

Primary bone tumors  
Tumeurs osseuses primitives  
Primitive bottumors



Majority of these tumors occur in childhood and adolescence

- High level of metabolic activity -> profound osteoblastic response  
->increased uptake of tracer
- Highly vascular: vascularity helps to delineate tumor size
- Local flush also noted in benign lesions: osteoid osteoma, ossifying fibroma (osteofibrous dysplasia)
- No uptake found in simple bone cyst
- Benign tumors: margins are clearly delineated

## Benign tumors

- Non ossifying fibroma: radiologically confined to the cortex  
mild or no increase at bone scan
- Ossifying fibroma (osteofibrous dysplasia):  
intense (though non specific) uptake on bone scan (generally  
localized in the cortex of the tibia)
- Enchondroma: formation of hyaline cartilage within bone  
(frequent: tubular bone of the hands). Can transform into  
chondrosarcoma
- Osteochondroma: metaphysis of long bones : projection covered  
with cartilage on external surface of bone, relatively mild uptake  
no vascular response
- Chondroblastoma: epiphysis of long bones, rare (1% of bone tu)  
mild scintigraphic uptake
- Giant cells tumor: frequently found around the knee, prox humerus  
Present with active uptake of tracer surrounding photopenic areas

Scan does not differentiate between be and ma tumor

Osteoid osteoma (frequent: 14% of benign tumors)

Pain occurring at rest, relieved by PG inhibitors (aspirine)

Bone scintigraphy mandatory (especially if radiological difficulties:  
spine, small bones)

Negative bone scan excludes the diagnosis

RX: lucent nidus surrounded by sclerosis

Bone scan: intense focus of uptake in the nidus (interest of intraoperative  
probe: precise localization and ensure complete excision)

## Malignant tumors

Osteogenic sarcoma (osteosarcoma) (metaphyseal region of tubular bones)

Localized pain, swelling, loss of adjacent joint mobility

Increased vascularity

Poor definition of the margins of lesion at bone scan

Metastatic spread (osseous and extraosseous: lungs) not infrequent

Ewing's sarcoma (diaphysis of tubular bones)

Intense accumulation with homogenous distribution, margins poorly delineated

Frequent metastatic spread

Chondrosarcoma (primary or secondary tumor arising out of Enchondroma)

Radiopharmaceutical uptake moderate to high, outlines mildly distorted

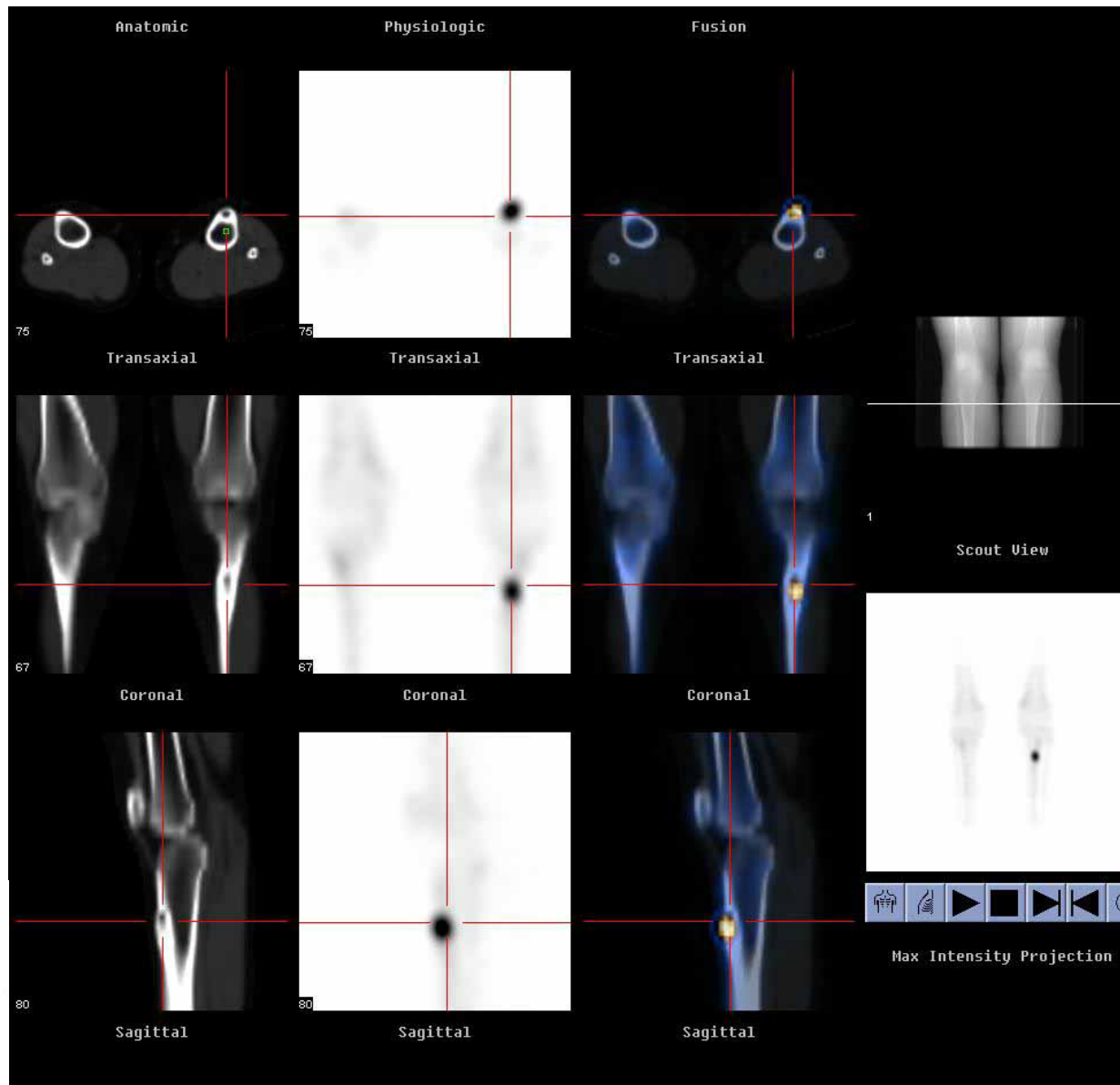
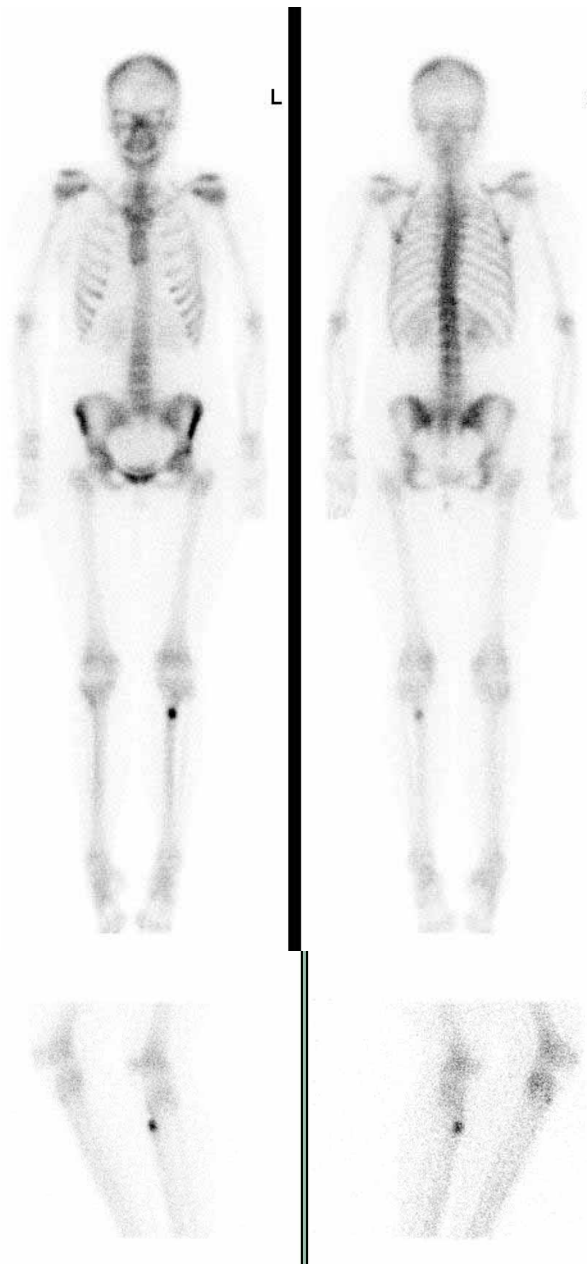


Coronal slices of pelvis showing an osteoid osteoma of right hip (arrow)  
In case of surgery, the lesion can be precisely located by a probe



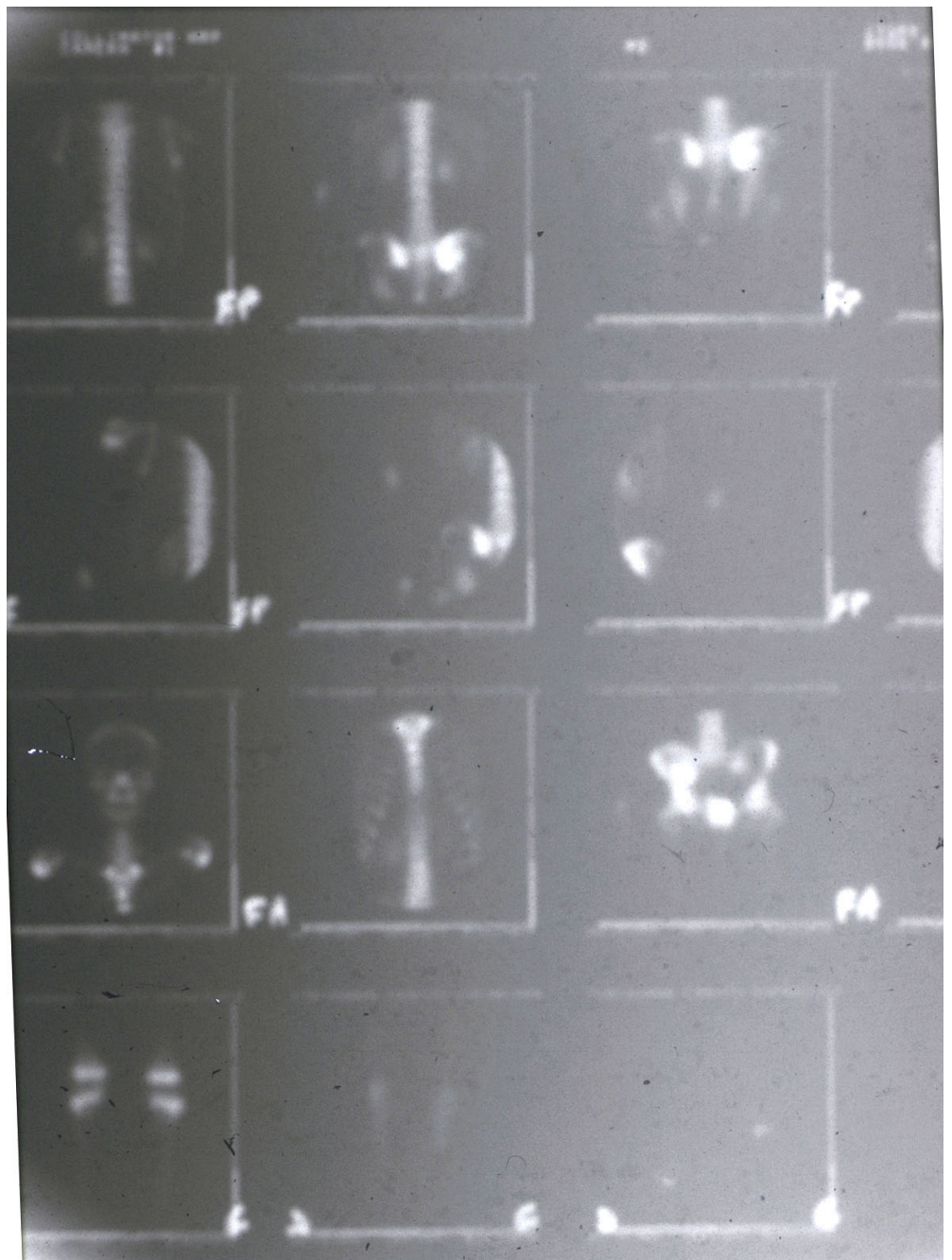
Ewing's sarcoma

12 years old girl complaining from right knee pain  
 A primary tumor of the right tibia was found,  
 Corresponding to an ossifying fibroma.  
 Differential diagnosis with Ewing  
 sarcoma was not possible on the basis of bone scan

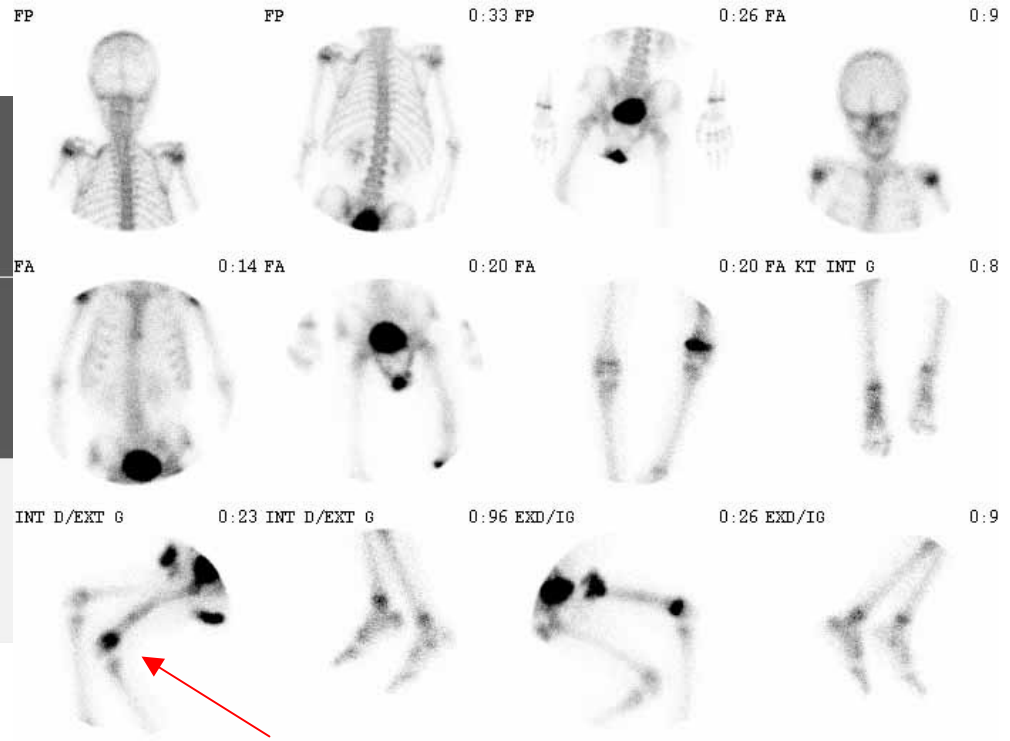
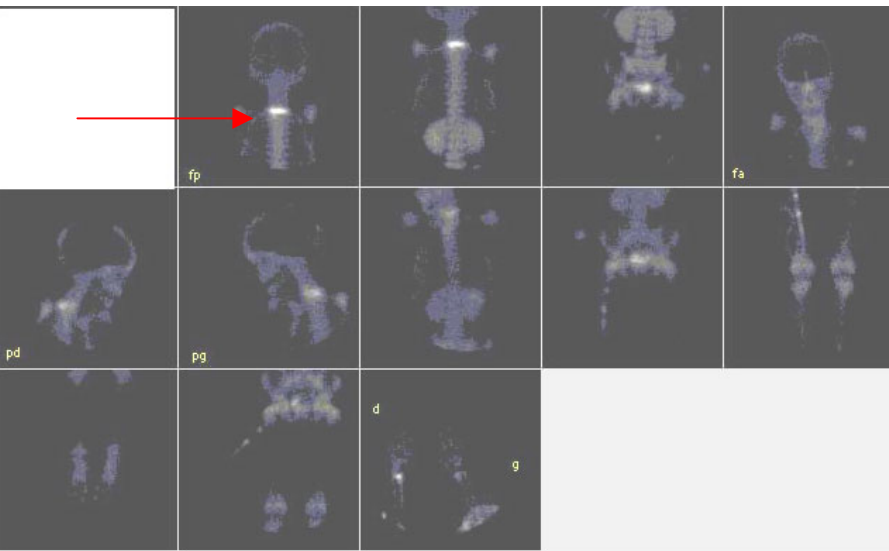


## Ossifying fibroma of the left tibia

Left: standard imaging, right: fusion SPECT/CT



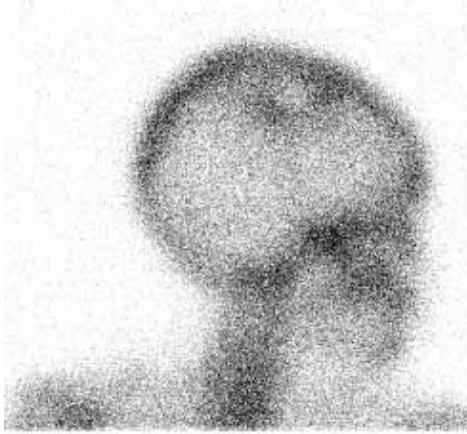
Ewing's Sarcoma of the right part of the pelvis



Ewing's sarcoma of second dorsal vertebra

(09 2002). Chemo/Radiotherapy

Development of metastases (11 2004) (left femur), note involvement of metaphyses



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GAUCHE



Eosinophilic granuloma

Note the lytic central area  
surrounded by important  
osteoblastic response

No other suspect lesions  
were found

Same pattern can be observed  
in histiocytosis X