

종양 영상에서 PET/CT의 바른 이용

The Proper Use of PET/CT in Tumoring Imaging

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Abstract

PET using FDG has been proposed as a functional whole body imaging modality that images various types of malignancies with relatively high sensitivity and specificity in a reasonably short time. It depicts a lesion based on abnormal glucose metabolism whereas CT as a high - resolution anatomical imaging detects malignant process mostly based on altered anatomy. PET/CT combines the advantages of PET and CT, and has a great value in early detection of disease, accurate staging or restaging, early assessment of treatment response, decision on therapeutic plans, and rapid localization of recurrence. Exact anatomical localization of a lesion with increased FDG uptake by CT is considered to be the most important factor that improves the diagnostic accuracy of PET/CT. So far, limited studies have been reported using PET/CT in comparison with PET only and mainly proved additional value of PET/CT in malignant tumors in which conventional PET already had advantages over anatomical imaging. PET/CT appears to have a promising role in the field of radiotherapy planning. Another potential of PET/CT would be in the evaluation of tumors with low FDG uptake by way of CT or new PET tracers. PET/CT is in the stage of its early infancy and further studies remain to be performed to establish applications of PET/CT in clinical oncology. In this review, we will discuss the principle of PET, the background of the emergency of PET/CT, advantages, pitfalls, and debates of PET/CT along with clinical applications and future perspectives of thereof.

Keywords : PET/CT; CT; PET; FDG

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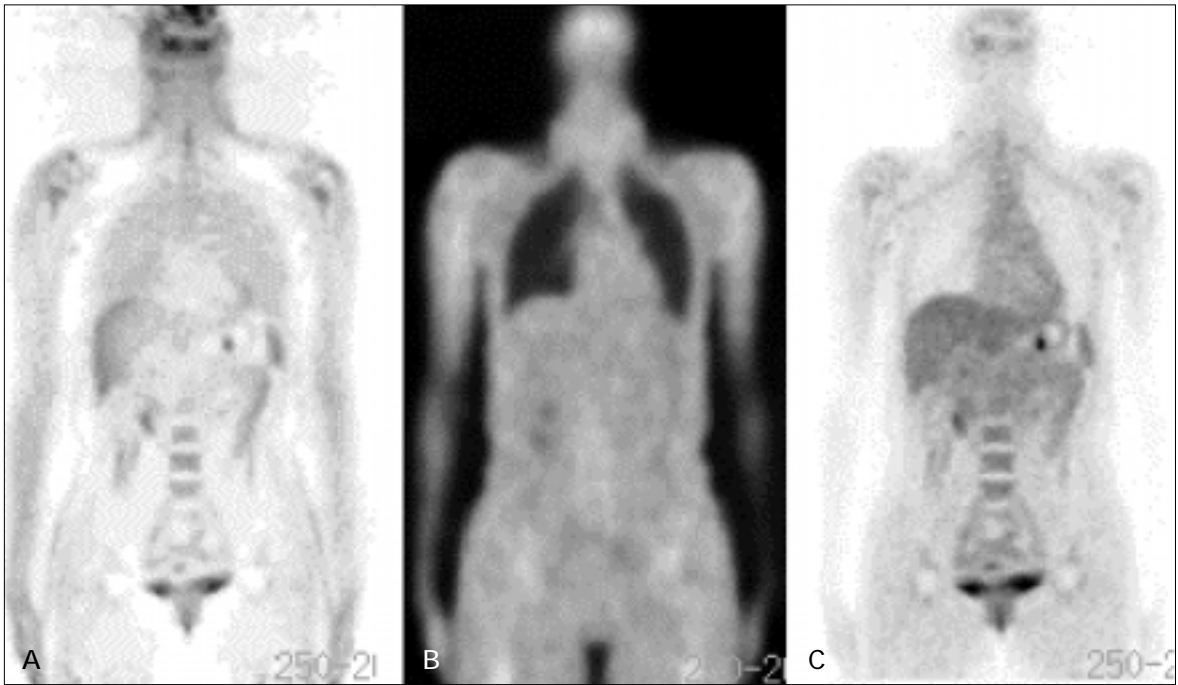
가

가

Positron

Emission Tomography(PET,

)



A) B) C)

PET X-ray PET/CT PET X-ray

가 1. PET (particle) (emi- PET/CT PET/CT ssion) 3 PET (positive charge) (positron) 가 . PET X-ray (Computed tomography, CT) X-ray가 - ray (1). - ray

PET X - ray (2). FDG PET 가

가 X - ray CT PET

1999 Uni-

University of Pittsburgh PET/CT

(1). PET/CT CT 가 (3).

가 . PET/CT PET PET 가

- ray CT가 20 30

X - ray CT 1 CT 가 . 가

PET

10 가

1 10 , 가

가

FDG PET

PET

F - 18 fluorodeoxy- FDG (molecule of century) 가 .

glucose(FDG) PET 가 . FDG (transporter)

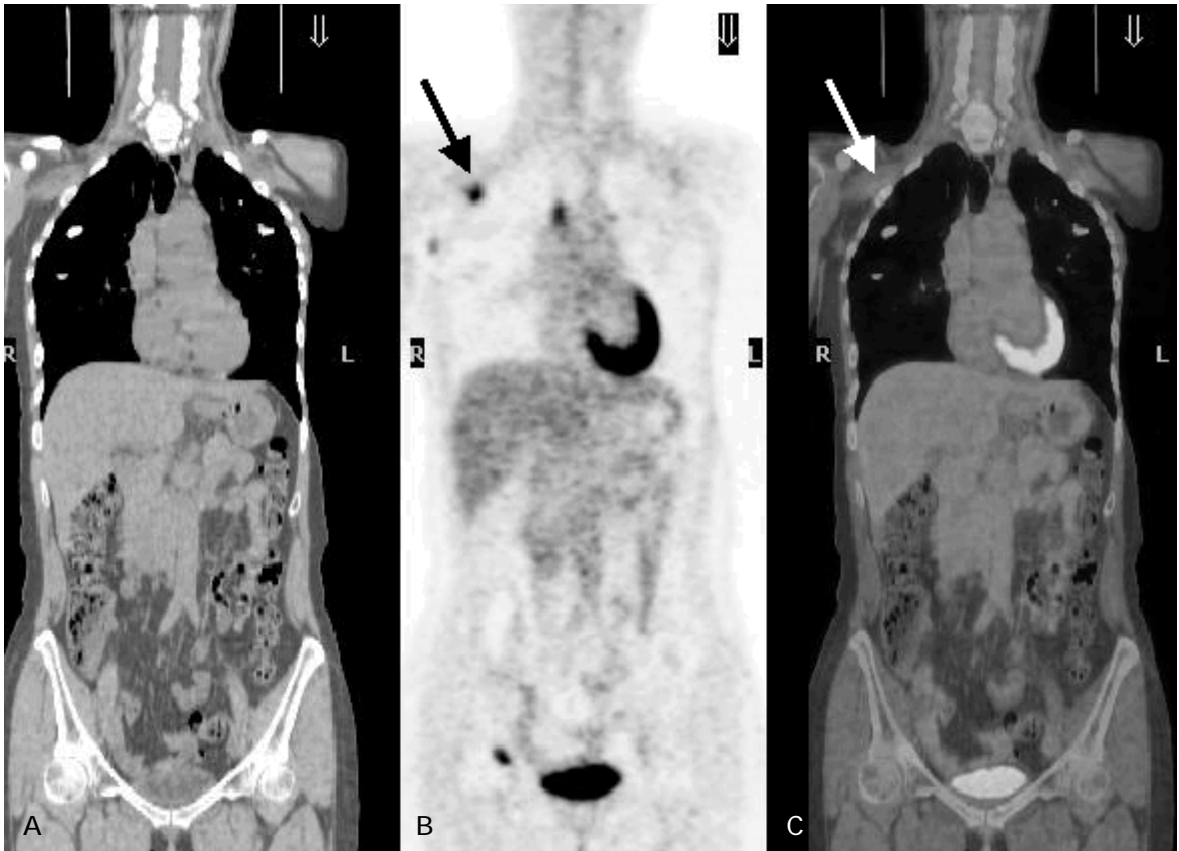
PET/CT 가

. FDG가 PET PET/CT가 가

FDG T , FDG

1930 ,

Warburg ,



A) CT

B) FDG PET

C) PET/CT

CT , PET

가

PET/CT

가

2. PET/CT

가

(6).

PET/CT가

(2, 3)(4, 5).

FDG PET

,

PET

가가

, FDG

PET/CT

가

PET/CT

가

가

PET CT

PET/CT

가

(7).

PET/CT가

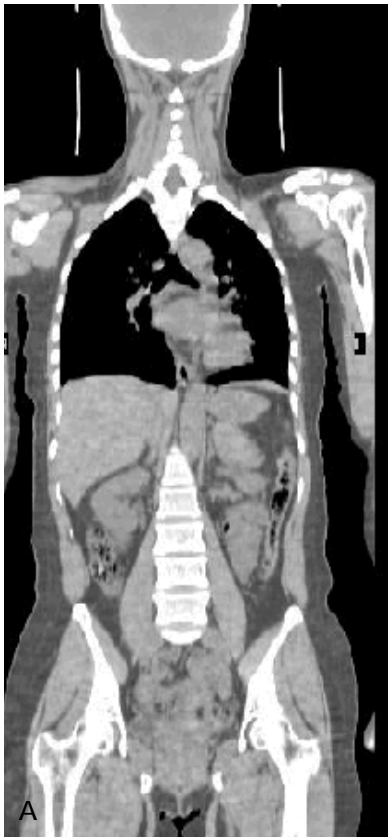
software

.

PET CT

CT

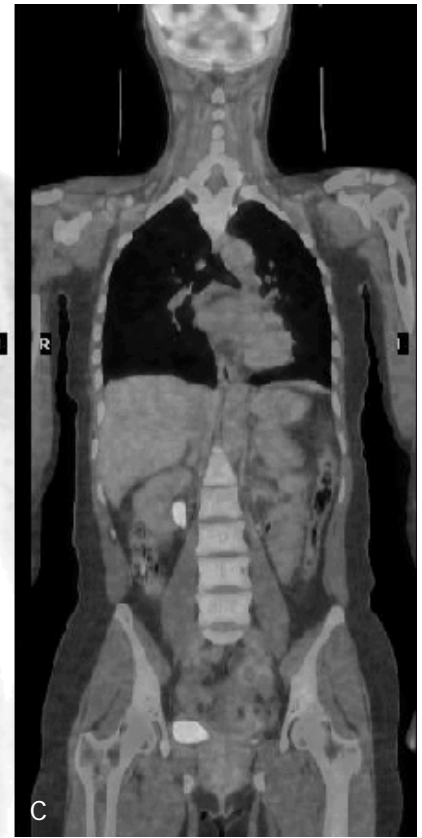
가



A) CT



B) PET



C) PET/CT

B FDG FDG CT brown fat

3.

PET/CT

PET/CT

(8, 9).

PET/CT

PET/CT

CT

가 가

가

PET

PET/CT

PET/CT

virtual colo-

가

noscopy

FDG

가

CT PET

가

가

(10).

FDG PET

, brown fat

FDG

가

(11).

CT 가 , , , 가 PET/CT가 (4).
 PET/CT CT 가 CT 가 가가
 CT .
 , PET , , , ,
 , CT가 PET/CT PET PET/CT
 가 (12). CT (6, 10, 13, 14).
 FDG 가 PET
 , 가,
 CT PET/CT 가 가 가 .
 FDG가 , FDG 가 PET CT
 , PET/CT .
 , FDG PET
 CT (12). PET/CT
 FDG FDG PET
 가 가 CT FDG
 . 가 가 가
 가 FDG PET
 FDG 가 가 40~50% FDG
 CT가 . 가

PET/CT (15). , Edmonson Steiner grade I
 grade II FDG 가 grade III
 PET/CT grade IV가 FDG 가 .
 PET FDG PET
 .
 PET PET/CT .
 FDG PET

(16). FDG PET/CT 가 PET CT .

FDG PET peripheral type hilar type

PET lipiodol 가 FDG CT . Peripheral type hilar type

(17). FDG 가 C - 11 acetate Ho FDG peripheral type , hilar type FDG PET , hilar FDG

FDG C - 11 acetate type

(15). C - 11acetate cyclotron 가 , hilar type 가 C - 11 acetate (20, 21).

가 F - 18 fluoroacetate FDG PET FDG

(22). peripheral type FDG PET 가

FDG Kinkel meta - analysis 가

(23). FDG PET , CT, MR FDG 가 가

가 (18). FDG PET FDG PET FDG 가 (22). FDG 가

PET/CT CT가 PET
 PET/CT 가 CT가 TNM
 PET
 가
 PET
 가
 PET/CT
 가
 FDG
 가 FDG 가
 가 PET/CT
 가 가

FDG PET

. PET system
 F - 18, C - 11, N - 13, O - 15

가
 C - 11 F - 18
 choline, acetate, thymidine,
 PET/CT

PET PET/CT
 FDG PET

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