Primary Pulmonary Primitive Neuroectodermal Tumor (PNET) - A Case Report

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INTRODUCTION

Primitive neuroectodermal tumor (PNET) is a rare tumor, classically described under small round blue cell tumors with neuroectodermic differentiation and developing out of the nervous or the sympathical system. Current evidence indicates that both Ewing's sarcoma and PNET have a similar neural phenotype and, because they share an identical chromosome translocation, they should be viewed as the same tumor, differing only in their degree of neural differentiation.

The statistic shows :
- less then 1 % of the sarcomas
- before the age of 35 (75 % the cases)
- pic of frequence between 15-20 years
- localisation: thorax (44 %), abdomen-pelvis (26 %), members (20 %), head (6 %)

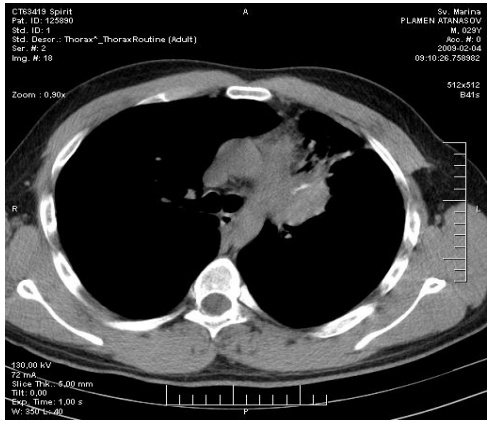
Diagnostical anatomopathological and clinical criterias: (fig.1)
- *morphology:* small round blue cell tumors (with or without rosettes)
- *immunohistochimistry:* CD99 (3 antibodies: HBA71, O13, 12E7) against the product of the gene MIC2 ; in more then 90 % of the PNET
- *genotype:* translocation t(11;22)(q24;q12) in 88 % of the cases being a real cytological marquer (rarely t(21;22)(q22;q12)). That translocation can be detected also by PCR (detection of EWS-FLI1 in 95% of the cases or EWS-ERG, rarely EWS-ETV1)
- *phenotype:* the neuroectodermic type shown by the next antibodies : synaptophysine, chromogranine, proteine S100, NSE, LEU7, GFA

After the second course of chemotherapy (2 months latter), there was a tight degeneration of the general condition of the patient - he was easely tired, there was no more hoemopthisis, the thoracic pain was still there and we added Oxicodone 10 mg.

The CT-scan (31.10.2008) showed a decreasing of the sagittal dimension on 50% and of the transversal one on 36%; there was one secondary lesion with the characteristics of an inflammation or atelectasis

Unfortunately in the beginning of 2009 the clinical examination and the complementary results presented a progression on lung and bone level.

CT-scan (02.09) - on left there was a mass 70/34 mm on left (fig. 3) in the region of the superior bronch, decrease of the volume of the left lung, axillary's lymphadenopathy, induration of the pleura and paravertebral mass on left, infiltrating the rip, hypodense lesions of the thoracic vertebras - metastases.



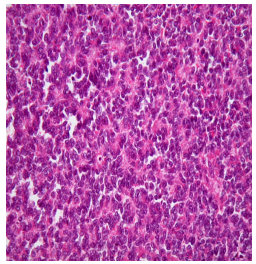


Figure 1. Histology of pulmonary PNET

The clinic is not typical. Usually the pain is the first symptom with the founding of a tumour mass. Most of the cases are diagnosed in advanced stages:
- general symptoms (fever, anemia, lost of weight)
- pathological fractures
- metastases - lung (50 %), bones (25 %), spinal cord (20 %), liver and brain
The clinical evolution is fast (less then 1 year), usually with some pain (1/3 of the cases) predicted by the localisation and the seize of the tumour

Factors of bad prognosis:
- the presence of metastases in the moment of the diagnosis
- the seize of the tumour (seize > 8 cm or a volume > 100 mL)
- axial development then periferic one
- presence of chromosal aberration or transcription of FLI1/EWS
It seams that the complete chistologiqual answer of the neoaduvant chimiotherapy is the most important factor

CASE REPORT

We present a 29 years old man with a thorax pain, hoemoptisis, and dry caught from March 2008. Because of that plaints he was hospitalized in the Pneumology department of The University Hospital "St.Marina"-Varna. The radiography and the CT-scan showed one hillier mass in the left lung. A fibrooptic bronchoscopy made in Central Hospital Robert Ballanger in Paris, France showed hypervascular mass closing the superior lobe in left and infiltration in more then 2 cm from the carina. The histological and immunological results were positive for PNET.

RESULTS

Figure 3: Lung CT-scan - progression

The chemotherapy was stopped and the dose of the opiates increased - Oxicodone 3x20mg and Fentanil TTS 75 µg

In March 2009 the patient arrived by emergency presenting tiredness, loose of sensation of the legs and constipation from 28.02.09. He was not able to move his legs; there was a pain on the thorax which was limiting the movement of the hands and the respiration. On the neurosurgical consultation there was missing of abdominal reflexes, distal type of anesthesia on level Th 5-6, a lost of deep sensation.

The MRI (fig 4) showed bone metastases on Th 5,6,9,11,12 and L1, the one on Th5 was having extradural extension and was provoking a total compression of the spinal cord on Th 5-6 and extension to the neuroforamens of Th 4-5, the rips and the paravertebral tissue.

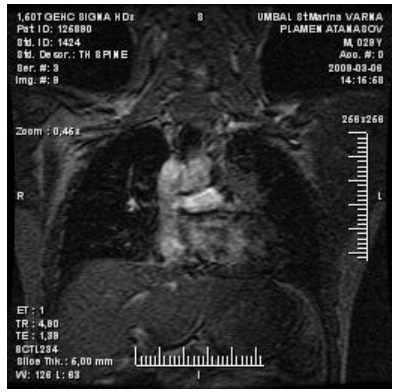


Figure 4: Thorax MRI after the agravation

The patient was inoperable. We used symptomatical treatment with corticoids, Mannitol 10% 500ml, Morphine 3x1 sc, Furosemide, Omeprazol. After a tight amelioration of the general condition the patient was recieving home palliative care .

CONCLUSIONS

1. Primitive neuroectodermal tumor lesions are aggressive and usually lethal

The bone scan (08.07.2008) showed one bone metastase at Th5-6 and traumatical hyperfixation on the ribs 7-8 on right.

The CT-scan (10.07.2008) showed one hillier mass 11-8-6,8 cm in contact with the superior bronchi on left and the mean vessels; there were no secondary lesions in the abdomen, nor in the brain.

The MRI (16.07.2008) was giving evidence of one metastase on Th5 and suspections at Th9 and Th11. (fig.2)

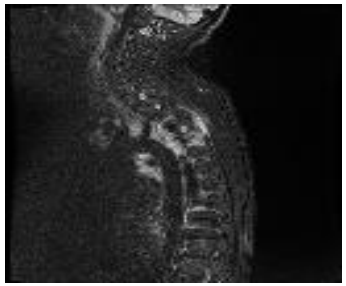


Figure 2: Thoracic MRI before treatment

The decision was for systematic chemotherapy. The symptoms treatment was by Paracetamol or Nimesulide in case of need.

Chemotherapy: repeated every 43 days
Doxorubicin 20 mg/m2 d3
Vincristin 1.5 mg/m2 d 1 and 22
Etoposid 150 mg/m2 - d1,2,3 and d21,22,23
Ifosfamid 2 g/m2 - d1,2,3 and d21,22,23
Mesna 400 mg 0,4 and 8 h
Actinomicin D 0.5 mg/m2 d21,22,23

Bifosfonate every 28 days

2. PNET should be considered in the differential diagnosis of thoracic tumors

3. PNET were primary described in childhood but are considered rare in adults

4. PNET present clinical polymorphism and any specificity
5. The diagnosis is difficult and relies on the immunohistochemistry and the cytogenesis of the tumor

6. The treatment is still not standardized

7. The surgery is predominant

8. The principal treatment is Doxorubicin-based chemotherapy

9. For the high risk tumours the general survival is ameliorated by the use of Anthracycline and Ifosfamide

10. The trials show that the efficace medicaments in the treatment are: Vincristine, Actinomycine, Cyclophosphamide, Ifosfamide, VP16, Adriamycine

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