FINE NEEDLE ASPIRATION CYTOLOGY OF PARASPINAL RHABDOMYOSARCOMA

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ABSTRACT

Rhabdomyosarcoma(RMS) is an aggressive mesenchymal neoplasm of pediatric age group that mostly occurs in head and neck region. Paraspinal RMS with spinal cord compression is very rare.

A 2 year old male presented with a left lumbar region lump. FNA smears showed features of small round cell tumors which was confirmed on histopathology and immunohistochemistry. The differential diagnosis includes other small blue round cell tumors. The prognosis is dismal despite the aggressive combined therapeutic regimens. Thus early preoperative diagnosis using cytomorphology and its correlation with ancillary techniques like immunocytochemistry will hasten the treatment and clinical course of the patient.

INTRODUCTION

- Rhabdomyosarcoma is a malignant soft tissue sarcoma with skeletal muscle phenotype comprising 50% of soft tissue sarcomas and 5-8% of malignancies in pediatric age group [1]
- RMS mostly affects head and neck (40%), extremities (20%), genitourinary regions (20%) [2]
- The cytomorphology of paraspinal RMS has rarely been described in literature.

CASE REPORT

A 2 year old male presented with a lump in left lumbar region associated with paraperesis and localised pain. **CECT whole spine** revealed a well defined heterogeneously enhancing lesion with non enhancing necrotic area in left paravertebral region extending from L1 to L3 vertebral level.

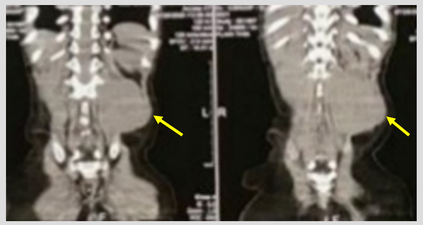

Figure 1. CECT Whole Spine

Fine Needle Aspiration Cytology was performed followed by core biopsy. Later surgical excision of mass and histopathological examination was done.

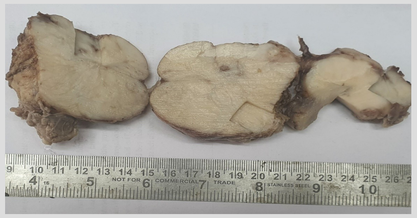

Figure 2. Gross

Received an encapsulated solid mass with excised duramater measuring 8 x 5.5 x 6.5 cm. Cut surface showed homogenous grey white areas along with a necrotic area.

MICROSCOPY

FNA smears were moderately cellular showing few clusters as well as singly lying atypical cells in a hemorrhagic background. Individual atypical cells were highly pleomorphic with round to oval nuclei, high nucleocytoplasmic ratio, coarse clumped chromatin, inconspicuous to conspicuous nucleoli and moderate amount of eosinophilic cytoplasm. Few spindle shaped cells were also seen. Provisional diagnosis of RMS was made.

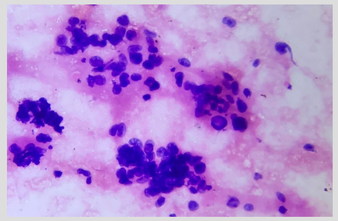

Figure 3. Clusters of pleomorphic small round cells

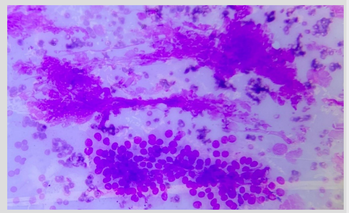

Figure 4. Atypical cells in myxoid background

Histopathology: Hematoxylin and eosin sections from the excised mass showed a mesenchymal neoplasm with pleomorphic cells in a loose, myxoid stroma. Individual tumor cells were small, round to oval and bizzare spindle cells with scant eosinophilic cytoplasm. Few cells have eccentric small oval nuclei with inconspicuous nucleoli. Occasional tumor cells showed rhabdomyoblastic differentiation (tadpole cells) and multinucleation. Excised duramater showed fibroconnective tissue invaded by tumor cells of above described morphology.

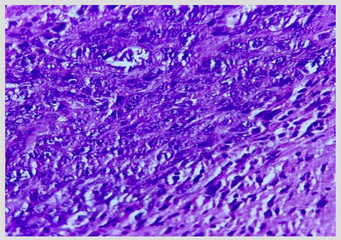

Figure 5. Round to oval, bizzare spindle pleomorphic cells (H&E,20x).

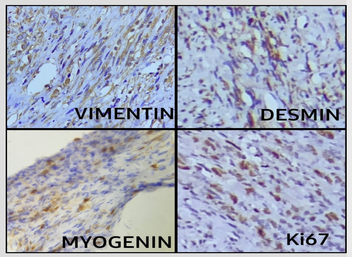

Figure 6. Immunohistochemistry

IHC	RESULT
VIMENTIN, DESMIN	STRONG, DIFFUSE POSITIVE
MYOGENIN	FOCAL POSITIVE
Ki67	20%
S-100, CD99, SYNAPTOPHYSIN	NEGATIVE

Hence, the provisional diagnosis of RMS on cytology was confirmed and subtyped to **Embryonal Rhabdomyosarcoma** on histopathology and immunohistochemistry.

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DISCUSSION

- RMS belongs to the group of small blue round cell tumors that include malignant lymphoma, Ewing's sarcoma, Wilm's tumor, neuroblastoma, peripheral neuroepithelioma and small cell anaplastic carcinoma.
- It is classified into three subtypes based on histopathological features and clinical characteristics: embryonal (classic embryonal, botryoid and spindle cell variants), alveolar and pleomorphic [1]. Embryonal and alveolar RMS mostly occur in children whereas pleomorphic RMS is seen in adults.
- Although paraspinal RMS is rare, the clinician should keep it as a differential diagnosis due to its highly aggressive nature and spread to the spinal cord [3].
- The similar cytomorphology in FNA smears and histological sections (malignant round to oval, pleomorphic cells with deep eosinophilic cytoplasm and tadpole- or ribbon-shaped tumor cells) with use of immunocytochemistry in embryonal RMS helps in ruling out other small round-cell malignancies [4] like neuroblastoma, thus expediting the preoperative diagnosis, treatment and hence, clinical outcome of the patient.

CONCLUSIONS

Though described rarely, the specific cytomorphology with use of ancillary techniques like immuncytochemistry can aid a pathologist in arriving at a diagnosis of embryonal RMS with unusual presentation; henceforth improving patient's clinical course.

REFERENCES

1. Crozier E, Rihani J, Koral K, Cope-Yokoyama S, Rakheja D, Ulualp SO. Embryonal rhabdomyosarcoma of the auricle in a child. Pediatrics International. 2012 Dec;54(6):945-7.
2. Kline RM, Oseas RS, Jolley SG, Reyna TM, Erling MA, Sandberg AA, Meloni AM. Leptomeningeal metastasis from a paraspinal rhabdomyosarcoma with a der (13) t (1; 13)(q23; q32) in a 14-month-old boy. Cancer genetics and cytogenetics. 1997 Oct 15;98(2):97-101.
3 Fountas KN, Donner RS, Nikolakakos LG, Feltes CH, Karampelas I, Robinson JS. Adult paravertebral pleomorphic rhabdomyosarcoma infiltrating diffusely the whole spinal axis: Case report. Journal of Neurosurgery: Spine. 2005 Mar 1;2(3):344-8.
4. AKSU Ö. Cytologic diagnosis and subtyping of rhabdomyosarcoma. Cytopathology. 1998 Dec;9(6):389-97.