

SHORT REPORT

**Spinocerebellar ataxia with a novel chromosomal defect: del 5q34 –  
A case report**

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Spinocerebellar ataxias (SCA) are inherited through autosomal dominant, autosomal recessive, and X-linked patterns, and may be seen sporadically (1-4). Cerebellar findings are the main clinical characteristics of SCA. Pyramidal findings, polyneuropathy and involvement of dorsal columns and other neuroanatomic structures may also be seen (1-4).

**Case**

A 19-year-old male was admitted to our department with a 3-year history of gait disturbances. He was one of 4 children from a nonconsanguineous marriage. He stated that his cousin had been followed up with the same diagnosis by our clinic (Figure 1). Physical examination revealed pes planus and left-curved scoliosis (Figures 2,3). Neurological examination showed titubation in the

head, and nystagmus with rapid phase in the direction of the gaze. Fundoscopic examinations were normal. In addition, there were dysarthric speech, bilateral dysmetria and dysdiadochokinesis in the upper and lower limbs, an ataxic gait (he could walk only with support), moderately and severely reduced vibration sense in the upper and lower limbs, respectively, and loss of position sense in the lower extremities. The romberg sign was positive. Stocking-like hypoesthetic was detected. Deep tendon reflexes (DTRs) were absent in all extremities. The Babinski sign was bilaterally indifferent. Motor power in all extremities was normal.

In laboratory examinations, complete blood count, blood biochemistry, oral glucose tolerance, hormonal screening, lactic and pyruvic acid, vitamin B12 and folic acid levels were normal. Electrocardiography and echocardiography were not significant. Abdominal and

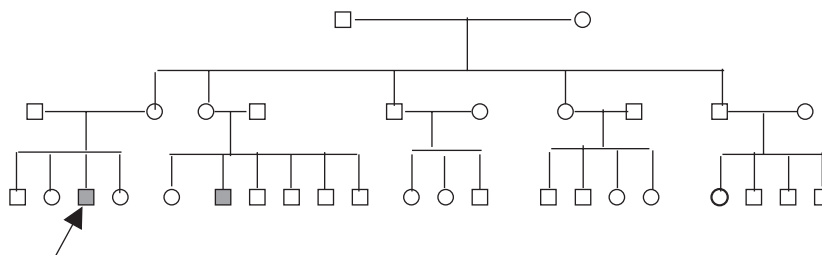


Figure 1. Pedigree of family.



Figure 2. Pes planus.



Figure 3. Left-curved scoliosis.

pelvic ultrasonography were normal. Electroneuromyographic studies displayed a significant decrease in sensory action potentials in the bilateral median and ulnar nerves and an absence of sensory action potentials in the bilateral sural nerves. Motor conduction velocities were normal, however; these findings were compatible with sensory neuropathy. Somatosensory evoked potential (SSEPs) recordings showed a response with normal latency and amplitude by median nerve stimulation and abnormal response with late latency and small amplitude by posterior tibial nerve stimulation. These findings showed a severe partial block in the lemniscal system. Brain auditory evoked potentials (BAEP) were normal. There was cerebellar atrophy in cerebral magnetic resonance imaging (MRI) (Figure 4). Cervical and thoracic spinal MRIs were normal. GAA trinucleotide repeats were studied and these too were normal (repeats number: 8-16). In chromosomal studies, phytohemagglutinin (PHA) stimulated-lymphocyte cultures were used. Karyotype was examined by the standard G-banding method. Analyzed 20 metaphases and karyotype were 46,XY,del(5)(q34) (Figures 5,6). Chromosomal studies of other siblings and parents were normal.

### Discussion

SCA are a very heterogeneous group of disorders regarding clinical and genetical characteristics. SCA are passed on by autosomal dominant, autosomal recessive and X-linked patterns. They may also occur sporadically (1-4). The clinical symptoms and signs encompass mainly cerebellar dysfunctions and associated findings due to the involvement of other neuroanatomical structures.

Our case had severe cerebellar dysfunction. Additionally, there were findings caused by the involvement of the lemniscal, pyramidal, and peripheral nervous systems. These signs were confirmed by physical and neurological examinations and electrophysiological studies. Even though the patient's cousin had been diagnosed as having SCA by our clinic, he could have not been examined cytogenetically. Considering that both our case and his cousin had the same type of SCA by history, supplemented with the pedigree, we propose that the inheritance pattern in this family may be autosomal dominant.

We detected 5q34 deletion. In deletion of the long arm of chromosome 5q is seen multiple congenital

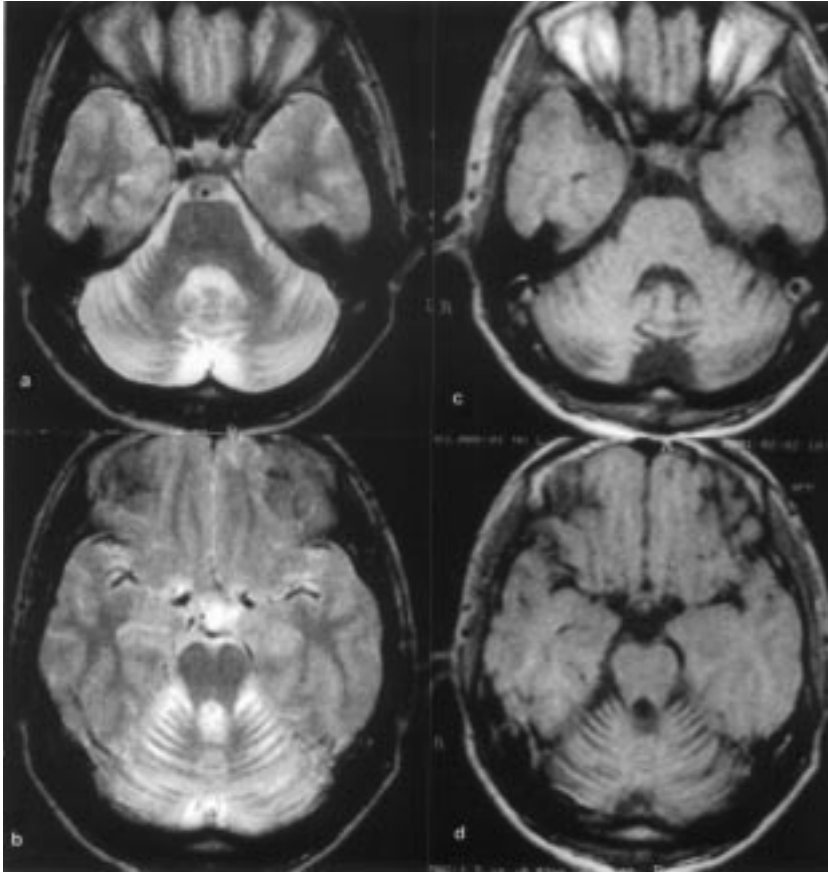


Figure 4. Cerebellar atrophy in cerebral magnetic resonance imaging (a,b: T2 weighted and c,d: T1 weighted MR imaging).

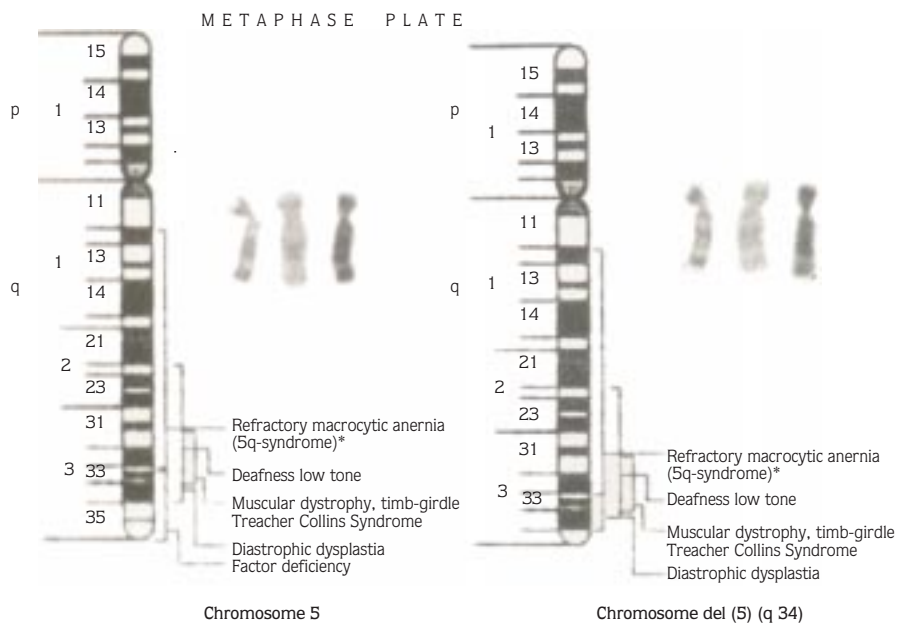
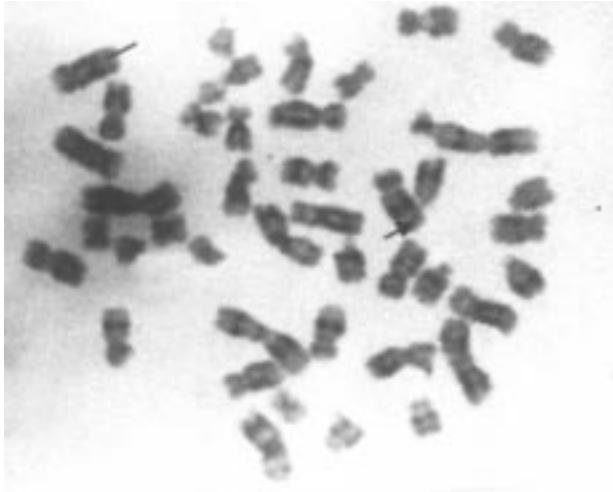


Figure 5. 46,XY,del(5)(q34).



Karyotype 46,XY, del (5) (q 34)

Figure 6. — Normal → Patient.

anomaly syndrome (such as malformations of the CNS, defects of cardiac septation etc) consisting of a combination of oral, facial and digital anomalies and developmental delay (5,6). However, these features were absent in our patient. This deletion has not been reported in SCA patients in the literature until now, whereas

deletions in different regions of 5q have been shown in some patients with other disorders such as myelodysplastic syndromes and spinal muscular atrophy (7-9). In addition to the deletions, fragility of 5q34 was shown in type I bipolar disorder, while mutation of chromosome 5q31 was shown in schizophrenia in German and Israeli families (10,11). Moreover, in SCA type 12, passed through autosomal dominant inheritance, patients have been linked to the locus in chromosome 5q31-q33 (12). The clinical picture of our case was distinct from these diseases in every respect. Although we could not have investigated all the genetic abnormalities involved in SCA, we think that the finding of a new chromosomal defect, unrelated to any diseases, in our case is important and that there may be a correlation between a new SCA type and this deletion.

In short, del 5q34, found in our case, is to our knowledge a novel chromosomal defect. We think that this may contribute to the SCA literature.

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## References

1. Harding AE. Cerebellar and spinocerebellar disorders. Bradley WG, Droff RB, Fenictel GM, Marsden CD (eds). Neurology in Clinical Practice. Boston Butterworth-Heinemann 1991, pp: 1603-1623.
2. Pujana MA, Corral J, Gratacos M et al. Spinocerebellar ataxias in Spanish patients: genetic analysis of familial and sporadic cases. The Ataxia Study Group. Hum Genet 104: 516-22, 1999.
3. Bertini E, des Portes V, Zanni G et al. X-linked congenital ataxia: a clinical and genetic study. Am J Med Genet 92: 53-6, 2000.
4. Morton NE, Lalouel JM, Jackson JF et al. Linkage studies in spinocerebellar ataxia (SCA). Am J Med Genet. 6: 251-7, 1980.
5. Kleczkowska A, Fryns JP, van den Berghe H. A distinct multiple congenital anomalies syndrome associated with distal 5q deletion (q35.1qter). Ann Genet. 36: 126-8, 1993.
6. Schafer IA, Robin NH, Posch JJ et al. Distal 5q deletion syndrome: phenotypic correlations. Am J Med Genet. 103: 63-8, 2001
7. Goldberg H, Lusk E, Moore J et al. Survey of exposure to genotoxic agents in primary myelodysplastic syndrome: correlation with chromosome patterns and data on patients without hematological disease. Cancer Res 50: 6876-81, 1990.
8. Nowell PC, Besa EC, Stelmach T et al. Chromosome studies in preleukemic states. V. Prognostic significance of single versus multiple abnormalities. Cancer 58: 2571-5, 1986.
9. Rochette CF, Surh LC, Ray PN et al. Molecular diagnosis of non-deletion SMA patients using quantitative PCR of SMN exon 7. Neurogenetics 1: 141-7, 1997.
10. Schwab SG, Eckstein GN, Hallmayer J et al. Evidence suggestive of a locus on chromosome 5q31 contributing to the susceptibility to schizophrenia in German and Israeli families by multipoint affected sib-pair linkage analysis. Nature Genet 11: 325-327, 1996.
11. Turecki G, Smith M, Mari JJ. Type I bipolar disorder associated with a fragile site on chromosome 1. Am J Med Genet 60:179-182,1995.
12. Schols L, Amoiridis G, Buttner T et al. Autosomal dominant cerebellar ataxia: phenotypic differences in genetically defined subtypes? Ann. Neurol. 42: 924-932, 1997.