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Review Article

Head and Neck Rhabdomtosarcoma: Literature Review

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Abstract

Head and neck rhabdomyosarcoma (HNRMS) is exceedingly rare and poorly documented; it is a rare malignant soft tissue neoplasm comprised of cells derived from the primitive mesenchyme. About 35% of RMS arises in the head and neck, are classified as parameningeal and non-parameningeal forms. These are the most common soft tissue sarcoma of the children, adolescents and young adults. Their etiopathogenesis and its molecular relevance have been emphasized. The first line of treatment is radical excision and this is usually supplemented by radiotherapy. It is believed that adjunct combination chemotherapy may greatly improve the prognosis. Inadequately treated tumours grow in an infiltrative manner and recur in a high percentage of cases. Bone does not constitute an effective barrier to the growth of the tumour and bone invasion is a frequent finding in head and neck rhabdomyosarcomas.

Keywords: Rhabdomyosarcoma, head and neck, malignant tumor.

INTRODUCTION

Rhabdomyosarcoma (RMS) is a malignant tumor of mesenchymal origin with more or less marked striated muscle differentiation, of unknown etiology. It is a tumor of young children in adolescents, rare in adults.It can develop anywhere in the body, but. The most frequent sites are the head and neck for a frequency of (40%) followed by the location, genitourinary (20%), the limbs (20%) It is a tumor of high degree of malignancy that stands out other sarcomas by its locoregional aggressiveness, its metastatic evolution and its unfavorable prognosis whatever the treatment undertaken. The diagnosis is made only after histological examination. The management is multidisciplinary combining surgery, chemotherapy and radiotherapy.

1. EPIDEMIOLOGY AND ETHIOPATHOGENY

A. GENERAL EPIDEMIOLOGY

The annual incidence of rhabdomyosarcomas in people under 20 years of age is 4.3 cases per million.RMS is the third solid tumor in children after neuroblastoma and nephroblastoma Nasosinus localization represents 50% of childhood RMS In Africa, there is little epidemiological data available on rhabdomyosarcoma. 2 studies were carried out in the pediatric hemato-oncology service of the children's hospital in Rabat, the first on cancers carried out on 183 patients between the years 1986 and 2000, and which showed that rhabdomyosarcoma constituted 5% of all cancers in this unit, the second carried out between 1995 to 2008 on RMS and which showed the same percentage.

B. SEX RATIO

In 70% of cases, rhabdomyosarcomas occur during the first decade of life with an average age of 6 years and two different peaks of ages: in children under 5 and in adolescents. It is slightly more frequent in boys with a sex ratio that varies between 1.4 and 1.7.

C. ETHIOPATHOGENY

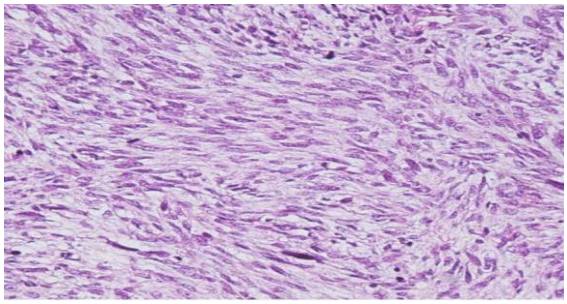
The etiology of RMS is unknown due to the difficulty in correlating predisposing factors with low incidence events. In children, it usually presents as a sporadic disease, but it can also present related to hereditary conditions such as neurofibromatosis type 1 or to Li-Fraumeni syndrome where family members of affected children have a frequency increased other types of malignant neoplasms, such as breast cancer, brain

tumors, including glioblastoma, acute leukemia, adrenal cortex and soft tissue sarcomas. This syndrome is due to the autosomal dominant inheritance of a mutation in the p53 protein gene which predisposes to developing these malignant tumors; For the adult population, no studies have been published concerning the etiology of rhabdomyosarcoma.

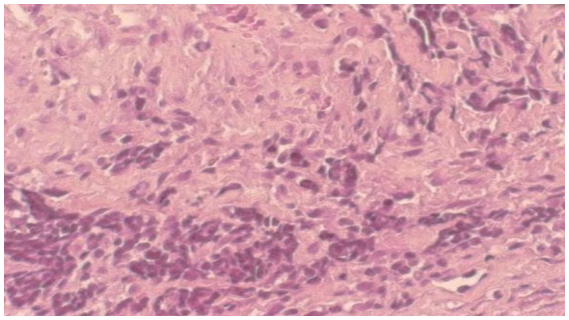
2. ANATOMOPAHOLOGY

A) HISTOLOGICAL TYPES

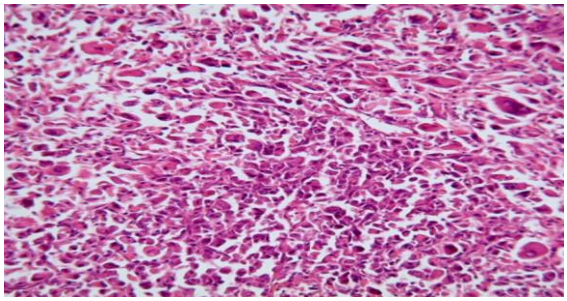
RMS are highly aggressive malignant mesenchymal tumors that arise from immature cells intended to form skeletal striated muscle. The characteristic cells of this tumor are the rhabdomyoblasts, slightly elongated cells with intracellular crossed streaks and eosinophilic cytoplasm. The RMS is divided into two main forms: the embryonic and alveolar RMS in addition to a 3rd type which is the plemorphic form this classification was secondarily completed by the identification of subtypes within the large groups the botryoidal RMS and Spindle-shaped cells are variants of the embryonic form.



Spindle cell rhabdomyosarcoma (HESx20cell)



Alveolar rhabdomyosarcoma (HESx20)



Pleomorphic type rhabdomyosarcoma (HES x20)

HISTOPRONOSTIC CORRELATION

Currently, after confronting the classifications proposed by the Intergroup Rhabdomyosarcoma Study (IRS), the international society of pediatric oncology (SIOP), the National cancer Institute (NCI). This so-called international classification has made it possible to highlight a histopronostic correlation allowing a more appropriate treatment.

IMMUNOCHEMISTRY

The immunohistochemical study is decisive in the diagnosis. RMS expresses Vimentin, testifying to the conjunctival origin of cell proliferation, smooth muscle actin (AML) of striated muscle, desmin testifying to an intermediate filament between smooth and skeletal muscles. (Cytoplasmic expression most often diffuse regardless of the histological subtype) and myogenin (nuclear expression). Myogenin expression differs between subtypes and constitutes a good element of histological classification

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3. STAGING

2 classifications systems are used: the international SIOP "TNM" system (tumor, lymph node, metastasis, international) which is based on the description of the tumor before any treatment (clinical stages); the American "IRS" system (Intergroup RMS Study, United States) which essentially takes into account the operability of the tumor. The purpose of classifications is to divide tumors into categories that share the same prognosis and should be treated the same. It is also a way to compare the therapeutic strategies of different teams on groups of patients characterized without ambiguity.

4. HEAD AND NECK RMS

Rhabdomyosarcoma occupies less than 1% of all head and neck cancers.The ENT location constitutes approximately 40% and comprises three sites:

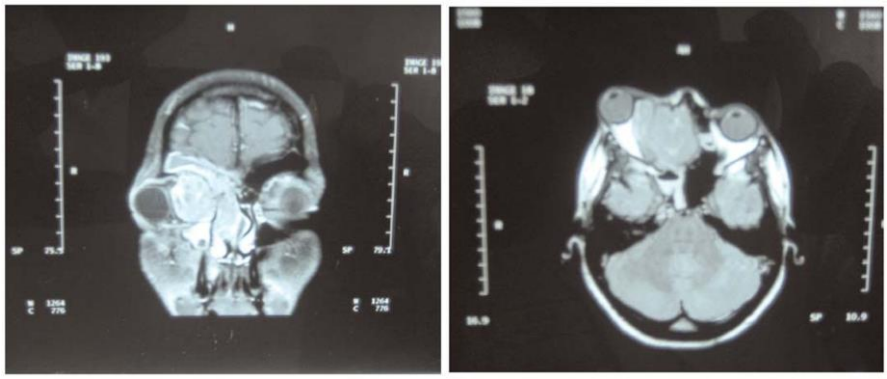
- Non-orbital non-parameningic (parotid, oral mucosa, oropharynx….) 25%
- Parameningee (nasopharynx, middle ear, sinuses, infra temporal fossa and pterygopalatine) 50%
- Orbital region 25%

Description type

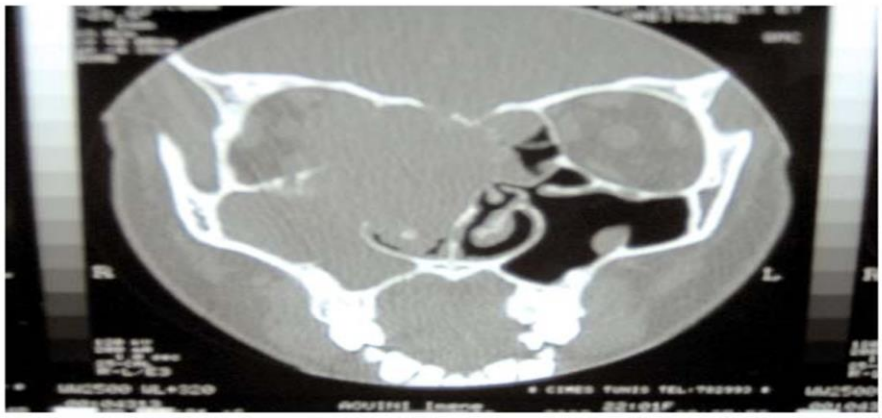
Nasosinus RMS in children

Among the most frequent localizations in ENT we have nasosinus rhabdomyosarcoma which represents 50% of rms in children. It has no precise symptomatology but most often we find:

- Chronic nasal obstruction
- repeated epistaxis
- Purulent rhinorrhea
- Chronic headache
- Swelling of the wing of the nose ....
- Aspect of PNS a l EN



MRI of the facial mass showing the tumor invading the frontal ethmoido structures; the FN and right maxillary sinuses pushing back the eyeball



CT scan of the facial mass in coronal section bone window showing an orbital RMS dt invading the riddled blade the ethmoidal structures the nasal fossa the septum and the maxillary sinus

Clinical forms

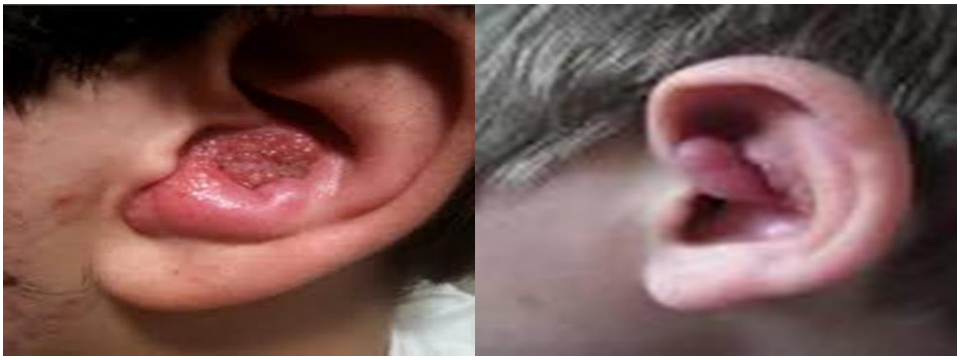
Parotid RMS

Rhabdomyosarcomas of the salivary glands are rare tumors, and are particularly found in the parotid gland. Swelling of the parotid region and facial paralysis are the main revealing symptoms. It is characterized by their very rapid evolution and tendency to make pulmonary metastases; hepatic or bones.

Ear RMS

Among the localization of rhabdomyosarcoma in ENT we can have an attack of the outer ear which is less aggressive than rhabdomyosarcoma of the middle ear. Auricular localization, has no clinical specificity it can present in the form of a

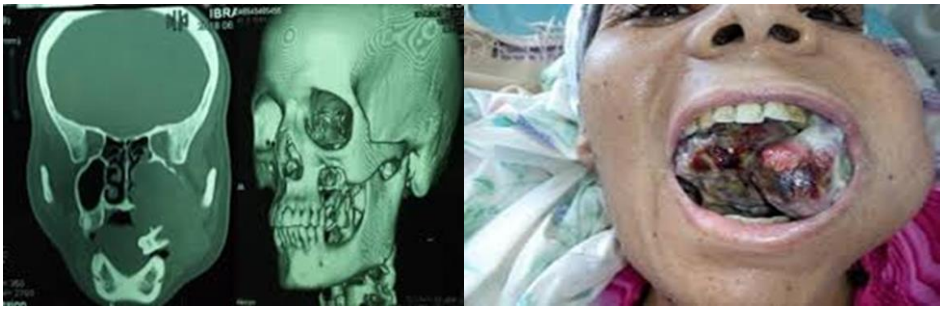
- Unusual swelling of the pavilion
- Hearing loss
- Purulent otorrhea
- Otoscopic appearance of inflammatory polyps



Photos showing the initial clinical presentation of atrial rhabdomyosarcoma in children

RMS of the oral cavity

RMS is very rare in the oral cavity and when it is there, the most affected sites are the palate and the tongue the most common symptoms are pain, paresthesia, trismus, facial asymmetry, discomfort functional to eating, speaking or breathing.



Aggressive RMS of the Oral Cavity

5. DIFFERENTIEL DIAGNOSIS

In adults heterologous rhabdomyosarcomatous differentiation is a relatively common phenomenon observed in mesenchymal tumors, such as dedifferentiated liposarcoma and malignant tumor of the peripheral nerve sheath. In addition, it can also be seen less frequently, in other non-differentiated tumors. mesenchymal tumors such as Müller's mixed malignancy (MMMT) or carcinosarcoma, poorly differentiated carcinoma and germ cell tumor In the case of embryonic round cell rhabdomyosarcomas in children, the possibility of other cell tumors should be considered. round, including neuroblastoma, lymphoma, primary peripheral neuro-ectodermal tumor, or synovialosarcoma.

6. TREATMENT

Considerable progress has been made in the management of these tumors thanks to better patient staging and multidisciplinary collaboration involving the ENT surgeon; chemotherapist and radiotherapist. Indications depend on classification; accessibility to the tumor and anapathic finding. The main goal of treating MSR is to achieve local control of the tumor. Indeed, the course of these tumors, when they are not metastatic at diagnosis, is dominated by the risk of local recurrence. In this population, where half of the children are under 5 years of age, the monitoring and prevention of sequelae must be particularly attentive, especially since local treatment can expose sequelae which will worsen over time. growth. The follow-up should make it possible to detect a recurrence in time and to detect the undesirable effects of the treatments. Recurrences are local or locoregional in 70% to 80% of cases. The risk of recurrence decreases a lot beyond the first three years and becomes very low after 5 years following the diagnosis. Monitoring for late complications of local treatment should be ensured for many years, at least until the end of growth. Thanks to this monitoring, the necessary corrective measures can be proposed in good time.

Surgery

Primary surgery is considered for small, easily accessible tumors. The quality of the resection is evaluated by a histological examination of the limits of the surgical specimen. Initial surgery was in the past the approach of choice especially for the IRS group, whose classification system is based on a systematic trial of primary surgery. However, thanks to an effective first chemotherapy, this strategy evolves and most of the European groups only resort to the initial surgery if the CT or MRI imaging shows that the complete resection is devoid of functional and aesthetic morbidity. Initial surgery extended to healthy tissues or organs is no longer acceptable if another strategy can provide comparable long-term survival.

An Italian study carried out by Giovanni et al to analyze the influence of initial surgery (biopsy versus resection with macroscopic residue), on patients with stage III IRS RMS. Among the 394 cases treated, 323 had a biopsy and 71 a surgical resection with macroscopic residue. The results were as follows:

- Overall 5-year survival was 68.4% for biopsy and 72.6% for resection (p = 0.38)
- Recurrence-free survival was 56.5% after biopsy and 61.7% after resection (p = .41).

The results did not change significantly when considering other variables such as the primary site of the RMS, its size and its histology. although for patients over 10 years old, resection appeared to be somewhat more beneficial than biopsy since overall survival was 62% after biopsy and 83.1% after resection (p = .06). Recurrence-free survival was also better, being 49.7% after biopsy and 72.8% after resection. The conclusion is that there is not a significant advantage of resection over biopsy. Biopsy, which is less aggressive, appears to be the best option for stage III IRS patients A re-intervention before starting chemotherapy is justified in the rare cases where the surgeon considers that he can perform satisfactory surgery.

Chemotherapy

Chemotherapy is an essential weapon in the treatment of rhabdomyosarcomas. Currently, most rhabdomyosarcomas are treated with primary chemotherapy in order to control the tumor locally and therefore to limit surgery or additional radiotherapy. Drugs that have been shown to work are actinomycin D, cyclophosphamide, vincristine, cisPlatinum, carboplatin and doxorubicin. Recently ifosfamide and etoposide have been added to the therapeutic arsenal. These products are always used in combination according to the protocols. The duration and intensity of treatment will vary depending on the initial prognosis and response to treatment. The late consequences of chemotherapy depend mainly on the doses received. The most common complications are leukothrombocytopenia, nausea, vomiting, alopecia and which are generally reversible after discontinuation of treatment or after revision of the dosage.

Radiotherapy

The role of radiotherapy is to obtain local control or to consolidate that obtained by chemotherapy. Previously given doses, between 50 and 60 gray, made it possible to control the primary tumor in 90% of cases but often at the cost of severe sequelae and / or unacceptable long-term complications. The doses used in recent studies range from 40 to 45Gy for the control of microscopic disease and 50 to 55 Gy in case of macroscopic residue, with an overprint on a volume possibly reduced by 5 to 10 Gy. There is a consensus that completely resected standard histology tumors have no indication for irradiation. The North American IRS group recommends systematic irradiation at 36 Gy in alveolar forms whose excision has been complete.

7. SURVIVAL AND PRONOSTIC FACTORS

The prognosis of RMS depends mainly on 5 elements:

- **The primitive site**
  - Favorable: damage to the orbit, head and neck not para-meningeal
  - Unfavorable: attacks of the para-meningeal region.

- **Age at diagnosis**
  - Localized RMS: Different studies have shown that patients under 9 years of age and patients over 10 years of age have 83% and 68% failure-free survival, respectively.
  - Metastatic RMS: age at diagnosis is a more important predictive criterion in terms of survival with a more negative result for children over 10 years old.

- **Tumor size**

Several studies find a significant decrease in the survival of children with tumors larger than 05 cm in size.

- **Histological type**

Several studies confirm the unfavorable nature of alveolar MSRs. In localized damage, an event-free survival rate at 03 years of 83% for RMSE and 66% for RMSA ($p < 0.001$) is noted in some studies. Likewise in metastatic diseases a difference in overall survival and without favorable event for RMSE is demonstrated ($p < 0.001$).Within RMSE, two subtypes are identified as having the best prognosis: botryoid and spindle cell with 05-year survival of 88% and 95% respectively, while it was 66% for non-specific RMSE.

- **Remote extension**

In all the studies, the recurrence-free survival at 03 years is strongly correlated with the metastatic status, a rate of 30% for the metastatic stages and 80% for the non-metastatic stages.

CONCLUSION

ENT-localized rhabdomyosarcoma is a rare malignant tumor with a poor prognosis, especially in adults; Locoregional extension is often advanced at the time of diagnosis, especially the forms with basal cranial or metastatic extensions, which makes treatment more difficult. The development of new molecules used in chemotherapy in clinical trials and multidisciplinary management should further improve patient survival in the future

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