Case Report

Partial 6p Trisomy with Abnormal ABR and Hypogenesis of the Corpus Callosum

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About 20 cases of partial 6p trisomy have been reported since Therkelsen et al. published four cases of familial unbalanced C/F translocation in 1971.

Partial 6p trisomy is characterized by a low birth weight, psychomotor retardation and dysmorphic craniofacial features. We report mainly the neurologic findings, including MRI and ABR results of a 4-month-old male infant with 6p trisomy.

CASE REPORT

The patient was the parent’s second child. An elder brother aged 4 years was healthy. The mother and father were consanguineous. The father’s maternal grandmother was a cousin of the mother’s maternal grandmother. The father and mother were 34 and 32 years of age. Both parents were healthy. The father had one sibling with cerebral palsy, and the mother had one healthy sibling. The maternal grandmother had a history of spontaneous abortion. The patient was delivered by cesarean section at 37 weeks of gestation because of intrauterine growth retardation. At birth, he weighed 1,498 g, and was considered small for his gestational age. His length and head circumference were 40.0 cm and 28.4 cm, respectively. He required mechanical ventilation because of respiratory failure after neonatal asphyxia for 6 days, and phototherapy to jaundice for 5 days. Craniofacial features included: microcephaly, a broad forehead, a large anterior
fontanelle, blepharoptosis, blepharophimosis, sparse hair, thin eyebrows, long eyelashes, a bulbous nose, a long philtrum, a small mouth, thin lips, a high arched palate, a pointed chin, low set, malformed ears, and nevi flammeus on left eyelid and nape (Fig. 1).

He had feeding difficulties and frequent vomiting in addition to rhinorrhea, nasal obstruction, and wheezing. A fiberscope study revealed that the nasal cavity, pharynx, and larynx were anatomically normal. His weight gain was insufficient, and did not reach 20 g/day although he received 200 ml/kg/day of milk. He had protracted diarrhea from the age of 2½ to 4 months. At 4 months, his measurements were 3,584 g in weight, 54.0 cm in length, and 36.7 cm in head circumference, which were −3.7SD below the means for his age.

Neurologic findings. He began smiling at 3½ months of age. However, his head control was unsteady, and he could not hold his head up in the supine position.

Laboratory investigations. Routine biochemical investigations revealed no abnormalities except eosinophilia. Ultrasound cardiogram showed small atrial septal defect. Abdominal computed tomogram revealed no renal malformations. Electroencephalogram at 2½ months of age did not show a spindle phase, laterality, or paroxysmal activity. The auditory brain stem response (ABR) at 2½ months of age revealed a poor response except for waves I and II on the left side. However the ABR pattern was normal on the right side. Brain stem insufficiency was suspected on the basis of these results (Fig. 2). Cranial CT and MRI at 2½ months of age showed microcephaly with micrencephaly and normal myelination of the ventral pons, cerebral white matter, ventrolateral thalamus, central gyrus,
posterior crus of the internal capsule, and optic radiation. However myelination had not developed in the frontal, lateral, occipital lobes. In the corpus callosum the splenium seemed clear, however on the whole hypoplastic corpus callosum was suspected (Fig. 3).

Familial chromosomal analyses were performed on peripheral blood lymphocytes by G banding (Fig. 4). The infant's karyotype was 46,XY,21p+. The father's karyotype was normal, although the mother had a balanced translocation. Her karyotype was 46,XX,t(6;21)(p22;p13). Therefore the patient's karyotype was decided as 46,XY,−21,+der(21),t(6;21)(p22;p13) mat, and he had a
DISCUSSION

Only about 20 cases of 6p trisomy have been reported. However it has a characteristic phenotype, and it is an identified disorder (Chiyo et al. 1975; Cote et al. 1978; Bernheim et al. 1979; Pagano et al. 1980). The major features of the syndrome appear to be; low birth weight, mental and growth retardation, failure to thrive, and facial dysmorphisms. Patients often manifest large fontanels, blepharoptosis, blepharophimosis, long philtrum, bulbous nose, small mouth, and small pointed chin. This patient had all the associated features except for a high forehead and flat occiput. We consider this case as a pure 6p trisomy, because this case was associated with translocation onto chromosome 21 and had a deletion of 21p13-pter, although the part had little genetic information. Therefore many of these abnormalities presented in this case were possibly associated with partial 6p trisomy (Chiyo et al. 1975).

Central nervous system (CNS) disorders associated with 6p trisomy are hydrocephaly (Breuning et al. 1977; Eden et al. 1985; Scarbrough et al. 1986), arhinencephaly (Pearson G 1979; Smith and Pettersen 1985), agenesis of the corpus callosum (Katafuchi et al. 1992), and chronic meningitis (Therkelsen et al. 1971; Breuning et al. 1977).
To our knowledge, previous cranial MRI of patients with 6p trisomy has been reported only in one case in which complete agenesis of the corpus callosum was revealed (Katafuchi et al. 1992). In our patient cranial MRI suggested almost normal myelination for 2.5 months of age, and a possible hypoplastic corpus callosum. Moreover, none of the previous reports have mentioned the use of ABR at the baby food stage. This patient’s ABR at 2.5 months of age suggested possible brain stem dysfunction.

At least two adult cases of 6p trisomy have been reported including a 23-year-old patient (Eden et al. 1985) and a 56-year-old patient (Nelson and Smart 1982). The severity of the mental and developmental delays seems to be different from case to case. For example, one patient’s ultimate height is 170 cm (Eden et al. 1985), and he shows moderate mental retardation. Another patient’s height is only 119 cm at 17 years of age (Smith and Pettersen 1985). The features of this syndrome do not seem to depend on the chromosomal break points (Ferrando et al. 1981; Scarbrough et al. 1986; Burd et al. 1988). It is also unlikely that the CNS disorders alone determine the severity of the mental and developmental delays. Though cranial MRI or ABR are effective in diagnosing CNS abnormalities in 6p trisomy patients, more cases should be studied and reported.

References

