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Case Report

Lhermitte – Duclos Disease in a Young Adult: Rare Entity

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ABSTRACT

Lhermitte - Duclos disease also called dysplastic gangliocytoma of cerebellum is an extremely rare cerebellar lesion which share features of both malformation and neoplasm. The usual presentation is of raised intracranial pressure along with cerebellar signs. We report a case of 23 year male who presented with headache & diplopia. MRI was suggestive of the diagnosis. Subtotal excision of the mass along with shunt drainage was performed. Post operative course was uneventful. Histopathological features confirmed the diagnosis.

Keywords : **Lhermitte Duclos Disease, Case Report, India**

Introduction

Dysplastic gangliocytoma of cerebellum is a benign cerebellar mass composed of dysplastic ganglion cells. Uncertainty exists regarding labeling this lesion as neoplastic or hemartomatous (1). The incidence is about 5 per million per year. The disease is unique in neuropathology because of substantial metamorphosis of the cerebellar structure with sparing of its general configuration (2). We report a rare case of Lhermitte - Duclos disease (LDD) of a young male who presented with signs & symptoms of raised intracranial tension. In this report we would like to emphasize clinical presentation, radiological findings (MRI) and histomorphological features of this rare entity.

Case report

A 23 year young male came with complains of

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intermittent occipital headache and double vision of two month duration. There was no associated history of vomiting and seizures.

Neurological examination revealed an unsteady tandem gait, with tendency to fall on left. His finger- nose -finger test was impaired. Fundoscopy showed bilateral papilloedema. MRI scan revealed a 4×3×3 cms, non- enhancing, ill defined, heterogenous area of altered singnal intensity in the right cerebellar hemisphere. The cerebellar folia were prominent and thickened. It showed typical alternate hyperintense and iso-intense bands on T 2W1 image (Fig. 1).

Patient underwent suboccipital craniotomy with subtotal excision of mass along with right sided shunt. We received, multiple bits of soft, thickened cerebellar tissue aggregating about 4cc. Histology revealed enlarged, thickened cerebellar folia with well maintained architecture (Fig. 2). The inner layer which normally shows granule neurons is replaced by intermediate to large size neurons resembling ganglion cells (Fig. 3).

The ganglion cells showed central to eccentric, round nuclei with finely granular chromatin and nucleoli in some (Fig. 3 inset). At places, nucleomegaly and binucleation was seen. The molecular layer showed thickened and elongated axonal bundles which were highlighted in Belchouski stain (Fig. 4).

In Kruver Barrera stain for myelin, these axonal fibres appear myelinated (Fig. 5). The axonal bundles in deeper part of themolecular layer were perpendicular while in superficial part were parallel to the pail surface.

Immunohistochemistry for synaptophysin exhibited classical surface perikaryal, coarse, granular positivity along the pre-synaptic vesicles in ganglion cells (Fig. 6).

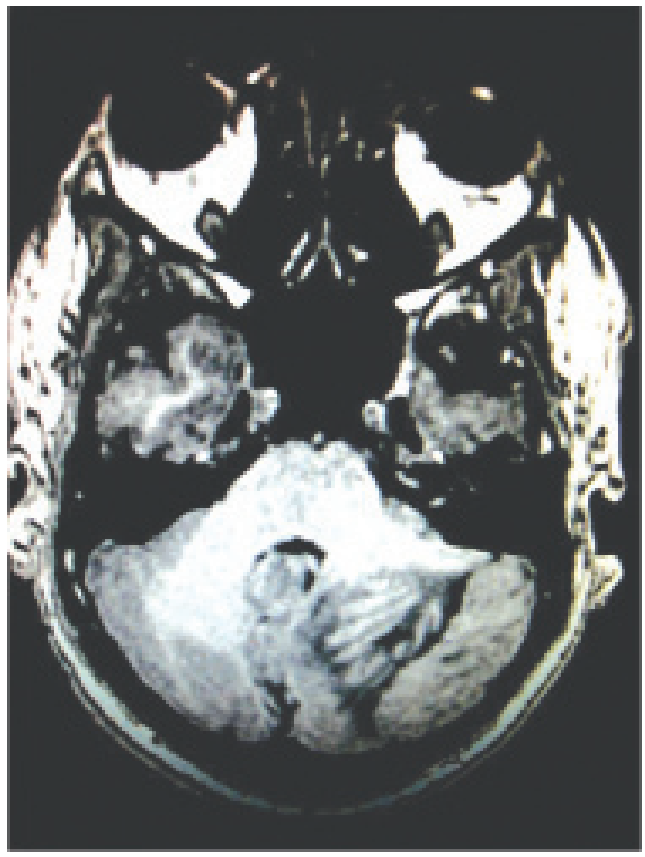

Fig.1- Non- enhancing, illdefined, heterogenous area of altered signal intensity in the right cerebellar hemisphere, giving a tiger stripped effect on T2W1 image.

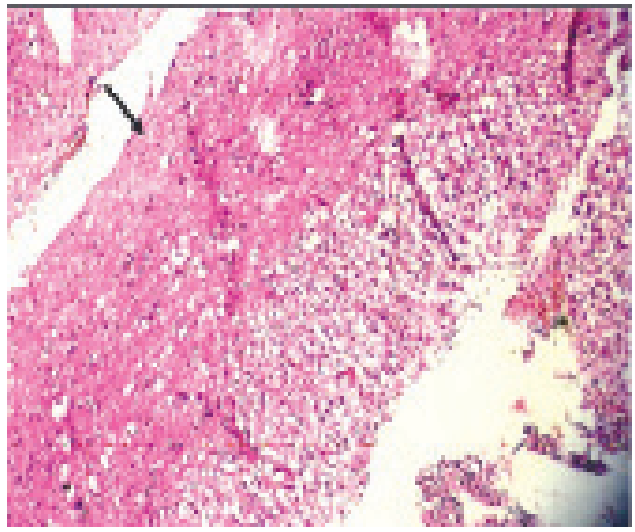

Fig. 2- Enlarged, thickened cerebellar folia with well maintained architecture (H&E stain ×100)

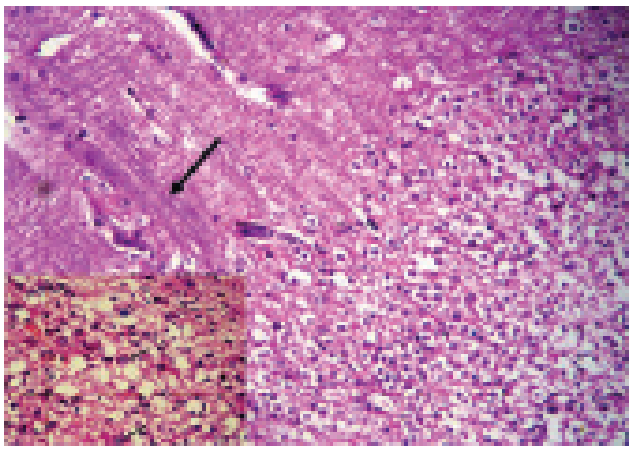

Fig. 3- The inner granular layer is replaced by intermediate to large size neurons resembling ganglion cells. Arrow showing parallel axonal bundles in outer molecular layer. (H&E stain, ×200). b (inset): Ganglion cells with eccentric nuclei & prominent nucleoli (H&E ×400)

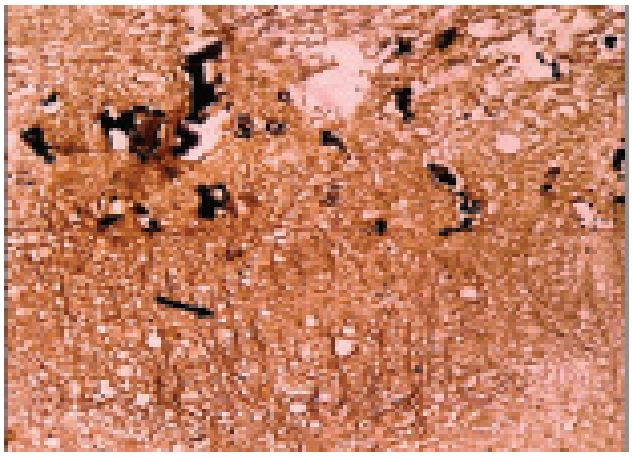

Fig. 4- The molecular layer showing thickened & elongated axonal bundles. (Brown color in Belchouski stain for axonal fibres, ×200)

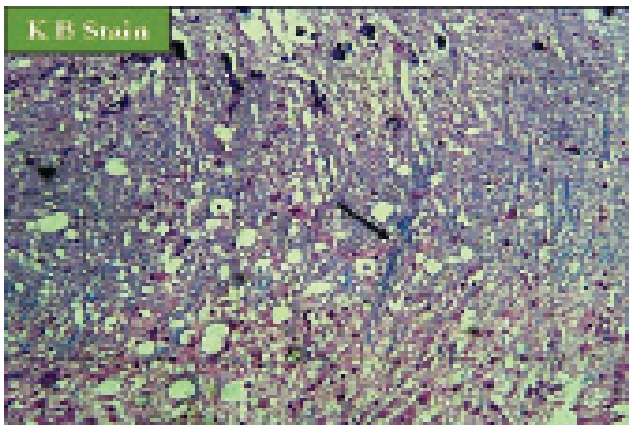

Fig. 5- The molecular layer showing thickened myelinated axonal bundles (Blue Colored myelinated fibres in Kruver Barrera Stain for myelin, ×200)

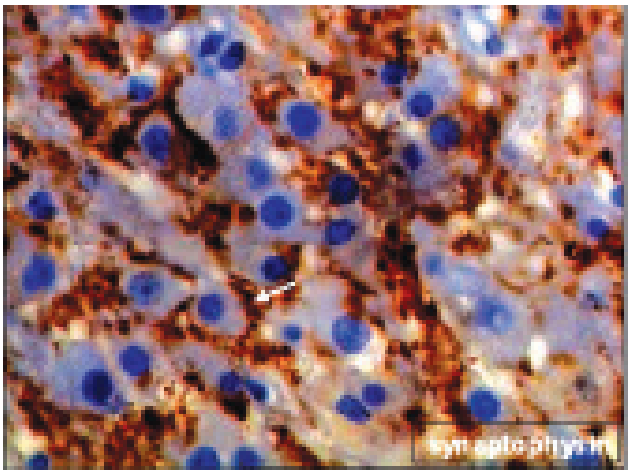

Fig. 6- Classical surface perikaryal, coarse granular positivity along the pre- synaptic vesicles in ganglion cells. (IHC for Synaptophysin, ×400)

Discussion

In 1920, Lhermitte and Duclos described this unusual abnormality of cerebellum characterized by enlarged cerebellar folia which contained circumscribed region of abnormal ganglion cells (2). Although this disorder is now classified as a dysplastic gangliocytoma, plethora of names such as benign hypertrophy of cerebellum, purkinjinoma, hemartoma of cerebellum, diffuse ganglioneuroma of cerebellar cortex, Lhermitts - duclos disease (LDD) reflects difficulty in pathogenetic classification (1,3).

It still remains unclear whether LDD is hemartomatous or neoplastic. If neoplastic, it corresponds histologically to WHO grade I. Malformative histopathological features, absent proliferative activity and absence of progression favour hemartomatous origin. However recurrence in occasional cases & development in adult patients with previous normal MRI support a neoplastic category (1, 4). Cerebellar granule neuron is the cell of origin. Combination of its aberrant migration & hypertrophy is responsible for its development (1).

The association of dysplastic gangliocytoma with Cowdens disease is recently been recognized. Cowdens syndrome is an autosomal domi-

nant disease characterized by multiple hemartomas & high risk of visceral malignancies such as breast, non- medullary thyroid & endometrial carcinoma. It is caused due to germline mutation in PTEN (Phosphatase Ten sin homologue on chromosome TEN) gene (1,4) .

Clinically patient of LDD may be asymptomatic or present with signs of raised intracranial tension. MRI is the modality of choice which reveals a non- enhancing cerebellar mass with a typical striated or tiger stripped folial pattern due to alternate hyper intense & iso intense bands on T2W images (1, 5-7). Grossly the lesion appears poorly circumscribed mass showing thickened, enlarged, firm gyri in contrast to the adjacent normal appearing folia. On histology the enlarged folia show two layer patterns, the inner granular layer is replaced by large neurons resembling ganglion cells. The outer molecular layer shows thickened and myelinated axonal bundles. They are very well brought out in Belchousky stain and appear brown in color. Myelination of these axonal fibres is better appreciated in Kruver Barrera Stain for myelin which stains them in blue color. This change is described as inside-out of the cerebellum. The purkinje cell layer is absent. Similar histomorphological features are well explained by Govindan *et al*. in their recent article. The molecular layer may also show microcystic change & calcific blood vessels. Immunohistochemically ganglion cells show coarse granular positivity for myelin (3-5,8-10).

The differential which needs consideration is conventional ganglion cell tumor, gangliocytoma & ganglioglioma. Telltale radiological features along with geographic confinement of ganglion cells to internal granular layer favor the diagnosis of LDD.

While in conventional gangliocytoma & ganglioglioma, irregular distribution of variable sized neurons of ganglion cell type are seen against a background of delicate fibrillary matrix. In case of ganglioglioma, glial component is typically astrocytic and GFAP positive (11). In a fragmented biopsy when architecture is not very clear, the radiological features will help in clinching the correct diagnosis (4). Decompression of ventricular system is the immediate goal of therapy in virtually all cases. A ventricular shunt is placed initially followed by tumor resection.

Total resection may not be possible in all cases due to absence of a cleavage plane between lesion & surrounding normal brain parenchyma. It may be the cause for recurrence noted in some cases (5, 6, 8).

To conclude Dysplastic gangliocytoma of cerebellum is of benign behavior with a rare incidence. The disease should be confronted in a young adult with clinical signs of progressive mass effect in the posterior fossa. The histopathological features in itself are diagnostic however if substantiated by radiology whenever required can clinch the diagnosis in most of the cases. Its recognition is of particular importance due to co existence with Cowdens syndrome and should prompt thorough clinical examination in view of increased risk of visceral malignancy.

Acknowledgement

The authors declare that there is no conflict of interest.

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