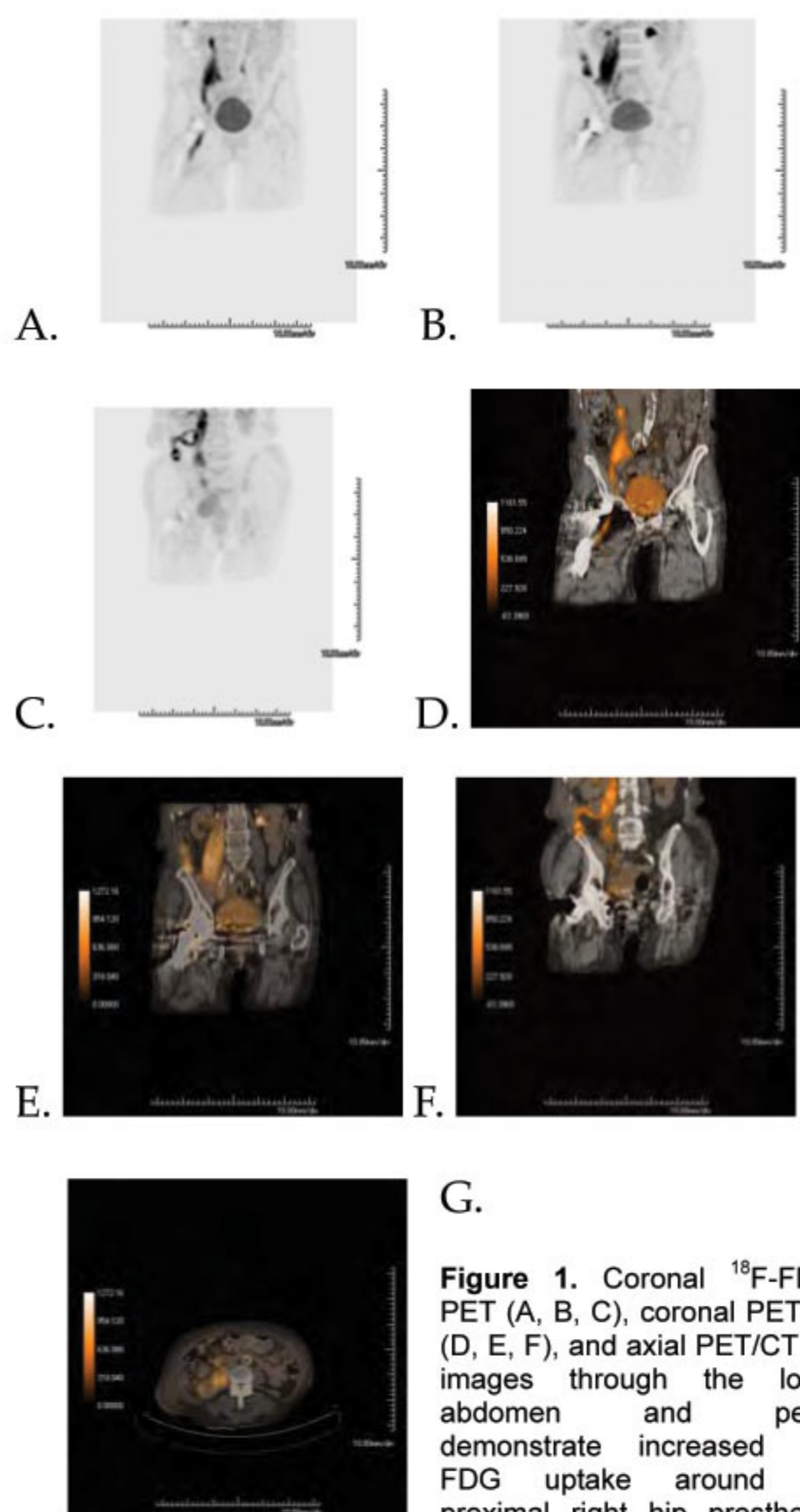


Figure 1. Coronal ^{18}F -FDG-PET (A, B, C), coronal PET/CT (D, E, F), and axial PET/CT (G) images through the lower abdomen and pelvis demonstrate increased ^{18}F -FDG uptake around the proximal right hip prosthesis, adjacent subcutaneous tissue, and in the muscles of the proximal anterior right thigh. Increased ^{18}F -FDG uptake was also noted in the right iliopsoas muscle extending from its origin to its insertion. In addition, enlargement of the right psoas, iliopsoas, quadratus lumborum, and right posterolateral abdominal muscles were present along with several ovoid areas of fluid attenuation and peripheral areas of increased ^{18}F -FDG uptake. The aforementioned findings were consistent with extensive infection involving the right hip prosthesis with extension into the proximal right thigh and right flank.

the abscess via this access and secured to gravity drainage. The management of a percutaneous drainage catheter is typically performed cooperatively with the referring service. In addition to monitoring the patient's vital signs and physical examination, the quantity and quality of the output from the drainage catheter are monitored daily. If needed, the drainage catheter may be exchanged and repositioned to facilitate optimal drainage. Once the patient's symptoms have improved and daily drainage falls below 10mL, the abscess cavity is evaluated by CT imaging and/or an abscessogram to determine if therapy is complete. Imaging with CT is not only useful in assessing if a drainage catheter remains in optimal position, but also for identifying any residual

undrained components, particularly with septated and viscous collections. Abscessograms obtained by contrast injection through the drainage catheter serve as a useful adjunct when the residual abscess cavity is collapsed or in identifying fistulous tracts between the abscess and a nearby structure that CT imaging may not reveal. Traditionally, if CT imaging and/or an abscessogram are negative in the setting of minimal drainage, therapy is considered complete and the percutaneous drainage catheter is removed.

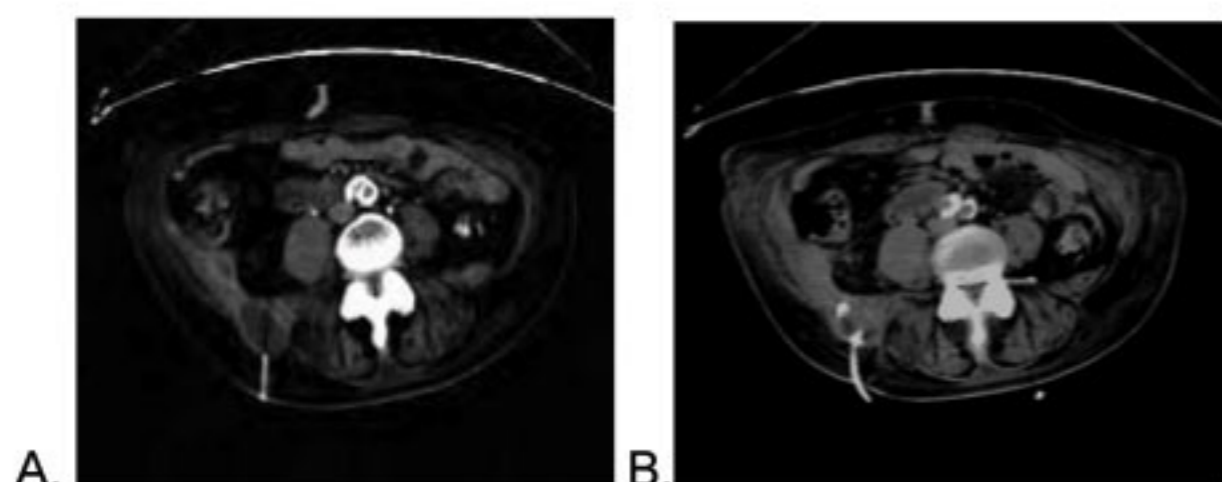


Figure 2. Based on PET/CT findings and under CT guidance, a needle was inserted via a posterior percutaneous approach into the main portion of the complex fluid collection (A). Using this access, a 12F locking loop drainage catheter was advanced into the collection (B), and 15mL of purulent material was aspirated.

Unfortunately, some iliopsoas abscesses may prove refractory to percutaneous abscess drainage. This is not usually due to a failure on the part of the drainage technique (and any required drainage tube revisions), but rather a result of the limitations imposed by conventional imaging modalities used to assess the progress of abscess drainage. If CT imaging or an abscessogram does not successfully reveal a residual collection, it is unlikely that the existing drainage catheter will be properly exchanged, revised and repositioned to drain the remaining collection. Rather, percutaneous drainage will be prematurely terminated, even though complete drainage may not yet have been completed.

Abscessograms are a straightforward and inexpensive way to evaluate abscesses, they are known to be misleading in the setting of septated and viscous collections, where injected contrast may not flow into components that are not in direct communication with the locking loop of the drainage catheter. CT imaging is more successful in identifying occult, adjacent abscess components, however it remains vulnerable particularly when a history of renal insufficiency or contrast allergy prevents administration of intravenous contrast, compromising the ability of radiologists to easily discern abscess from surrounding tissue, particularly with septated and viscous collections. In addition, if an abscess is situated near bony structures with substantial productive changes or a metallic prosthesis, the associated streak artifact can occasionally render evaluation of the surrounding tissue nondiagnostic.

Imaging with PET/CT may be a useful adjunct to conventional CT imaging and abscessograms and ^{18}F -FDG is an excellent tracer for detecting inflammation or infectious processes, and PET/CT imaging is an exciting adjunct imaging modality that may substantially improve the success rate of percutaneous abscess management, not only when collections are septated or viscous, but particularly in patients who are not candidates for intravenous contrast administration. In these more complex management settings, the absence of an allergy profile and possible damaging effects upon the kidneys

clearly augment the proven sensitivity in the detection of occult abscesses and abscess components by PET/CT imaging. *In conclusion*, in light of the morbidity and medical expenditures associated with unsuccessful percutaneous management of abscesses, particularly those situated within the retroperitoneum, it is likely that the savings gained from the use of PET/CT will offset its costs.

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