P-52

WDR45 Gene Mutation in Beta-propeller Protein-associated Neurodegeneration : A Case Report

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INTRODUCTION

Pathogenic mutation of the WDR45 gene causes Beta-propeller Protein-associated Neurodegeneration (BPAN), a rare X-linked dominant subtype of neurodegeneration with brain iron accumulation. BPAN is characterized by global developmental delay, seizures, movement disorders, and iron accumulation in the basal ganglia, with most cases occurring de novo.

Here we present a case of a female patient with a heterozygous WDR45 gene mutation (c.873C>G) who exhibited global developmental delay without other characteristic findings.

CASE REPORT

A 15-months-old girl was referred to for evaluation of global developmental delay.

Birth history

- Term (38weeks) – 3.64Kg – Cesarean section

Past history

At 13.5 months, presented with drowsy mental status and was hospitalized for 10 days.

- Diagnosed with respiratory syncytial virus infection.
- Brain MRI during hospitalization : multifocal FLAIR and T2 high signal intensities in the gray and white matter of both cerebral hemispheres.
  →Differential diagnoses included encephalitis or acute disseminated encephalomyelitis
- EEG : unremarkable.
- She was able to produce "mama" sounds while crying during hospitalization, but after discharge, she no longer made those sounds.

Developmental evaluation

Bayley-III Scales were administered at 15 and 19 months of age, and results are displayed in the table (Table 1).

Brain MRI

Follow-up brain MRI performed at the age of 16 months 20 days showed no definite structural abnormality (Figure 1).

Genetic evaluation

To investigate the underlying genetic cause, we performed chromosomal microarray and targeted next-generation sequencing (NGS). Additionally, we tested for Prader-Willi/Angelman syndrome and DMPK gene mutations.

- **NGS**
  Pathogenic WDR45 mutation(c.873C>G, heterozygous)

- Negative results
  -Chromosomal microarray
  -Prader-Willi/Angelman syndrome
  -DMPK gene mutations

Developmental evaluation (The Bayley III)	Patient (15months 19days of age)	
	DAE	Composite score
Cognitive	11 months	75
Receptive communication	16 months	74
Expressive communication	15 months	
Fine motor	18 months	73
Gross motor	18 months	
Social-emotional	-	90
Adaptive behavior	-	74

DAE; Developmental age equivalent

Table 1. Developmental evaluation of the patient using the Bayley III scales of Infant Development.

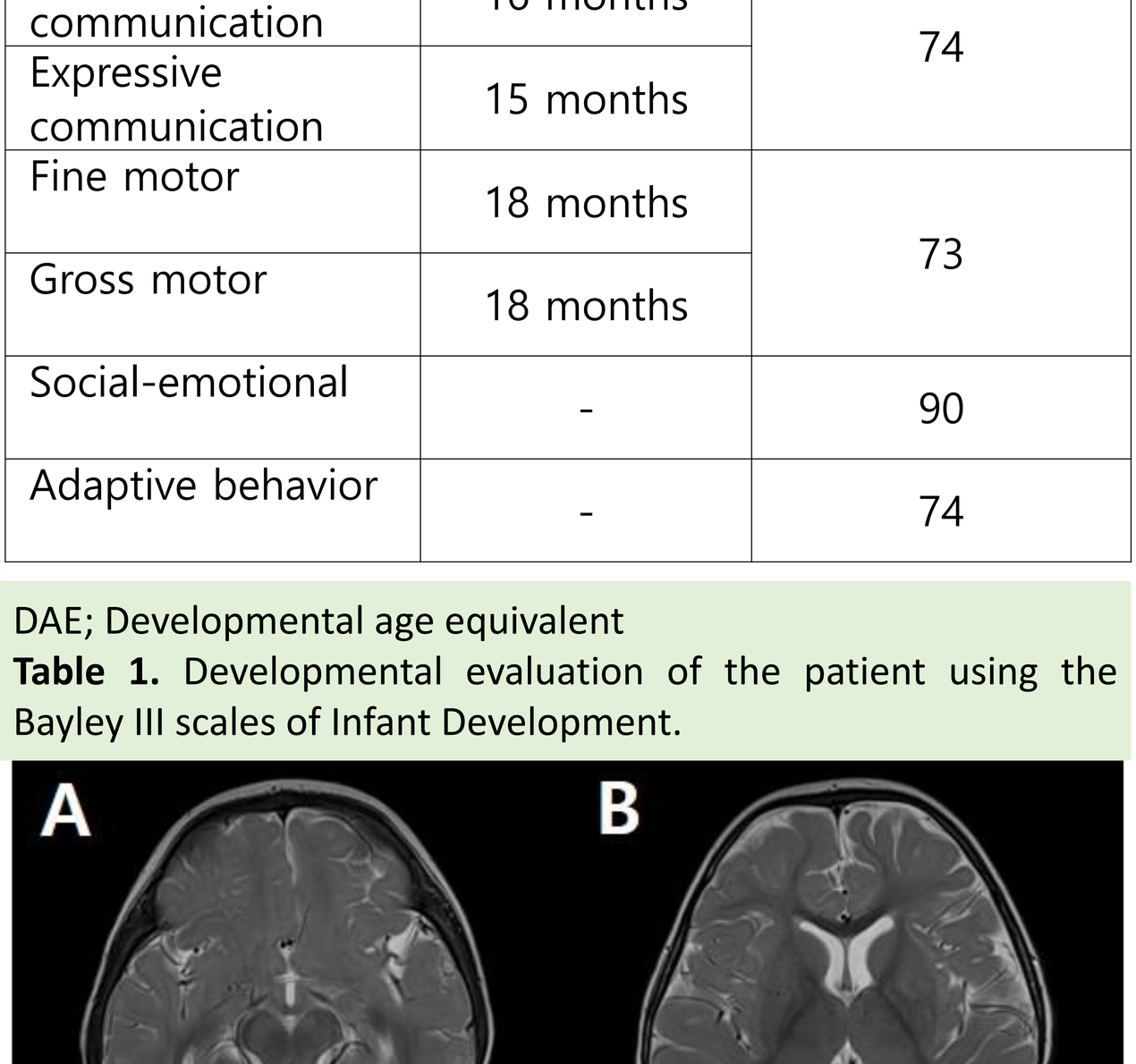

Figure 1. Brain MRI of a patient with BPAN at the age of 16 months 20 days shows no abnormality on T2-weighted (A, B) and susceptibility-weighted (C, D) images.

CONCLUSION

We report a case of a WDR45 gene mutation in a female patient presenting with global developmental delay. Since she is relatively young and has not yet reached the age when typical neurodegenerative symptoms appear, close monitoring and regular follow-up are essential to track potential disease progression and provide timely interventions.

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