

# 근골격계 핵의학 영상의 최신진전

## Recent Advances in Musculoskeletal Nuclear Medicine

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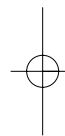
### Abstract

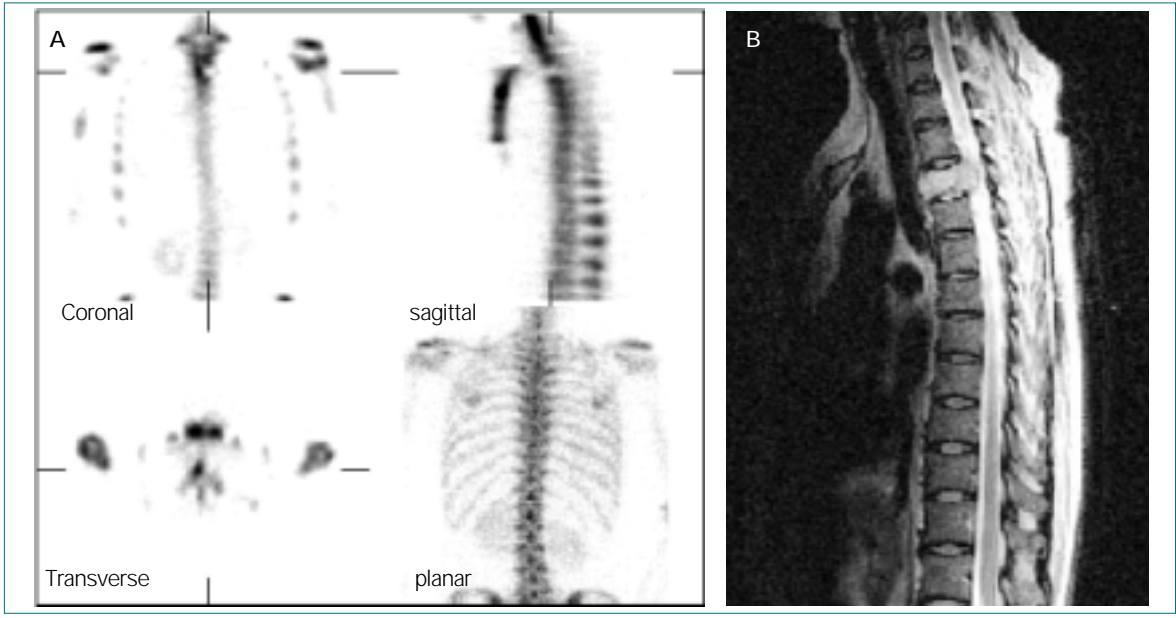
B one scintigraphy with  $^{99m}\text{Tc}$  - methylene diphosphonate is the most frequently performed procedure in routine nuclear medicine practice in Korea. Bone scintigraphy is an extremely sensitive procedure for evaluating a variety of skeletal disorders and has the advantages of whole body evaluation. The main indications for referral include screening of patients with malignancy, trauma, orthopedic problems, sports injuries, as well as endocrine and rheumatologic disorders. Recent advances in instrumentation and the subsequent improvement in image quality have allowed nuclear medicine physicians to provide more accurate bone scan interpretations. The unique diagnostic information provided by SPECT and new indications of bone scintigraphy have emerged. There is an increasing opportunity to use PET imaging with  $^{18}\text{F}$  or  $^{18}\text{F}$  - fluorodeoxyglucose for the evaluation of musculoskeletal diseases. The application of new radiopharmaceuticals has provided information on changes in pathophysiological and pathobiochemical process and allowed more specific diagnosis, particularly for infection and tumors. The correlative image interpretation with results of other nuclear medicine or radiological imaging modalities is important. The image registration using software or hardware fusion will provide a higher degree of diagnostic accuracy. The role of bone scintigraphy is still expanding and will remain as one of the most commonly performed nuclear medicine procedures because of its sensitivity, simplicity, and cost - effectiveness. With advances of new imaging technology and radiopharmaceuticals, the diagnostic algorithm should be reestablished.

**Key words :** Bone scintigraphy; SPECT; PET

· ; ;

(bone scan) 가 2000 38% (1). 가 가 , , , , 가  $^{99m}\text{Tc}$  - methylene diphosphonate (MDP)  $^{99m}\text{Tc}$  - hydroxymethylene diphosphonate (HDP)  $^{99m}\text{Tc}$  -





1. A) 52 SPECT (planar) SPECT  
3 MR T2 가

B) MR T2

SPECT (FDG) PET(FDG - PET)

가 가 (7). 2

가 가 CT FDG - PET

가 CT 가

$^{99m}\text{Tc}$  - MDP FDG -

가 (5). PET PET FDG -

PET 가 (8). FDG - PET

(6). FDG - PET

SPECT 가 FDG - PET

가  $^{18}\text{F}$  - Fluorodeoxyglucose lastoma) (neurob-  
(norepinephrine)

1.

Radiopharmaceutical	Uptake mechanism
$^{67}\text{Ga}$ citrate	Transferrin, lactoferrin receptor binding
$^{111}\text{In}$ oxine / $^{99\text{m}}\text{Tc}$ - HMPAO labelled leucocytes	Specific chemotatic activation
$^{99\text{m}}\text{Tc}$ - labeled anti - granulocyte antibody	Increased capillary permeability and specific binding or uptake as antibody to granulocyte
$^{111}\text{In}$ / $^{99\text{m}}\text{Tc}$ - labelled human immunoglobulin	Nonspecific via increased capillary permeability
$^{18}\text{F}$ - FDG	Upregulated GLUT - 1 in activated granulocyte, lymphocytes and monocytes
$^{99\text{m}}\text{Tc}$ - Ciprofloxacin	Specific binding to bacteria

(three phase bone scan)

$^{123}\text{I}$  - MIBG(methyliodobenzyl guanidine)

SPECT가

가 . 가 . 가  
가  
가  
가 가  
(11), 가  
“ flare phenomenon ”

$^{201}\text{Tl}$  - chloride

$^{99\text{m}}\text{Tc}$  - MIBI

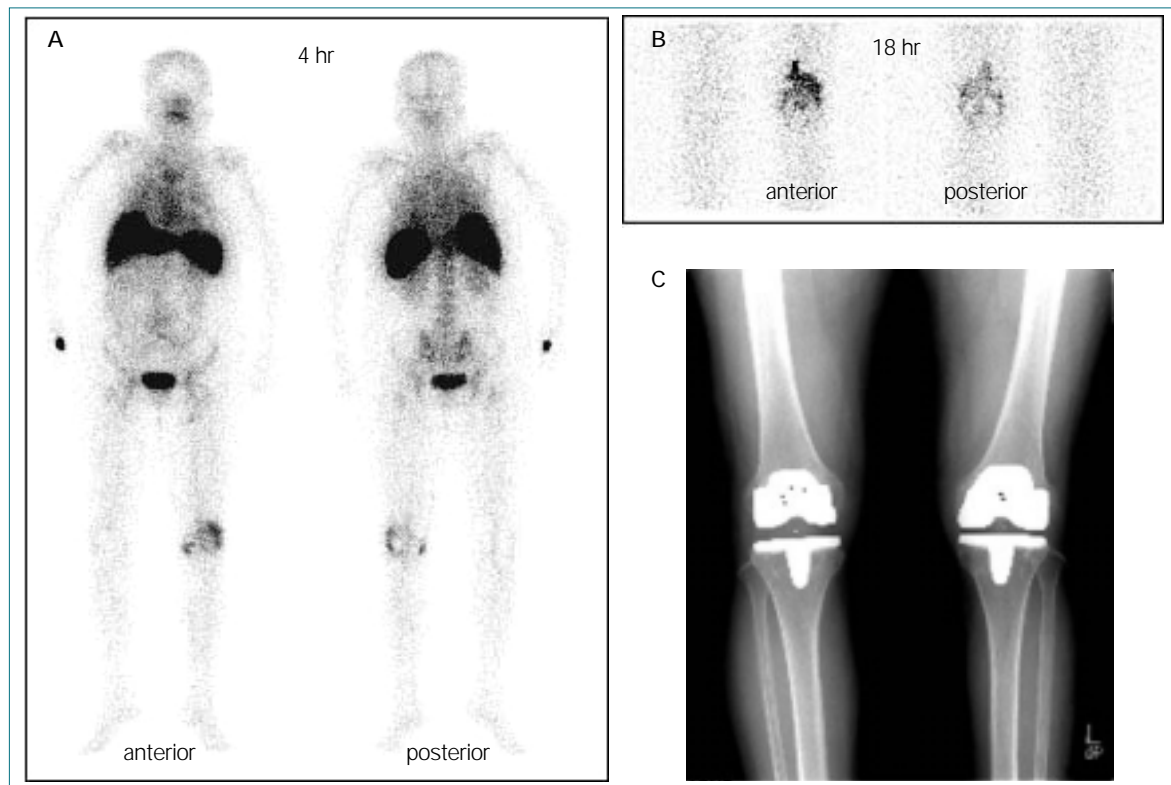
FDG - PET (9). 가  $^{99\text{m}}\text{Tc}$  -  
PET 가 HMPAO  $^{67}\text{Ga}$  .  
 $^{18}\text{F}$  - fluoride 3  
가 , 가 ,  $^{99\text{m}}\text{Tc}$  -  
가 .  $^{18}\text{F}$  - fluoride PET HMPAO  
SPECT,  $^{18}\text{F}$  -

PET

MRI CT

$^{18}\text{F}$  - PET 가  $^{99\text{m}}\text{Tc}$  - HMPAO 가 가  
(10) (12)( 2).  
가 (loosening) 가

Special Issue ·

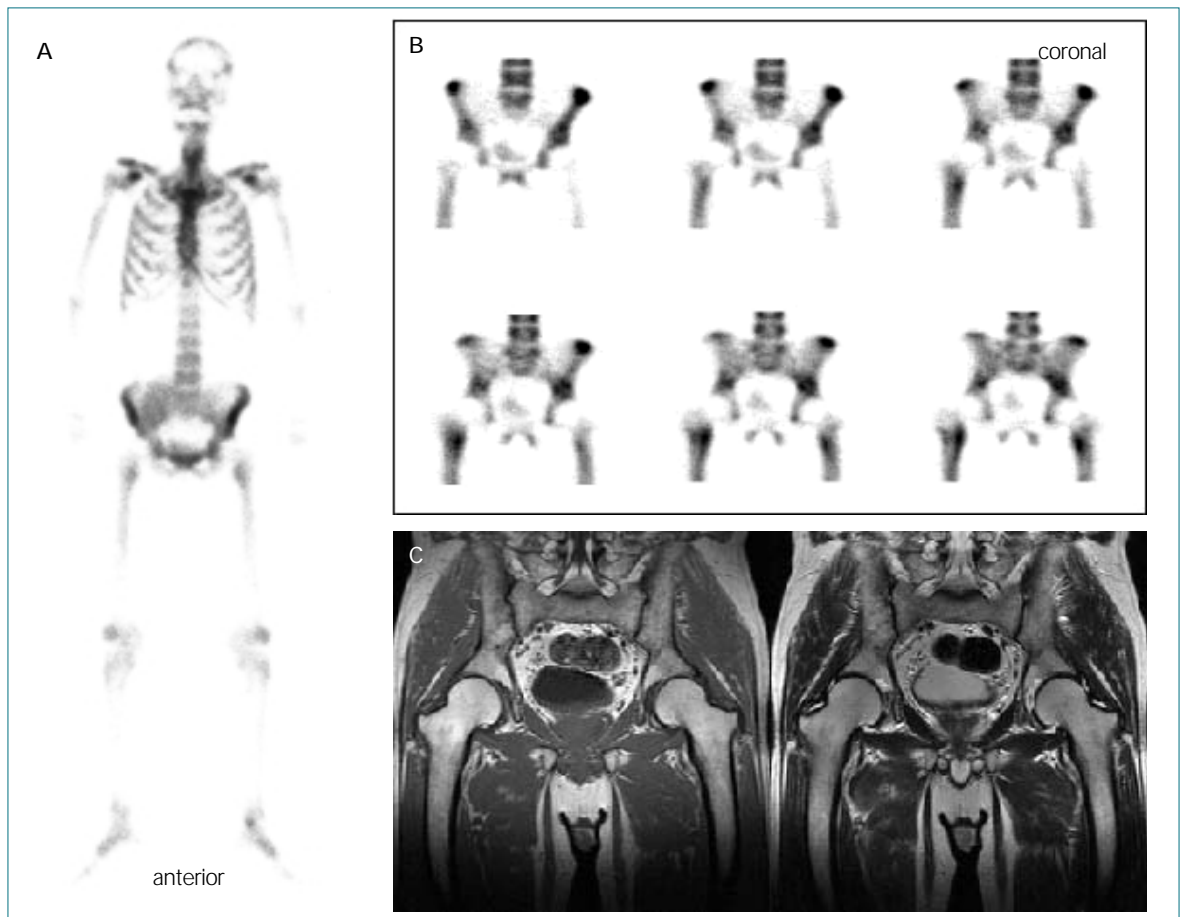


2. 3 4 (A) 18 (B) 68  $^{99m}\text{Tc}$  - HMPAO 가 가 (C)

가  $^{99m}\text{Tc}$  가 가 (14). (abs- (macrophage)  $^{18}\text{F}$  - FDG 가 가 FDG - PET 가 (15).

(13).

$^{99m}\text{Tc}$  ciprofloxacin



3. (B) MRI(C) T1, T2 MRI . SPECT 가 57 (A) SPECT 가

(occult fracture) 가 . 가

(stress fracture), (insufficiency fracture) 가 가 . SPECT

가 가 가 가 ,

가 (16). , 가

가 SPECT

## Special Issue

가

(facet joint syndrome), PET SPECT  
(spondylolysis), (spondy- 가  
lolisthesis) SPECT (19).  
(16). CT,  
MRI  
SPECT 가가 SPECT PET  
(cor-  
(avascular osteonecrosis) relative imaging), PACS  
가 가  
(fusion image)  
, SPECT PET CT  
MRI 가  
SPECT 가  
(20, 21).  
가 가  
MRI  
SPECT 가  
MRI  
(18)( 3). (cost - effective) (algorithm)

(metabolic bone disease),  
(reflex sympathetic dystrophy syn-  
drome), (heterotopic ossification)

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