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Case report

The patient with mild diencephalic–mesencephalic junction dysplasia – Case report and review of literature

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ABSTRACT

Diencephalic–mesencephalic junction dysplasia (DMJD) is very rare congenital brain malformation. We present a 66-years-old man with mild cognitive impairment, dysarthria, deafness, gait abnormality, and involuntary movements of the trunk. The first symptoms, psychomotor excitation and anxiety begun when he was over thirty years old however the symptoms gradually intensified and slowly progressed. The magnetic resonance imaging scans showed partial DMJD. According to recent date it represented type-B of the malformation with relatively mild phenotype in relation to the previously described in literature type-A. To the best of our knowledge this is the first description of an adult patient diagnosed with DMJD anomaly.

1. Introduction

Midbrain–hindbrain malformations (MHMs) are a rare heterogeneous group of structural posterior fossa abnormalities. They can be caused either by embryogenic disruptions or genetic mutations. The structural heterogeneity appears on some classifications based on wide spectrum of clinical manifestations, morphological pathologies, embryological and genetic defects [1–3]. They include Joubert syndrome and related disorders [4,5], horizontal gaze palsy and progressive scoliosis [6], pontine tegmental cap dysplasia [7], pontocerebellar hypoplasia [8], rhombencephalosynapsis [9]. The radiologically described patterns of structural differences in different MHMs can be used in correlation with clinical symptoms to estimate the possible impact of morphological changes on a patients' prognosis and mortality.

Diencephalic–mesencephalic junction dysplasia (DMJD) is a very rare MHM caused by early anteroposterior patterning defect of neural tube. During embryogenesis, mesencephalon is one of three primary vesicles (along with prosencephalon and rhombencephalon) whereas diencephalon is the secondary vesicle formed from prosencephalon (along with telencephalon). The diencephalic–mesencephalic junction (DMJ) is one of two important signaling centers of encephalon embryonic development (along with mesencephalic–rombencephalic junction). DMJ defects can probably appear due to impaired secretion of fibroblast growth factor 8 (FGF8) as well as impaired regulation the anterior–posterior expression of the engrailed (En) and

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Paired box (Pax) transcription factors [10,11]. However nothing is known of the mechanisms of DMJ defects in humans.

For the time being there have been published only few cases of DMJD patients [1,2,12,13] describing the possible correlations between the exact radiological imaging and clinical manifestations of the disorder. In a majority of cases, the neurological and general symptoms were rapidly accumulating in the first months after birth, but at the same time there was also a group of patients described by Severino et al. [13] as type B DMJ pattern. The group was neurologically less impaired in comparison to patients classified as type A DMJ pattern (Fig. 1).

2. Case report

1wThe 66-years-old man was hospitalized in Department of Neurology 3 times between 2014 and 2016. At this time he was suffering from deep disorders of speech articulation, deafness, gait disorders and involuntary movements of trunk. It is possible that the patient presented some retardation of psychomotor growth in childhood, but his parents were not aware of it. During his adolescence gradual deafness started leading finally to a complete lack of hearing at the age of sixty. When the patient was in his fifties slight involuntary movements of trunk begun. Also mild cognitive impairment appeared at this time followed by minor right hemiparesis and gait disorder. The symptoms gradually progressed. The patient's family became aware of the illness when the patient was almost sixty years old. One year later, after death of his son, symptoms of psychomotor excitation and anxiety appeared and progressed over two years. The patient was usually uneasy, irritable, depressed and anxious. He had tendency to speak and walk very quickly and rapidly. The patient was not examined nor diagnosed until the age of 65. At this age all of the symptoms of the illness were advanced and affected the daily life. The family history was negative.

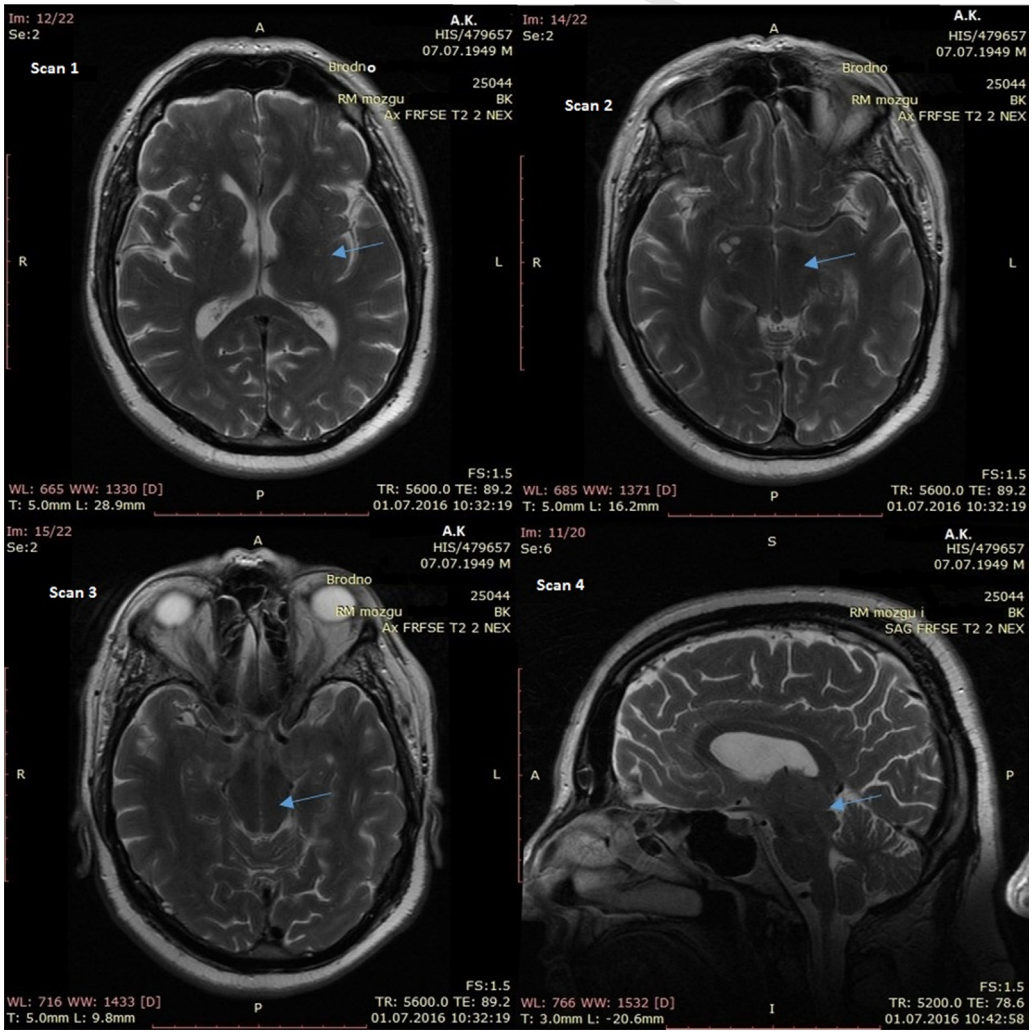

Fig. 1 – Structural brain images T_2-weighted MR images of the patient with *type B* DMJD. Scan 1: Abnormal contour of the thalamus and basal ganglia (arrow). Scan 2: Abnormal contour of the midbrain with fusion of the hypothalamus (arrow). Scan 3: Enlargement of the midbrain (arrow). Scan 4: Incomplete thalamic–mesencephalic cleavage sagittal plane with parenchymal bands connecting the interthalamic adhesion with the midbrain (arrow). These all scans show abnormal picture of the brain.

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