# NEUROCUTANEOUS MELANOSIS

*B. Mallika[1], V. Kalyan Chakravarthy[2], D. Ranga Rao[3]*

*[1]Assistant Professor, Department of Pathology, Dr. PSIMS & RF, Chinna Avutapalli, Andhra Pradesh, India.*
*[2]Professor, Department of Pathology, Dr. PSIMS & RF, Chinna Avutapalli, Andhra Pradesh, India.*
*[3]Professor and HOD, Department of Pathology, Dr. PSIMS & RF, Chinna Avutapalli, Andhra Pradesh, India.*

**HOW TO CITE THIS ARTICLE:** Mallika B, Chakravarthy VK, Rao DR. Neurocutaneous melanosis. J. Evolution Med. Dent. Sci. 2019;8(10):749-750, DOI: 10.14260/jemds/2019/164

## PRESENTATION OF CASE

A 17 year old boy was admitted at our hospital with a 10 day history of diplopia, giddiness and headache. He also had dry cough, abdominal discomfort and projectile vomiting since 5 days. He was born with multiple pigmented lesions ranging from 2 to 8cm in size on his extremities, back and scalp; a few being confluent hairy nevi. His psychomotor development was normal except for stammer since birth. No significant family history was elicited on the interview. A biopsy of the lesion on the back was done 2yrs earlier showed a benign junctional nevus. Neurological examination revealed sixth nerve palsy and a positive Romberg's sign.

Unenhanced MRI showed, extraventricular communicating hydrocephalus; hypoplasia of inferior cerebellar vermis, dilatation of fourth ventricle with enlarged posterior fossa, multiple cysts in the posterior fossa indicating a Dandy-Walker variant.

A V-P shunt was done to relieve the hydrocephalus. CSF cytology and biochemistry were unremarkable. An excision biopsy of the hairy melanocytic nevus on the right lower back was done; the diagnosis proved to be a melanocytic junctional nevus. A burr hole exploration of posterior fossa was performed. A large dark brown black coloured cyst measuring 7x5x4 cm was seen showing clear demarcation with no obvious infiltration into the adjacent brain cortex and causing distortion of cerebellar hemispheres and vermis. It was excised and sent for HPE. Macroscopically a membranous dark brown cyst wall measuring 7x4cm was seen. The tissue was routinely processed in formalin. Sections studied showed a cellular tumour arranged in sheets and in small nests with no infiltration. The tumour cells were round to oval with scant cytoplasm, indistinct cell borders, and large nucleus with prominent nucleolus in majority of them. Also seen were intracytoplasmic brownish black pigment in some of the tumour cells. The pigment was confirmed to be melanin by melanin bleach, Fontana Mason stain and HMB 45 immunostain. There was no necrosis or increased mitosis. The overlying arachnoid tissue also showed heavy pigmentation. A combination of histopathological, clinical and radiological findings was consistent with the definite diagnosis of NCM with DW Variant. Patient is doing well since 2 years.

*'Financial or Other Competing Interest': None.*
*Submission 04-01-2019, Peer Review 22-02-2019,*
*Acceptance 28-02-2019, Published 11-03-2019.*
*Corresponding Author:*
*Dr. B. Mallika,*
*Dr. PSIMS & RF,*
*Chinnaoutapalli, Gannavaram,*
*Andhra Pradesh,*
*India.*
*E-mail: kalyancv74@yahoo.com*
*DOI: 10.14260/jemds/2019/164*

## CLINICAL DIAGNOSIS

Melanocytoma

## DIFFERENTIAL DIAGNOSIS

- Melanoma
- Melanocytoma

## DISCUSSION/ PATHOLOGY & MANAGEMENT

Neurocutaneous melanosis (NCM) is a rare congenital nonfamilial nonheritable neurocutaneous syndrome with equal gender preponderance. It is characterised by large (>20cm) or multiple pigmented nevi along with benign and/or malignant, melanocytic tumours of leptomeninges. Around 120 cases of NCM have been reported in literature till date. 8-10 % of those were associated with Dandy-Walker malformation (DCM) indicating a common origin of these developmental anomalies. Majority of the above cases reported are in the paediatric age group & were proved to be rapidly fatal by the age of 4yrs. We here report the clinical, radiological and histopathological findings of a rare case of NCM associated with DWM in a 17 year old adolescent male.

Neurocutaneous syndromes or phakomatoses are congenital abnormalities, involving the skin and CNS. NCM is an unusual and less acknowledged member of this group and has been classified as a neuroectodermal dysplasia.[1,2,3,4] NCM typically occurs in whites and with equal frequencies in both sexes[5]. Malignant transformation is seen in about 40–60% of cases and the patient is lost due to CNS complications [2]. In addition, the rate of development of cutaneous malignancy is 2% to 13% when a giant hairy nevus is present[6]. Kadonaga and Frieden in 1992 introduced the current criteria and defined NCM as a large nevus (>20 cm in adults and 9 cm on the head or 6 cm on the body in infants) or multiple nevi (≥3 lesions) without the evidence of cutaneous melanoma, except in cases where meningeal lesions are histologically benign or that of primary meningeal melanoma except in cases where the cutaneous lesion are benign.[7]

According to above criteria, our case was compatible with diagnosis Of NCM (multiple nevi, no evidence of cutaneous melanoma or meningeal melanoma).

The precise pathogenesis of NCM remains incompletely understood, but it is thought to be related to a congenital dysmorphogenesis of neural crest–derived pluripotent precursor cells that normally migrate from the neuroectoderm to the meninges and skin. Such leptomeningeal abnormalities might affect the proper development of the fourth ventricle and the cerebellum, resulting in an increased association of DWM with NCM.[8] Of the approximately 115 cases of NCM reported, in at least 15 cases, there was an association with DWM. The association of Dandy-Walker malformation with DWM seems to have an extremely poor prognosis. In all reported cases, the patients showed rapid neurological deterioration and death by four

years of age. The presence of these two abnormalities represents a phenotypic marker for more profound melanotic infiltration of the leptomeninges, which increases the risk of malignant transformation.

NCM has been divided into asymptomatic and symptomatic (or manifest) forms, according to clinical manifestations. While symptomatic cases are known to have a poor prognosis, the outcome of asymptomatic cases whose NCM is discovered by screening is more difficult to predict. Symptomatic NCM is manifest during the first year of life in 50% of cases and less frequently during the second or third decades.[9] Patients with NCM may have focal or generalized neurological deficits. After the first neurological abnormalities are apparent,

more than half of the patients die within three years, mostly due to increased intracranial pressure[2, 9]. In a series of 71 cases, 5 mortality occurred in 55 patients (77%), with a median survival time of 6.5 months after symptom onset and a median age at death of 4.5 years.[8]

The macroscopic histological features of NCM have been described as thickening of the leptomeninges by infiltrative tumour cells with predilection for the basal surface of the brain as well as the rostral portion of the brain stem. Lesions over the convexity, although infrequent, can associate with invasion of the brain parenchyma.

The classic microscopic appearance is invasion of the Virchow-Robin spaces, with three types of lesions: (1) S-type or spindle patterns with interlaced bundles of cells, (2) R type or mosaic pattern with polyhedral cells with large cytoplasm and clear nucleus, and (3) W-type with numerous cells presenting vesicular nuclei and scant cytoplasm. To increase the specificity of the histological diagnosis, tissue samples should be studied with conventional light microscopy, electron microscopy, and immunohistochemical staining for S-100 and HMB-45[2]. Immunoreactivity for vimentin, S-100 protein, and HMB-45 is regularly present, melanocytomas – in contradistinction to meningiomas – being EMA negative.[7] Tumour cells may also label for MART-1 (melan-A/A103), tyrosinase, and microphthalmia transcription factor.[7]

Evidence of melanocytic activity is determined by the presence of melanocytes in a CSF sample or in a leptomeningeal biopsy. Histological features of malignancy are:

Mitotic activity, annulate lamellae, invasion of the basal lamina of blood vessels at the Virchow-Robin space, and necrosis.[2] Virtually amelanotic examples may be encountered but are exceptional.

Ultrastructural studies will confirm the presence of mature melanosomes and may show basement membrane material (Also demonstrable in type IV collagen immunopreparations) to incompletely invest some cellular processes or to surround groups of neoplastic melanocytes.

Dandy-Walker consists of a spectrum of midline anomalies of the hindbrain. The main features of Dandy-Walker malformation are cystic enlargement of the fourth ventricle, cerebellar dysgenesis, and an enlarged posterior fossa resulting from mal development of the rostral embryonic roof of the rhombencephalon, with or without hydrocephalus.[10]

**FINAL DIAGNOSIS**

Neurocutaneous Melanosis and Melanocytoma Associated with Dandy-Walker Malformation.

**REFERENCES**

[1] Berker M, Oruckaptan HH, Oge HK, et al. Neurocutaneous melanosis associated with Dandy-Walker malformation. Case report and review of the literature. Pediatr Neurosurg 2000;33(5):270-3.

[2] Caceres A, Trejos H. Neurocutaneous melanosis with associated Dandy-Walker complex. Childs Nerv Syst 2006;22(1):67-72.

[3] Humes RA, Roskamp J, Eisenbrey AB. Melanosis and hydrocephalus. Report of four cases. J Neurosurg 1984;61(2):365-8.

[4] Reyes-Mugica M, Chou P, Byrd S, et al. Nevomelanocytic proliferations in the central nervous system of children. Cancer 1993;72(7):2277-85.

[5] Araújo C, Resende C, Pardal F, et al. Giant congenital melanocytic nevi and neurocutaneous melanosis. Article ID 545603, Case Reports in Medicine 2015;2015: p. 5.

[6] Leaney BJ, Rowe PW, Klug GL. Neurocutaneous melanosis with hydrocephalus and syringomyelia. Case report. J Neurosurg 1985;62(1):148-52.

[7] Kadonaga JN, Frieden IJ. Neurocutaneous melanosis: definition and review of the literature. J Am Acad Dermatol 1991;24(5 Pt 1):747-55.

[8] Walbert T, Sloan AE, Cohen ML, et al. Symptomatic neurocutaneous melanosis and Dandy-Walker malformation in an adult. Journal of Clinical Oncology 2009;27(17):2886-7.

[9] Kalayci M, Cagavi F, Bayar U, et al. Neurocutaneous melanosis with Dandy-Walker malformation. Acta Neurochir (Wien) 2006;148(10):1103-6.

[10] Cho IY, Hwang SK, Kim SH. Dandy-Walker malformation associated with neurocutaneous melanosis. J Korean Neurosurg Soc 2011;50(5):475-7.