Three year-old male
Left eye proptosis, fever, headache

Isabel Roca
HU Vall Hebron
3 y old male. Left eye proptosis, fever, headache

**April 2010**: emergency room

- **Cranial US**: retrobulbar mass
- **Abdominal US**: left SR tumor

Left SR mass 2,3 x 3,8 cm

Abdominal US - April 2010
3 y old male. Left eye proptosis, fever, headache

April 2010:
- Bone scintigraphy:
  - Blood pool images
  - 2 hour bone images
- $^{123}$I-MIBG
- MRI
- PET-FDG
- Bone marrow +

Bone Scintigraphy
$^{99m}$Tc-DPD – Blood pool images - April 2010
Case 1
3 y old male. Left eye proptosis, fever, headache

April 2010:
- Bone scintigraphy:
  - Blood pool images
  - 2 hour bone images
- $^{123}$I-MIBG
- MRI
- PET-FDG
- Bone marrow +

Bone Scintigraphy
$^{99m}$Tc-DPD – 2 h bone images - April 2010
TEACHING POINT

INCREASED UPTAKE IN BLOOD POOL IMAGES = BONE OR BONE MARROW METASTASIS

Sometimes the BM metastasis are better seen in blood pool images.

See vertebrae !!!

Blood pool images

Bone images
3 y old male. Left eye proptosis, fever, headache

**April 2010:**
- Bone scintigraphy
- $^{123}$I-MIBG:
  - tumour uptake
  - multiple bone mets
  - soft tissue mets
  - high uptake
- MRI
- PET-FDG
- Bone marrow +

18 hours post-injection - April 2010
BEFORE TREATMENT ONLY approx. 50% OF NEUROBLASTOMA SHOW BONE SCAN UPTAKE

Bone scan uptake of NBL tumor can be due to Ca++ deposits
April 2010:

- Bone scintigraphy
- $^{123}$I-MIBG
- MRI:
  - huge left SR Tm
  - left retrobulbar Tm
  - bone mets
- PET-FDG
- Bone marrow +
April 2010:

- Bone scintigraphy
- $^{123}$I-MIBG
- MRI
- PET-FDG:
  - Tm high uptake (borders)
  - multiple bone mets
- Bone marrow +

$^{18}$F-FDG

April 2010
**TEACHING POINT**

**DISCORDANCIES BONE SCAN – MIBG
....AND WITH PET-FDG ...AND WITH MRI**

**CORRELATIVE IMAGING:** anatomic and metabolic images together!

**CORRELATIVE IMAGING** is our best trick to help the clinician in patient management

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3 y old male

NEUROBLASTOMA stage IV

23.04.10: Chemotherapy

• HR-NBL-1/ESIOP/COJEC-CURS A

7 cycles between 23.04.10 and 22.06.10

• well tolerated
3 y old male. NEUROBLASTOMA stage IV

July 2010:
- PET-FDG

18F-FDG
July 2010
3 y old male. NEUROBLASTOMA stage IV

PET-FDG
Comparison pre-post chemotherapy:

April/10
July/10

$^{18}$F-FDG
3 y old male. NEUROBLASTOMA stage IV

July 2010:
- $^{123}$I-MIBG
3 y old male. NEUROBLASTOMA stage IV

\(^{123}\text{I}-\text{MIBG}\)

Comparison pre-post chemotherapy:

April/10  

August/10
3 y old male. NEUROBLASTOMA stage IV

July 2010:

- MRI left SR Tm marked reduction
- less and smaller bone mets
3 y old male. NEUROBLASTOMA stage IV

**July 2010:**
- MRI retrobulbar Tm nearly disappear

MRI Comparison pre-post Chemotherapy
April 2010
3 y old male. NEUROBLASTOMA stage IV

SUMMARY - POST-Chemotherapy evaluation:

- PET-FDG: 2 metabolic lesions, right lung
- MIBG: completely normal
- MRI: improvement of residual mass
- Less and smaller but persistent bone mets
3 y old male. NBL stage IV

What to do?

LUNG FDG+ DIPOSITS

1. Right lung biopsy
2. Clinical evaluation
3. Nothing
4. Thorax CT
5. Antibiotic treatment

SUMMARY - POST-CHT evaluation:

• PET-FDG: 2 metabolic lesions, right lung
• MIBG: completely normal
• MRI: improvement
  residual mass
  Less and smaller but persistent mets
3 y old male. NBL stage IV

What to do?

LUNG FDG+ DIPOSITS

1. Right lung biopsy
2. Clinical evaluation: fever and cough the days before PET-CT
3. Nothing
4. Thorax CT 5 weeks later
5. Antibiotic treatment

SUMMARY - POST-CHT evaluation:
- PET-FDG: 2 metabolic lesions, right lung
- MIBG: completely normal
- MRI: improvement
  - residual mass
  - Less and smaller but persistent mets
3 y old male. NEUROBLASTOMA stage IV

- After AB treatment
- Thoracic CT
  18/aug/10
  improvement
Case 1

3 y old male. NEUROBLASTOMA stage IV

- After AB treatment
- Thoracic CT

18/aug/10 improvement

INTERCURRENT LUNG INFECTION
- Improvement with oral AB treatment
- Thorax CT 1 m later: improvement
3 y old male. NBL stage IV

**What to do ?**

**BONE AND TM RESIDUAL MRI LESIONS**

1. Repeat bone or tumor biopsy
2. Nothing
3. There is residual viable tumor, new ChT treatment
4. There is no residual viable tumor.

**SUMMARY - POST-CHT evaluation:**

- PET-FDG: 2 metabolic lesions, right lung
- MIBG: completely normal
- MRI: improvement

  residual mass

Less and smaller but persistent mets
3 y old male. NBL stage IV

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