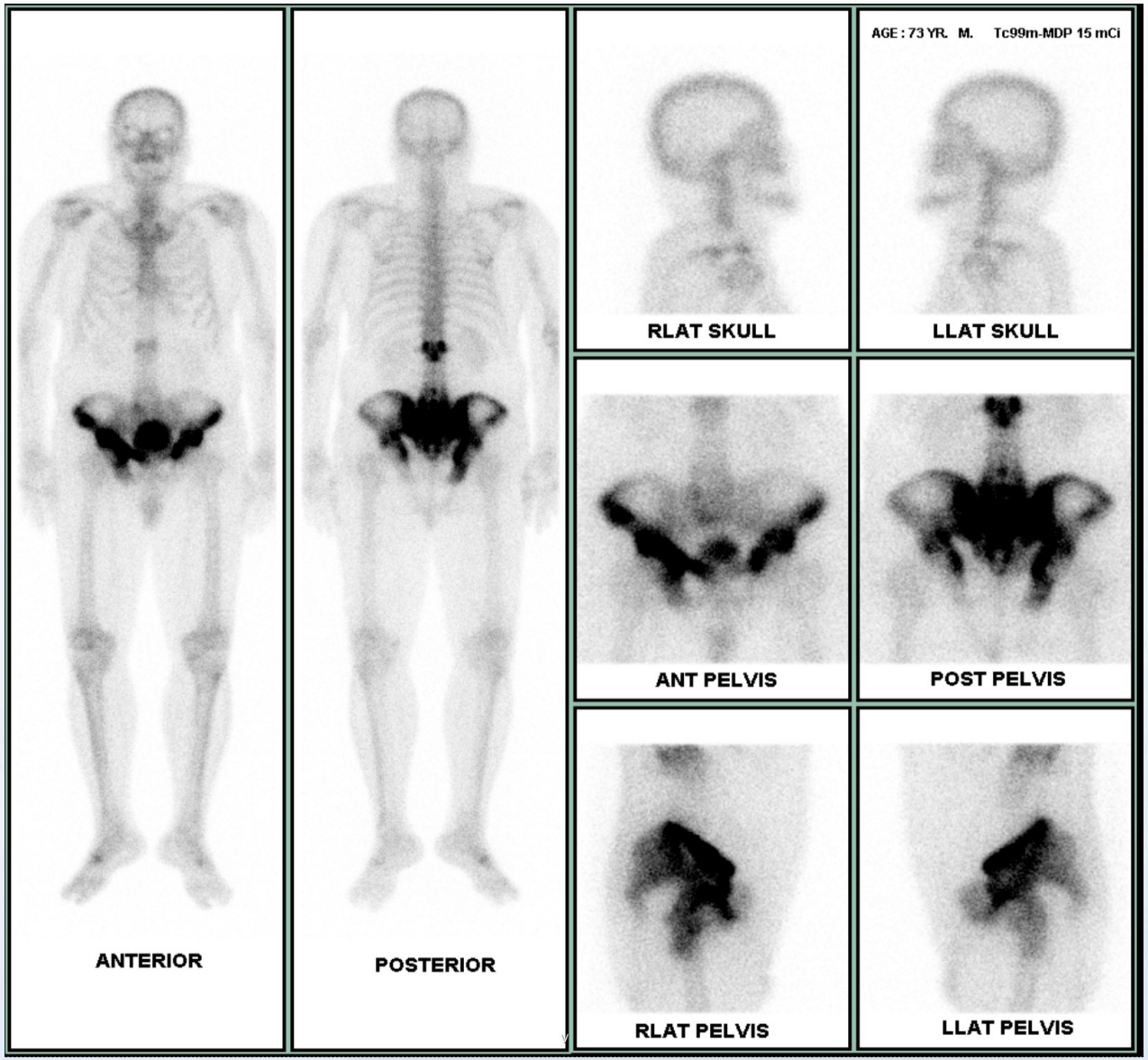
Mahidol University
Faculty of Medicine Ramathibodi Hospital

SpotDx

Paget’s disease of bone



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A 73-year-old man, asymptomatic

was referred to endocrine clinic
for consult abnormal bone scan images

What is the most likely diagnosis?

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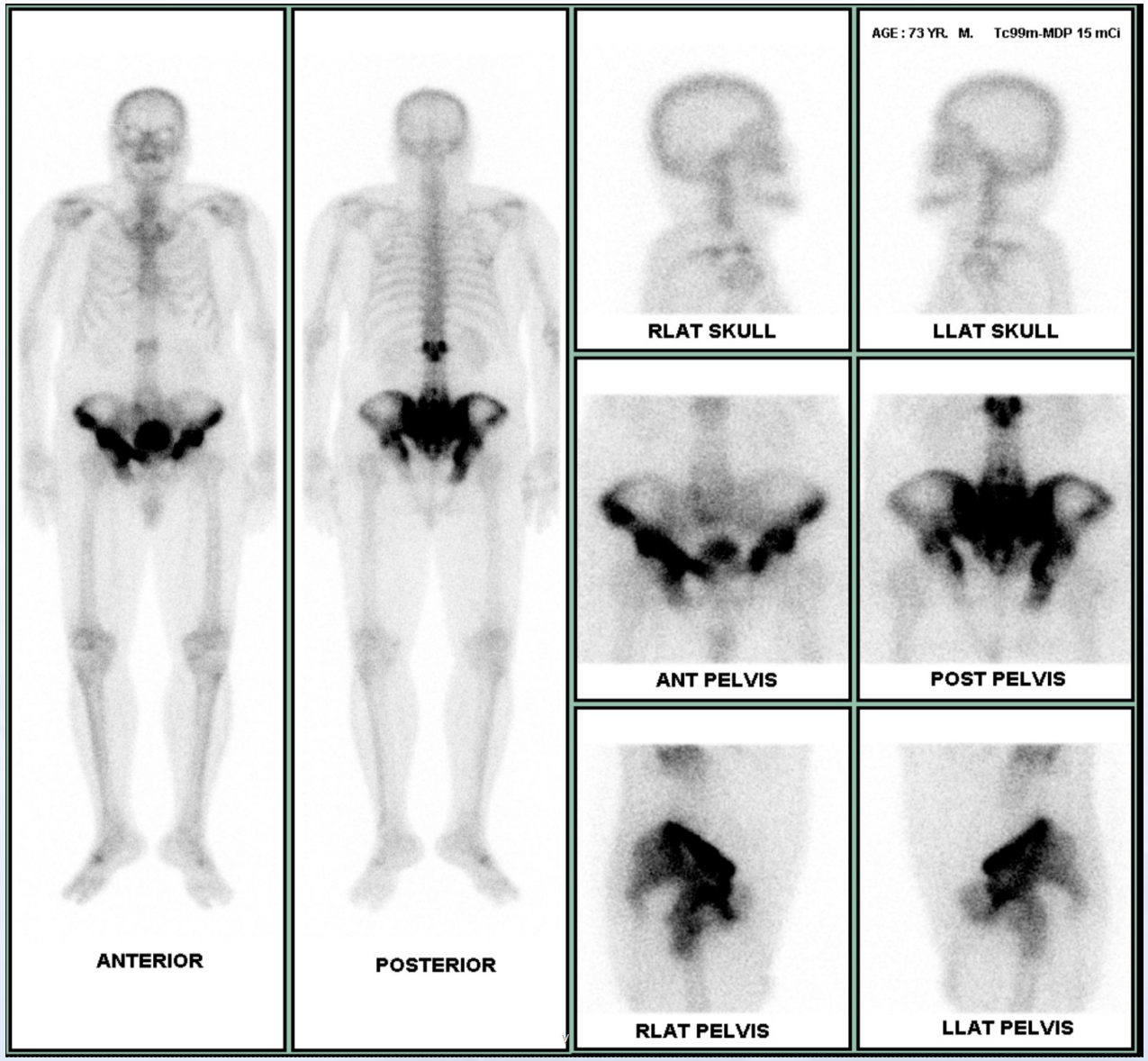


- Intensely increased radiotracer uptake at
  - L1 vertebra with inverted triangular shape as the *mickey mouse sign*
  - L5 vertebra, sacrum, bilateral pelvic bones
- Mildly increased uptake at mandible
- No photopenic area representing osteolytic bone lesion is obviously demonstrated in this study

Mickey mouse sign

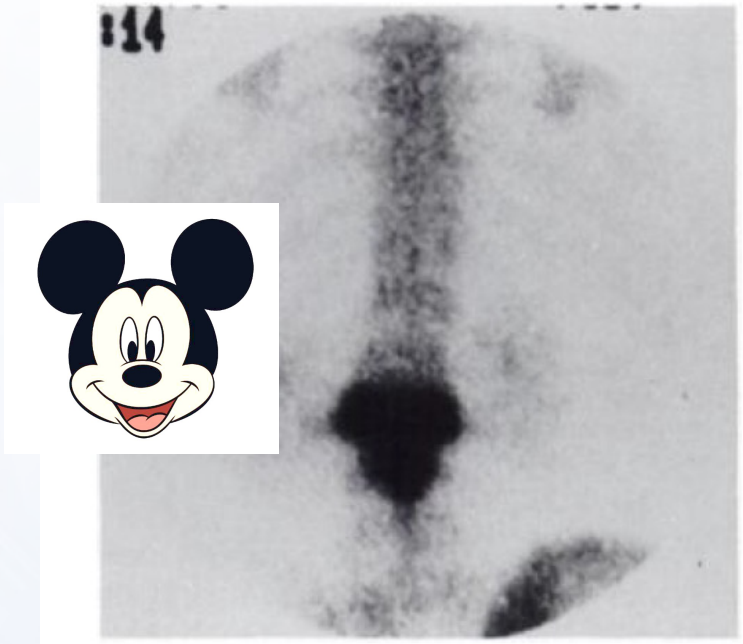


FIGURE 1. Bone scan shows the "Mickey Mouse" sign in the second lumbar vertebra: the pattern of uptake forms an inverted triangular pattern of three dots. Increased uptake in the superior portion of the right iliac bone is seen as well.

- **Markedly increased uptake** in vertebral body, posterior element and transverse spinous process of affected vertebra which form **inverted triangular pattern** resembles *mickey mouse* sillhouette
- The sign offered high specific value for diagnosis of Paget's disease of bone

J Nucl Med. 1993;34(7):1214-1216.

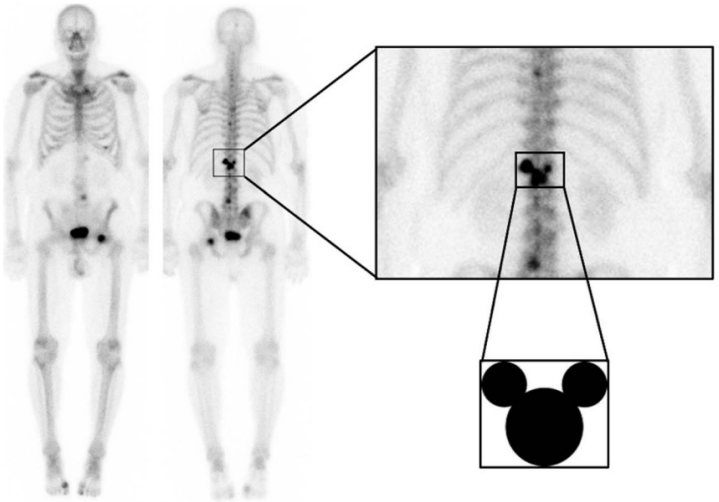
Shown are typical features of polyostotic Paget's disease, including focally enhanced radionuclide uptake that shows partial, as well as complete, bone involvement.

Bone scintigraphy typically demonstrates **marked increased uptake** of radionuclide due to high rate of bone formation and blood flow

Almost any bone can be affected, but there is a predilection for the **pelvis, spine, femur, tibia, and skull**

J Bone Miner Res. 2019;34(4):579-604.
N Engl J Med. 2006;355(6):593-600.

An 81-year-old man with prostate cancer



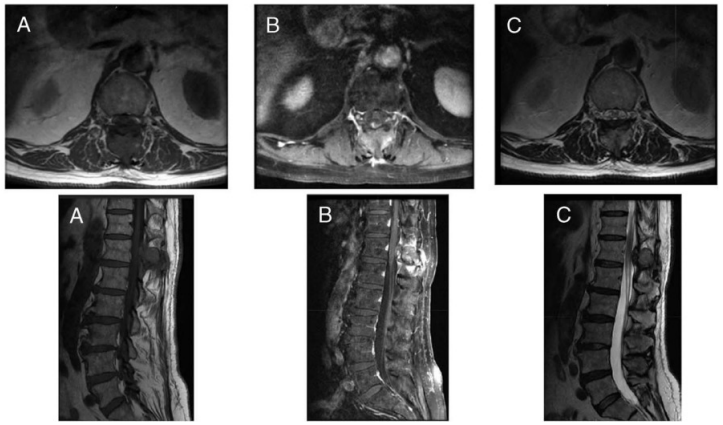


FIGURE 3. T1 (**A**), T2 (**B**), and T1 fat-saturated (**C**) sequences axial and sagittal CT images demonstrate osseous metastatic lesions within the posterior elements of L1 with cortical breakthrough and invasion of the adjacent soft tissues, as well as the posterior epidural space at this level.

Differential diagnosis

- Bone metastasis
- Osteomalacia
- Fibrous dysplasia

Clin Nucl Med. 2022;10.1097/RLU.0000000000004034.

Back to the patient

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A 73-year-old man, asymptomatic

was referred to endocrine clinic for evaluation of abnormal bone scan images

History:

- 2 years PTA: isolated elevation of ALP (from annually routine checkup)
- Asymptomatic, no medication use
- No abnormal finding from ultrasonography of the abdomen and CT of the chest and abdomen

LFT	9/9/2020	28/1/2021
AST (5-34)	28 U/L	32 U/L
ALT (0-55)	23 U/L	27 U/L
ALP (40-150)	508 U/L	520 U/L
GGT (12-64)	75 U/L	66 U/L
Total protein (64-83)	74.9 g/L	68 g/L
Albumin (35-50)	40.4 g/L	38.1 g/L
Total bilirubin (0.2-1.2)	0.9 mg/dL	0.5 mg/dL
Direct bilirubin (0.0-0.5)	0.4 mg/dL	0.2 mg/dL

A 73-year-old man, asymptomatic

History:

- Then he was referred to GI clinic for further investigations

Ultrasound of upper abdomen:

- normal size and parenchymal echogenicity of liver. No focal lesion.
- 0.4 cm gallbladder polyp
- 3.1 cm and 1.2 cm renal cyst at lower pole of left kidney

A 73-year-old man, asymptomatic

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investigations

Laboratory result		
Ca / CCa	9/9.1	mg/dL
PO_4	3.5	mg/dL
Albumin	3.8	g/dL
Heat stable ALP isoenzyme	4	%
25(OH)D	49.20	ng/mL
PSA	0.847	ng/ml

CT chest and mediastinum

- Subpleural nodule at basal RLL 1x1cm (follow up : decreased size to 0.7 cm)
- Consult pulmonologist: likely benign-> plan follow up
- No lymphadenopathy
- Normal thyroid
- Unremarkable visible abdomen
- Seen degenerative change of spine

A 73-year-old man, asymptomatic

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investigations

Skeleton plain film

- Sclerotic change at L1, L5 vertebra, sacrum and bilateral pelvic bone

A 73-year-old man, asymptomatic

Diagnosis: Paget's disease of bone

Management: Zoledronic acid 5mg IV at March, 2021

LFT	9/9/2020	28/1/2021	21/6/2021	1/11/2021
ALP (40-150)	508 U/L	520 U/L	95 U/L	66 U/L