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Management of Medulloblastoma Metastases: Algerian Experience

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ABSTRACT

This work is based on the study of patients treated for medulloblastoma metastasis at diagnosis between January 2006 and December 2015 in the neurosurgery department of the Ait IDDIR Health Hospital Establishment.

Our series consisted of 16 patients, 11 men and 5 women; the median age was 16.9 years. The baseline, presentation of symptoms and signs, imaging results (MRI), surgical results and clinical results were recorded. The clinical manifestation was revealed by intracranial hypertension syndrome (100%), associated with cerebellar syndrome (80%).

The localization was in Intra-nevraxics: (81.25%) and in Extra-nevraxics (18.75%). 68.75% of patients underwent total surgical excision and 31.25% underwent subtotal surgical excision. The presence of malignant cells in the CSF is marked in 56.25%. The pathological study revealed that 62.5% of cases had a classic variant and 37.5% a desmoplastic variant. 30% of the cases were classified as "standard risk" and 70% as "high risk". The surgery was supplemented by radiotherapy of the entire neuraxis using the "movable junctions" technique in all cases. The average delay was 70 days. Adjuvant chemotherapy was performed in 9 cases. The long-term survival rate after metastasis varies between 06 months to 24 months, only 04 cases (25%) are still alive.

The management of medulloblastoma must be multidisciplinary involving neurosurgeons and radiotherapist oncologists. This collaboration is the only guarantee of an improvement in his prognosis.

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Introduction

Medulloblastoma is a brain tumor of embryonic origin that is common in children (15 to 20% of all brain tumors) and rarer in adults (1% of brain tumors) [1-3]. His prognosis, once consistently fatal within months, has been improved by advances in neurosurgery, resuscitation and radio / chemotherapy.

It is a tumor that has intranevraxic and more rarely extranevraxic metastatic potential [1]. These metastases form the bulk of our presentation.

Material and Methods

This is a serie of 16 cases of metastases out of 135 cases of medulloblastoma operated on in our neurosurgery department of the AIT IDDIR Health Hospital Establishment, over a 10-year period from January 2006 to December 2015. The baseline, presentation of symptoms and signs, computed tomography (CT) results, operative results, and clinical results were recorded.

For all the patients, the diagnosis was made after surgery. All patients received the adjuvant treatment.

Results

Between January 2006 and December 2015, we had 135 cases of meduloblastoma, 16 (11.8%) patients had metastasis, 11 (70%) patients were males and 5 (30%) were females (Figure1a). The mean age was 16.9 years (ranged 3 –48 years) (Figure1b).

Clinical manifestations of medulloblastoma metastasis vary widely according to the location. The most frequent clinical manifestations found were intracranial hypertension syndrome (100%) and static and kinetic cerebellar syndrome (80%).

The imagery had shown that there were 13 (81.25%) intra-nevraxic localizations: 12 cases at the leptomeningeal level and 01 cases at the basi-frontal level, and 03 (18.75%) Extra-nevraxic localizations pulmonary, subcutaneous, peritoneal) (Figures 2, 3).

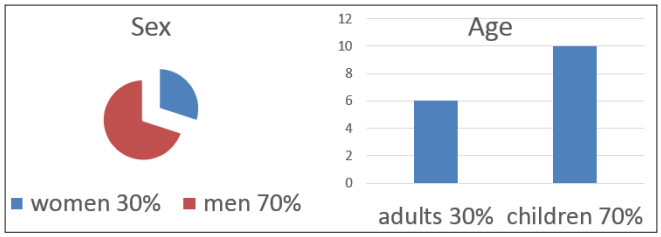
All our patients have benefited from a ventriculo-peritoneal derivation and then operated on for Cerebral Fossa Posterior, the

quality of excision was total in 11 cases (68.75%) and subtotal in 5 cases (31.25%) (Figures 2B). The presence of malignant cells in the CSF was noted in 09 cases (56.25%).

According to tumor pathology, ten patients (62.5%) had a classical variant; six (37.5%) patients had a desmoplastic variant.

Regarding the discovery of medulloblastoma metastases, we noted the presence of metastasis at the time of diagnosis in 2 cases (12.5%), 14 cases (87.5%) postoperatively: with a delay of 02 months to 03 years (average of 19 months). Delayed adjuvant therapy has been initiated for early metastases, adjuvant therapy was based on radiotherapy and chemotherapy; for other metastases, this adjuvant treatment was initiated after tumor recurrence. 03 cases (18.75%) of metastases were operated on: (medullary, basi-frontal, subcutaneous)

Long-term survival rate after metastasis: 06 months - 24 months, only 04 cases (25%) are still alive.



a **b**

Figure 1: Distribution of medulloblastoma metastases by sex (a) and age (b)

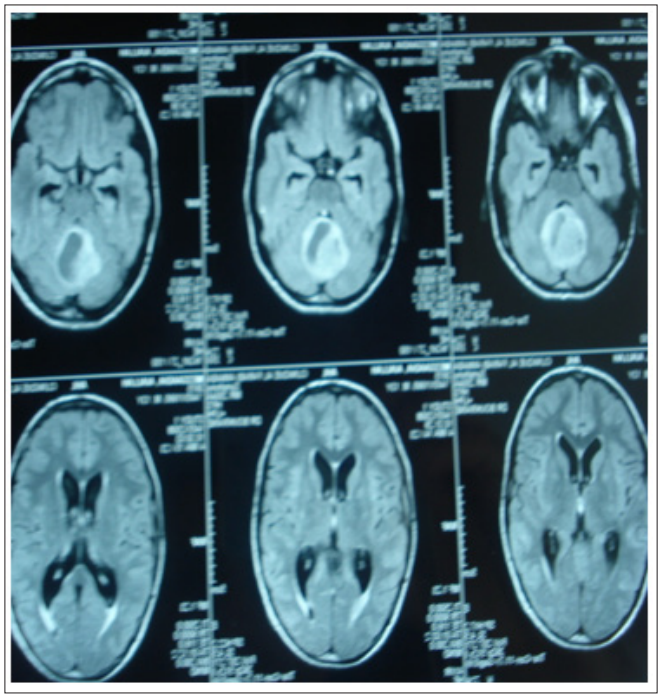


Figure 2 A: Preoperative Brain MRI Magnetic resonance image of a typical medulloblastoma of posterior cerebral fossa. T1-weighted axial section showing a large mass with heterogeneous contrast enhancement, appearing in the vermis and pushing back the brainstem forward.

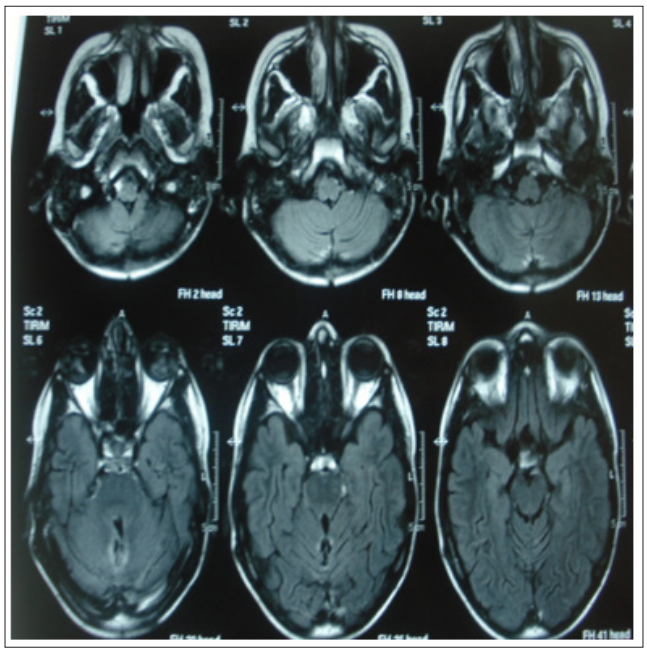
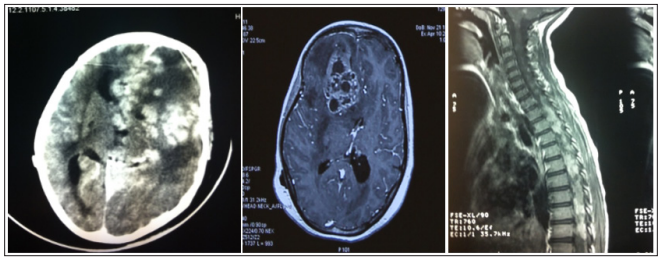


Figure 2 B: Postoperative Brain MRI
Axial T1 section shows a residue <1.5 cm^2



A **B** **C**

Figure 3: localization of medulloblastoma metastases

Cerebral CT of multiple localization cerebral metastasis and leptomeninge infiltration Axial Section of a Brain MRI
In T1-weighted image with injection we find localization of a metastasis of a medulloblastoma with necrotic and cystic components, intense and heterogeneous contrast enhancement and moderate peritumoral edema

MEDULAR MRI shows that the Metastatic Leptomeningeal Extension is Intracranial and/or Spinal Intracanal axial and sagittal views of MRI with medullary localization = medullary infiltration. Contrast enhancements can be "pinhead" millimeter. Craniospinal MRI by thin sagittal slices on the spine in T1 weighting after gadolinium,

Discussion
During the last 30 years, the therapeutic advances concerning malignant tumors are impressive (leukemia, breast cancer)

This is unfortunately not the case for brain tumors, particularly high-risk medulloblastoma, where approximately 50% of metastases are described in the literature at diagnosis [4]. This metastatic character is included in the classification of patients into risk groups: standard risk and high risk.

More common in children (75%) with predominance of men [5].The postoperative delay for metastases in the literature is approximately 18 months [6].

Metastases can be localized in the central nervous system via the circulation of malignant cells in the CSF: more frequently leptomeningeal and spinal more rarely supratentorial (fronto-basal ++) (Figures 3 A, B, C)

More rarely in extra-neuraxis: bones, ganglia, peritoneum, liver and lung. This dissemination, according to most of the authors, is by hematogenous or lymphatic route.Propagation via the bypass shunt is described [1,2].

The quality of excision: Surgical excision is essential for the pathological diagnosis and as the first phase in the treatment of high-risk medulloblastoma. It must be radical whenever possible, and according to some authors it would delay the onset of metastases [7]. Pathology study shows that the Desmoplastic medulloblastoma has less metastasis than the classic [8].

The great potential of medulloblastoma to spread throughout the central nervous system has resulted in the failure of radiotherapy focused on the posterior fossa. This led to radiotherapy of the entire neuraxis.

Brain and spinal metastases may benefit from focal irradiation. This irradiation is most often carried out using a technique which makes it possible to limit the risks of overdose of the medullary axis and of under-dosage of the subarachnoid spaces. Combination with high-dose chemotherapy has led to lower doses of radiotherapy. The prognosis remains poor, with a survival rate of 0 to 18 months in children after diagnosis of metastasis and of 2 to 24 months in adults [3, 7]. New avenues of research concerning medulloblastoma are expanding, in particular the profiling of the genetic expression of this tumor, which could lead to new therapies [4].

Conclusion

The diagnosis of high-risk medulloblastoma should not be delayed in order to initiate effective therapy before reaching metastasis, which remains a poor prognosis, despite new lines of research which have not yet borne fruit.

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