Journal of MEDICINE–24
August 2026, Volume 3, Issue 2, pp. 11−16
DOI: https://doi.org/10.36719/3104-4700/5/11-16

Rett Syndrome: A Case Report

Maleyka Karimova[1*], Bahar Gadimaliyeva[2], Sevda Suzme[3]

Abstract. *Rett syndrome (RS) is a severe neurodevelopmental disorder leading to severe intellectual disability in females worldwide. The condition is caused by a random mutation in the MECP2 gene, which is located on the X chromosome. Because it occurs as a spontaneous genetic change, it is rarely inherited from the parents. RS is accompanied by a large number of stereotypical movements, which are often mistaken for seizures. A ten-year-old girl presented with classic features of RS, including developmental regression with dementia, loss of acquired speech and hand function, and stereotypic hand movements along. A molecular genetic study was carried out, using direct automatic sequencing of the MECP2 gene (NM_001110792.2), a search for the mutations was carried out, during which the c.982dup (p.Val328GlyfsTer15) mutation was discovered in the heterozygous state, a diagnosis of "Rett syndrome" was made. Since there is no specific treatment for it, the child is recommended symptomatic: with the use of drugs, improving cerebral circulation; rehabilitation: with courses of massage, physiotherapy, a developed complex of physical therapy, speech therapy treatment. An integral part of rehabilitation is the use of psychosocial, psychoeducational programs for the patient and all members of his family.*

Keywords: *Rett syndrome, MECP2, developmental regression, clinical variability, stereotypical movements*

Case Report

The 10-year-old girl is the 3rd child of the family. She was born naturally to a 28-year-old mother. At birth, the weight of the girl was 3500 g (50–75 p), her height was 46 cm (50–75 p). The girl's elder sister and brother are healthy. There were no problems during the prenatal and delivery periods. Its development is defined as normal in the first 3 months. His growth stopped due to vomiting that started from the 4th month, and his interest in the environment began to decrease. The patient repeatedly referred to a gastroenterologist due to vomiting. Language development has not progressed beyond making sounds in the form of mumbling. Sphincter control not developed. Standing at age five and started sorting. Loss of eye contact was observed at the age of 7 months, followed by a gradual change into an introvert. The patient had been previously examined by several doctors, and a diagnosis of autism had been made based on behavior. When a disorder was detected in the EEG taken when he was four and a half years old, valproate was started and EEG was taken later. Bilateral parietal and midline prominent epileptiform discharges were detected and drug treatment was switched to Lamotrigine.

[1]Azerbaijan Medical University, PhD in Medicine, Baku, Azerbaijan
[2]Turan Hospital, MD, Baku, Azerbaijan
[3]Binagadi Medical Center, MD, Baku, Azerbaijan
[*]Corresponding author. E-mail: dr.karimova@mail.ru
Received: 10 April 2026; Accepted: 17 July 2026; Published online: 15 August 2026

At the age of 6, the patient could stand with help. Hand limited skills, licking hands and winging flapping stereotypies, bending at the midline they had movements. His interest in the environment was quite limited. It wasn't conscious word usage, just making sounds like mumbling. It was stated that the girl, who was interested in rotating objects, really loved music. On the other hand, it was stated that the girl has been calmer lately. When he was 10 years old, he was 109 cm, weight 10.9 kg. From the patient's anamnesis, it can be seen that repeated vomiting was observed since 2–3 months of his life.

The patient also has strabismus and pes echinovalgus. It is known from the anamnesis that the child's mother and father are 1st degree relatives. The daughter of the parents' aunt has epileptic seizures and mental retardation. A genetic examination for Rett syndrome was suggested, suspecting the child's anamnesis and clinical symptoms. Genetic examination confirmed that the girl has RS. A molecular genetic study was carried out, using direct automatic sequencing of the MECP2 gene (NM_001110792.2), a search for the mutations was carried out, during which the c.982dup (p.Val328GlyfsTer15) mutation was discovered in the heterozygous state, a diagnosis of “Rett syndrome” was made.

Since there is no specific treatment for it, the child is recommended symptomatic: with the use of drugs, improving cerebral circulation (fenibut 0.125 g 3 times a day for 4 weeks, Pantogam 0.25 g 3 times a day for 3 months); rehabilitation: with courses of massage, physiotherapy, a developed complex of physical therapy, speech therapy treatment. An integral part of rehabilitation is the use of psychosocial, psychoeducational programs for the patient and all members of his family.

Figure 1
10-year-old girl with Rett syndrome

Discussion

RS is one of the most common reasons mental retardation in girls. RS was first described as a clinical entity in the German literature in 1966. The incidence is 1 in 15,000 to 20,000 females. It is considered to be the second most common cause, after Down's syndrome, of severe mental retardation in females. According to modern concepts, mutations in the gene lead to the disease MESR2 (Bricker & Vaughn, 2024; Gold et al., 2024). Mutations in this gene are responsible for 90–95% of cases of development of classical RS and 40–60% of cases of atypical forms of RS. The association of RS with mutations in the methyl-CpG binding protein 2 gene (MECP2) was recognised in 1999 (Sajan et al., 2017; Townend et al., 2018). MECP2 protein binds interacts with specific target genes rapidly developing brain and regulates their expression, thus influencing the development of nervous tissue. If the gene is normal, it protein at a certain point in brain development turns off several other genes, and then the child's brain develops normally. If the gene is damaged by mutation, timely switching off does not occur, and the brain begins to develop incorrectly, leading to the development of RS. This gene is located on the X chromosome, therefore, a female fetus with RS is usually able to survive to birth. In men, a defective X chromosome most often leads to intrauterine fetal death, and boys with RS have a mutation in another gene, FOXG1.

RS is characterized by profound cognitive impairment, problems with communication, stereotypic hand movements, and pervasive growth failure that follow a normal period of development during the first six to 18 months of life (Hirano & Taniguchi, 2019).

Clinical features of RS are classified into four stages. First stage is the stagnation period with onset between six and 18 months of age. It lasts for weeks to months and is characterized by developmental delay without regression. Second stage starts between one and four years of age and is characterized by regression of motor and language milestones. Third stage or pseudostationary stage may last for several decades and is seen in girls with preserved ambulation. Communication may even improve but the motor functions worsen. Forth stage is characterized by loss of ambulation. The transition from one stage to the next does not occur abruptly (Bobylova et al., 2025).

Seizures have been reported in 30–94% of patients with RS. In a series of 53 females with RS, 94% had a history of epilepsy, focal epilepsy being twice as common as generalized. The mean age of onset of epilepsy was significantly higher as compared to the onset of cognitive impairment (4 years versus 0.8 years). Bruxism is one of the most common manifestations in RS. The prevalence of sensorineural and conductive hearing loss was reported in 17% and 10% respectively.

RS is frequently misdiagnosed as cerebral palsy. Clinical features distinctive for RS, however, includes normal antenatal and perinatal periods, a normal period of development for the first 6–18 months of life and regression of acquired milestones (Gulati & Lumsden, 2019; Brunetti et al., 2020). RS is also misdiagnosed as autism (Gold et al., 2018). Autistic children lack social skills and prefer objects to people, whereas RS girls prefer affection and company of people. Though autistic features may be present initially in RS, they tend to decline with age.

Currently, the diagnostic criteria for RS include mandatory and additional criteria. To make a diagnosis, there must be at least three of six inclusive features: 1) partial or complete loss of fine motor skills by late infancy or early childhood; 2) loss of previously appeared babble, words or phrases; 3) characteristic stereotypical hand movements (most often two-handed movements in front of you, for example washing, patting, hand to mouth, etc.); 4) early-onset communication impairment (avoidance of contact, autostimulation and other autistic manifestations); 5) slowdown growth of head circumference; 6) special current illness: a period of generally normal development is replaced by a period of regression, followed by restoration of contact and communication.

At least six additional features must be present of eleven: episodes of hyperventilation and holding your breath; aerophagia; bruxism; gait dyspraxia; back deformity; deformation of the legs; hypoplastic bluish cold feet; characteristic of changes in electroencephalography (EEG) – slow background rhythm and periodic slowing of the rhythm to 3–5 Hz, centrotemporal spikes have been described as in fragile X chromosome and rolandic epilepsy); inappropriate laughter and shrill screams; impaired pain sensitivity; intensive communication using gaze (Freilinger & Marschik, 2016).

Table 1
The list of differential diagnosis with Rett syndrome

Stage I	Stage II	Stage III	Stage IV
Developmental arrest (typically in children 6–18 months of age)	Rapid deterioration or regression (typically in children 1–4 years of age)	Pseudostationary (typically in children 2–10 years of age)	Late motor deterioration (typically in patients > 10 years)
Benign congenital hypotonia Cerebral palsy Prader–Willi syndrome Metabolic disorders (e.g., fetal alcohol syndrome, trisomy 13)	Autism Angelman syndrome Encephalitis Hearing and/or visual disturbance Landau–Kleffner syndrome Psychoses Slow virus Panencephalopathy Tuberous sclerosis Metabolic disorders (e.g., phenylketonuria, ornithine transcarbamylase deficiency) Infantile neuronal ceroid lipofuscinosis	Spastic ataxia Cerebral palsy Spinocerebellar degeneration Leukodystrophies Neuroaxonal dystrophy Lennox–Gastaut syndrome Angelman syndrome (likely not Kabuki because patients would have macrocephaly)	Other degenerative disorders

Neuro-imaging studies in RS have shown generalized cerebral atrophy predominantly affecting the frontal lobes. EEG abnormalities are reported in almost all cases and findings vary with the age of the patient and the clinical stages of RS (Portnova et al., 2022; Neklyudova et al., 2024). Management is symptomatic and supportive. Long term management involves physical and occupational therapy, speech therapy, nutritional support, seizure control and orthopedic intervention. Patients need scoliosis surveillance and surgery is recommended when the curve passes 40 degrees, which is associated with good outcome. Feeding problems may benefit with changing the food texture and may require alternate routes of feeding in some cases (Saby et al., 2021). The prognosis of RS is unfavorable, since in such patients motor and neurological disorders progress, the disease leads to severe mental retardation. Patients with this pathology, with appropriate care may have a lifespan up to 40–50 years, but the risk of sudden death they are quite high. The prognosis is worsened by the

presence of malformations of internal organs, in this case, the cause of death can be have respiratory or multiple organ failure, there is a high risk of stroke (Bobylova et al., 2025).

Conclusion

RS is a complex and unique neurodevelopmental disorder primarily caused by mutations in the MECP2 gene. Its clinical manifestations, including cognitive and motor impairments, communication difficulties, sleep disturbance, present remarkable challenges to affected individuals and their families. Of RS medical orientation basically it is symptomatic and supportive and ensures full recovery it is known that there is no. Guidance should aim to maximize each patient's skills and facilitate the full range of skills they can perform, and should target. Definitive diagnosis of developing seizures and it is important to determine the appropriate treatment. Having chronic-progressive disease negatively impacting a child's family's quality of life may affect parents' psychological problems based on the fact that it can survive, possible will be provided to the family of this case for any problems help may increase coping ability and treatment.

Ethics Statement

This case report was conducted in accordance with applicable ethical standards. Written informed consent was obtained from the patient's parent/legal guardian for the publication of the clinical information and the accompanying image. Patient anonymity and confidentiality were ensured, and no personally identifiable information is included in this report.

Declaration of Competing Interests

The authors declare that they have no competing interests. M.K. is an Assistant Editor of the journal and was not involved in the editorial evaluation or publication decision concerning this manuscript.

References

Bricker, K., & Vaughn, B. V. (2024). Rett syndrome: A review of clinical manifestations and therapeutic approaches. *Frontiers in Sleep,* 3. https://doi.org/10.3389/frsle.2024.1373489

Bobylova, M. Y., Okuneva, I. V., & Ulyakov, A. N. (2025). Rett syndrome: Differential diagnosis of epileptic and non-epileptic conditions. Review of foreign literature. *Russian Journal of Child Neurology, 20*(3), 25–35. https://doi.org/10.17650/2073-8803-2025-20-3-25-35

Brunetti, S., & Lumsden, D. E. (2020). Rett syndrome as a movement and motor disorder – a narrative review. *European Journal of Paediatric Neurology, 28*, 29–37. https://doi.org/10.1016/j.ejpn.2020.06.020

Freilinger, M., & Marschik, P. B. (2016). 50 years of Rett syndrome, 1966–2016: From parents to clinicians to scientists, and for parents, clinicians, and scientists. *Wiener Medizinische Wochenschrift, 166*(11–12), 321–321. https://doi.org/10.1007/s10354-016-0490-x

Gold, W. A., Krishnarajy, R., Ellaway, C., & Christodoulou, J. (2018). Rett syndrome: A genetic update and clinical review focusing on comorbidities. *ACS Chemical Neuroscience, 9*(2), 167–176. https://doi.org/10.1021/acschemneuro.7b00346

Gold, W. A., Percy, A. K., Neul, J. L., Cobb, S. R., Pozzo-Miller, L., Issar, J. K., Ben-Zeev, B., Vignoli, A., & Kaufmann, W. E. (2024). Rett syndrome. *Nature Reviews Disease Primers, 10*, 84. https://doi.org/10.1038/s41572-024-00568-0

Gulati, P., Jain, P., Borlot, F., et al. (2019). Teaching video neuroimages: Needle-like central spikes evoked by hand tapping in Rett syndrome. *Neurology, 93*(4), e422–e423. https://doi.org/10.1212/WNL.0000000000007843

Hirano, D., & Taniguchi, T. (2019). Variation factors of stereotypical hand movements in subjects with Rett syndrome. *Developmental Neurorehabilitation, 22*(6), 376–379. https://doi.org/10.1080/17518423.2018.1523245

Neklyudova, A., Kuramagomedova, R., Voinova, A., & Sysoeva, O. (2024). Atypical brain responses to 40-Hz click trains in girls with Rett syndrome: Auditory steady-state response and sustained wave. *Psychiatry and Clinical Neurosciences, 78*(5), 282–290. https://doi.org/10.1111/pcn.13638

Portnova, G., Neklyudova, A., Voinova, V., & Sysoeva, O. (2022). Clinical EEG of Rett syndrome: Group analysis supplemented with longitudinal case report. *Journal of Personalized Medicine, 12*(12), 1973. https://doi.org/10.3390/jpm12121973

Sajan, S. A., Jhangiani, S. N., Muzny, D. M., Gibbs, R. A., Lupski, J. R., Glaze, D. G., Kaufmann, W. E., Skinner, S. A., Annese, F., Friez, M. J., Lane, J., Percy, A. K., & Neul, J. L. (2017). Enrichment of mutations in chromatin regulators in people with Rett syndrome lacking mutations in MECP2. *Genetics in Medicine, 19*(1), 13–19. https://doi.org/10.1038/gim.2016.42

Saby, J. N., Benke, T. A., Peters, S. U., et al. (2021). Multisite study of evoked potentials in Rett syndrome. *Annals of Neurology, 89*(4), 790–802. https://doi.org/10.1002/ana.26029

Townend, G. S., Ehrhart, F., van Kranen, H. J., Wilkinson, M., Jacobsen, A., Roos, M., Willighagen, E. L., van Enckevort, D., Evelo, C. T., & Curfs, L. M. G. (2018). MECP2 variation in Rett syndrome—An overview of current coverage of genetic and phenotype data within existing databases. *Human Mutation, 39*(7), 914–924. https://doi.org/10.1002/humu.23542