

Melanotic Neuroectodermal Tumor of Infancy

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Melanotic neuroectodermal tumor of infancy (MNETI) is also known as pigmented neuroectodermal tumor of infancy, melanotic prognoma, retinal anlage tumor, pigmented epulis of infancy and congenital melanocarcinoma. It is a rare neoplasm, occurring primarily in maxilla and mandible of infants. Till 1990 about 200 cases had been recorded in world literature(1,2). We report a case with this entity.

Case Report

A two and a half month old male infant presented with gradually increasing swelling in the upper jaw for one month. The swelling involved the alveolus of the upper left incisor region and measured 1.5x1.5 cm. It was firm in consistency and extended into the hard palate. The overlying mucous membrane was uninvolved. Systemic examination revealed no other significant abnormality. X-Rays of the skull (PA and lateral views) showed a lytic lesion in the hard palate. Urinary level of vanillyl mandelic acid (VMA) was elevated.

Fine needle aspiration cytology of the lesion was done with a 10 ml disposable sy-

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ringe and 22 gauge needle. Slides were prepared and stained with Giemsa, Hematbx-ylin-Eosin and Papanicolou stain. The smears were moderately cellular comprising of loose clusters of round to oval cells with indistinct cytoplasmic outline (*Fig. 1*). These cells showed mild anisonucleosis with finely dispersed chromatin. Only a few cells showed a prominent nucleolus. A diagnosis of small round cell tumor was suggested and a biopsy advised.

A wedge biopsy was performed. On gross examination the specimen comprised of multiple light brown to dark brown, soft to firm, irregular bits, together measuring 1x1x0.2 cm. Microscopically the sections comprised several bits of gingiva and a fragment of unencapsulated tumor tissue. The tumor tissue composed of irregular alveolar spaces lined by larger cuboidal cells with moderate amount of cytoplasm and well defined margins, some of which contained brownish pigment. The pigment was confirmed to be melanin by fontana stain. Their nuclei were round to oval with finely dispersed chromatin and inconspicuous nucleoli. In addition, small round cells, with scanty cytoplasm and darkly staining nucleus, were present within the spaces (*Fig. 2*) or seen as isolated nests within a fibrous tissue. Isolated clusters of the larger cells were also present. There was no evidence of atypical mitosis or necrosis in the biopsy. A diagnosis of melanotic neuroectodermal tumor of infancy was made. The mass was later excised and histologically confirmed as a melanotic neuroectodermal tumor of infancy, involving the cancellous bone. Immunohistochemical stains for S-100 protein was consistently positive in the larger cells and focally positive in the smaller cells.

Discussion

Krompecher first described the tumor

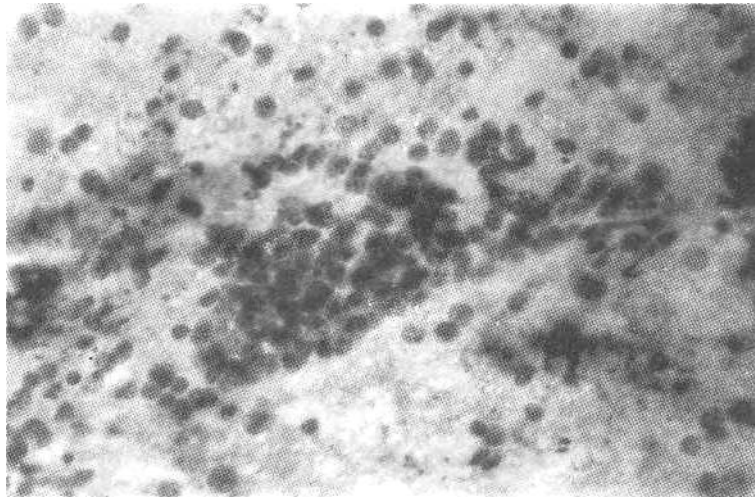


Fig. 1. FNA smear showing moderately cellular aspirate containing loose clusters of cells with round to oval nuclei and evenly dispersed nuclear chromatin (Giemsa x 200)

as 'congenital melanocarcinoma' in 1918. Since then it has been known by a variety of names. Borello and Gorlin suggested the term 'Melanotic Neuroectodermal Tumor of Infancy' which has now been universally accepted(2). It frequently involves the maxilla of infants less than one year of age with a moderate predominance in males(3). Occasional reports in adults have been widely believed to be misdiagnoses(3). Extramaxillary locations reported include the mandible, skull, long bones, epididymis, mediastinum, soft tissues of extremities and cheek and even brain(4).

MNETI was previously thought to be of odontogenic origin but immunohistochemical and ultrastructural studies, occasional demonstration of neuronal differentiation and vanillylmandelic acid production have confirmed the neural nature of this neoplasm[^]). Increased preoperative serum levels of noradrenaline, adrenaline, vanillylmandelic acid and neuron specific enolase which returned to normal following surgery and chemotherapy(5) have been reported. The variable expression of

immunohistochemical markers in different studies suggest that MNETI is a primitive neuroectodermal tumor with polyphenotypic expression of neural and epithelial markers, melanin production, occasional rhabdomyoblastic(6), glial(6), ganglionic(7) and osseous(8) differentiation and no photoreceptor differentiation[^]). It probably represents a dysembryogenetic neoplasm that recapitulates the retina at 5 weeks of gestation(6). Cultured cells derived from MNETI ultrastructurally revealed long dendritic process and evidence of melanin production. The cytoplasm contained numerous melanosomes in various stages of development, vesiculated rough endoplasmic reticulum, microfilaments and uncoated as well as coated vesicles. The membrane specializations include caveoli, coated pits, gap junctions, microfilaments, desmosome-like structures and lamellipodia(9).

The behavior of this tumor is generally benign but some cases with aggressive local behavior and rapid growth have been documented(10). MNETI is known to re-

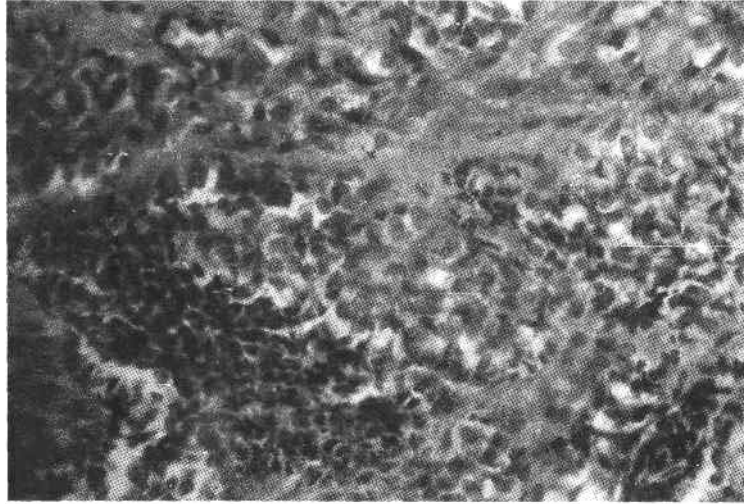


Fig. 2. Microsection showing bimodal population of cells arranged in alveolar pattern and intra-cellular pigment in larger cells (H&E $\times 200$).

cur, the reported rate being 10-15%, and multicentric lesions may be responsible for this. Few cases have also resulted in distant metastasis(11). Recurrences cannot be predicted even by flow cytometric studies(12). However, some authors(13) suggested that presence of necrosis and numerous mitosis in the neuroblastic component indicated the aggressiveness of the tumor, necessitating a post-operative chemotherapy. Rapidly growing lesions may clinically be mistaken for malignancy despite benign histologic appearance. Hence its awareness is desirable both by the surgeon and pathologists.

Since the patient did not return after surgical excision hence the actual biological behavior of the tumor could not be assessed. Although the prognosis of benign MNETI is excellent after complete surgical excision, long term follow up is always mandatory as the course of the disease cannot be predicted by morphological findings(14).

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