

**A CASE OF HYDROCEPHALUS AND DANDY-WALKER SYNDROME IN A CALF**

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**Abstract**

One month old mix breed calf was taken to our clinic with a complaint of incoordination and inability of standing without help. There was no inbreeding in the farm and other calves from the same animals of the calf showed no abnormalities. In clinical examination the calf was not able to stand, sucking reflex, pupillary light reflexes and menace response was suspected. There was no deformation of cranium and any parts of body of the calf. Complete blood count was normal. MRI examination showed that posterior horns of lateral ventricles and fourth ventricle were dilated. Severe internal hydrocephalus and aplasia of the cerebellum was present. These findings are similar with the Dandy-Walker syndrome of human medicine. It was operated and shunt was placed to the level of foramen magnum. After one month, calf was able to stand in sternal position but could not stand without help. In MRI examination there was no change of ventricles and amount of cerebrospinal liquid. This is the first Dandy-Walker syndrome case which was diagnosed with MRI and followed up in calves.

***Key Words:** Hydrocephalus, Dandy-Walker Syndrome, Calf.*

In 1914 Dandy and Blackfan described a congenital malformation of the central nervous system comprising dilation of the fourth ventricle, hypoplasia of the cerebellar vermis, and hydrocephalus. Forty years later Benda termed the lesion “Dandy–Walker malformation” to acknowledge contributions made by Taggart and Walker in 1942 (2,10). Dandy-Walker malformation (DWM) is the most common human cerebellar malformation, characterized by partial or complete agenesis of the cerebellar vermis, cystic dilation of the fourth ventricle, and an enlarged posterior fossa with upward displacement of the lateral sinuses, tentorium, and torcular (5,11).

Dandy Walker malformation is associated with other central nervous system abnormalities including dysgenesis of corpus callosum, ectopia brain tissue, occipital meningocele, neural tube defects, visual deficits and epilepsy (5). Although its pathogenesis is not completely understood, there are several genetic loci related to DWM as well as syndromic malformations and congenital infections (1).

Hydrocephalus may cause increased intracranial cerebral pressure, progressive

enlargement of the head, convulsions, mental disability, and even death. Although hydrocephalus is not an absolute criterion for the diagnosis of DWS, complications from it are common, and 5-10% of congenital hydrocephalus cases are found in DWS in human medicine (6,10).

Several options have been proposed, but contemporary management still remains controversial in human medicine. The aim of surgical treatment is usually the control of hydrocephalus and the cyst cavities. (12). Ventriculoperitoneal (VPS) and lumbar-peritoneal shunts (LPS) are the two most common routes to control of both ventricle and cyst size (3,10). Also endoscopic procedures may be considered like endoscopic third ventriculostomy for the placement of these shunts to reduce shunt related problems (8,12). In significant hydrocephalus cases, ventriculoperitoneal shunts can be used because of easier to place and have a relatively low incidence of malposition or migration (10).

In animals, the absence of the cerebellar vermis and cystic dilatation of the fourth ventricle were comparable to the changes seen in humans with Dandy-Walker syndrome. Congenital cerebellar abnormalities similar to those seen in humans with this syndrome, have been reported in cows, horses, sheep, dog and a cat. In these cases, the degree of cerebellar vermish malformation varied from hypoplasia to complete agenesis (4,7,9,13).

A one month years old, male, mix breed, calf was brought to Ankara University, Faculty of Veterinary Medicine, Surgery Clinic due to a history of progressive ataxia. In a physical examination, sucking reflex and body condition score is normal. It could not coordinate its movements to stand or walk. could not stand without help, fell towards both sides, In a neurological examination, the calf was alert and responsive, pupillary light reflexes and menace response was suspected. With help, it was standing and during voluntary movements severe ataxia was seen. Complete blood count was normal. For further diagnostic evaluation CT and MRI was taken under general anesthesia.

MRI examination showed that posterior horns of lateral ventricles and fourth ventricle were dilated. Severe internal hydrocephalus and aplasia of the cerebellum was present (Fig 3,4) These findings are similar with the Dandy-Walker syndrome of human medicine. It was taken under general anesthesia with diazepam and ketamine HCl and intubated. Sefazoline sodium (20 mg/kg, iv) administered before surgery. Level of the foramen magnum prepared for the surgery and a sclap incision was done. The placement of a shunt performed through a

burr hole drilled into the suboccipital area just lateral to the midline and tip of the catheter placed in cyst. Catheter placed under the skin and other tip of the catheter placed in the thorax for CSF flow to the trohax. X rays taken to confirm shunt placemnet position (Fig 2). Postoperativly meloxicam used for analgesia and topical wound management was done daily.

After one month of the operation, calf was able to stand in sternal position but could not walk without help. (Fig 1). Control MRI was taken after one month and seen there was no change of ventricles and amount of cerebrospinal liquid. (Fig 5,6). Because of the neurological improvement was not favorable euthanasia was decided and performed. The etiology of the patient's cerebellar malformations was not determined. This is the first Dandy-Walker syndrome case which was diagnosed with MRI and followed up in calves.

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Fig.1 Post operative 4 th week.



Fig. 2 X Ray of region after shunt placed.

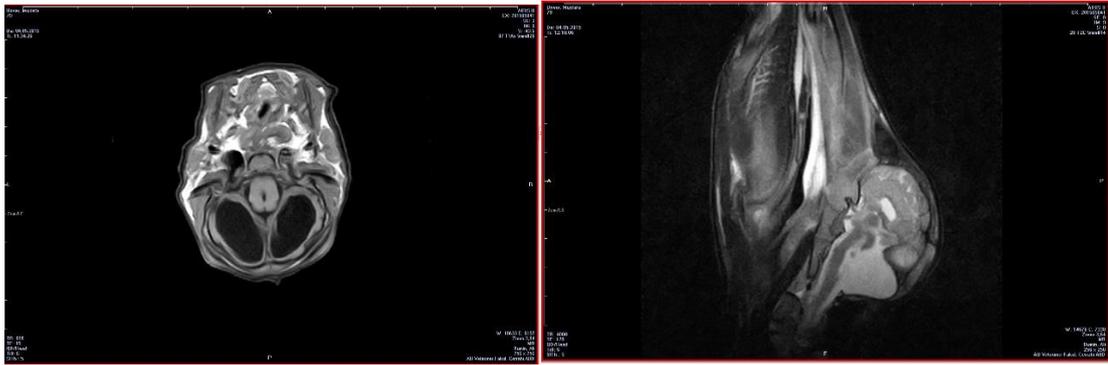


Fig.3,4 Preoperative T1W transverse and T2W sagittal images of cystic cavity

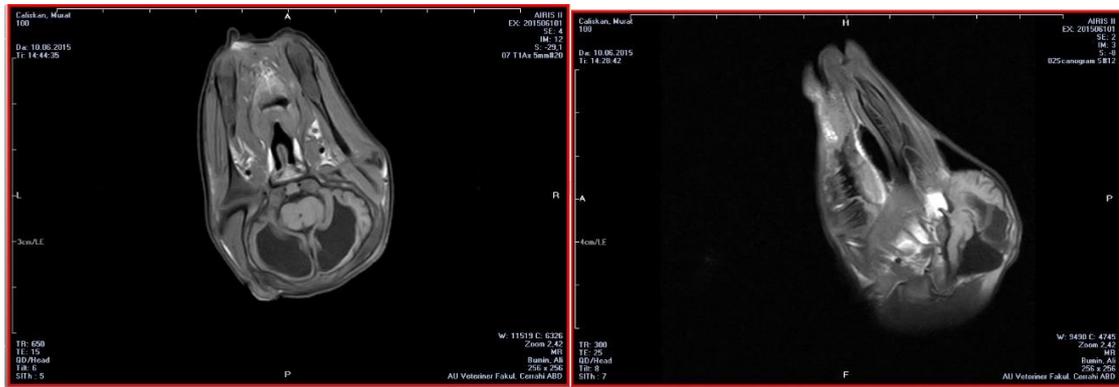


Fig. 5, 6 Postoperative T1W transverse and sagittal images of cystic cavity