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A CASE OF TERMINAL LONG ARM DELETION OF CHROMOSOME 6

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ABSTRACT

A four-year-old girl with deletion of chromosomal band 6q24 → qter is described. Clinical features include growth and psychomotor retardation, microcephaly, convergent strabismus, bulbous nose, long philtrum, short neck and cardiopathy.

INTRODUCTION

At least ten cases of distal deletions of the long arm of chromosome 6 have been described to date (see Stevens *et al.*, 1988). The present report describes an infant with a distal deletion of the long arm of chromosome 6 (q24 → qter), with MCA/MR syndrome.

CASE REPORT

The proband (Figure 1) is the only child of healthy, unrelated parents (mother 26, father 27 years old). The family history revealed difficulty in conceiving. The father had mumps with testes involvement during adolescence and he is now oligospermic. During midpregnancy the mother suffered from vomiting and required serum transfusions. Delivery was by Ceasarean section at term. Birthweight was 2970 g, the infant required oxygen therapy and was kept in the hospital's neonatal care unit for two weeks.

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Growth and psychomotor development were severely retarded. Physical examination at four years showed a thin, short girl, 85 cm in length, 9170 g in weight and a head circumference of 44.5 cm, all below the 3rd percentile. She was just begining to sit and could not walk or speak. Dysmorphic features included flat occiput, triangular facies, low-set malformed ears, pre-auricle hairs, convergent strabismus, small and downslanting palpebral fissures, epicanthal folds, bulbous nose, long and poorly

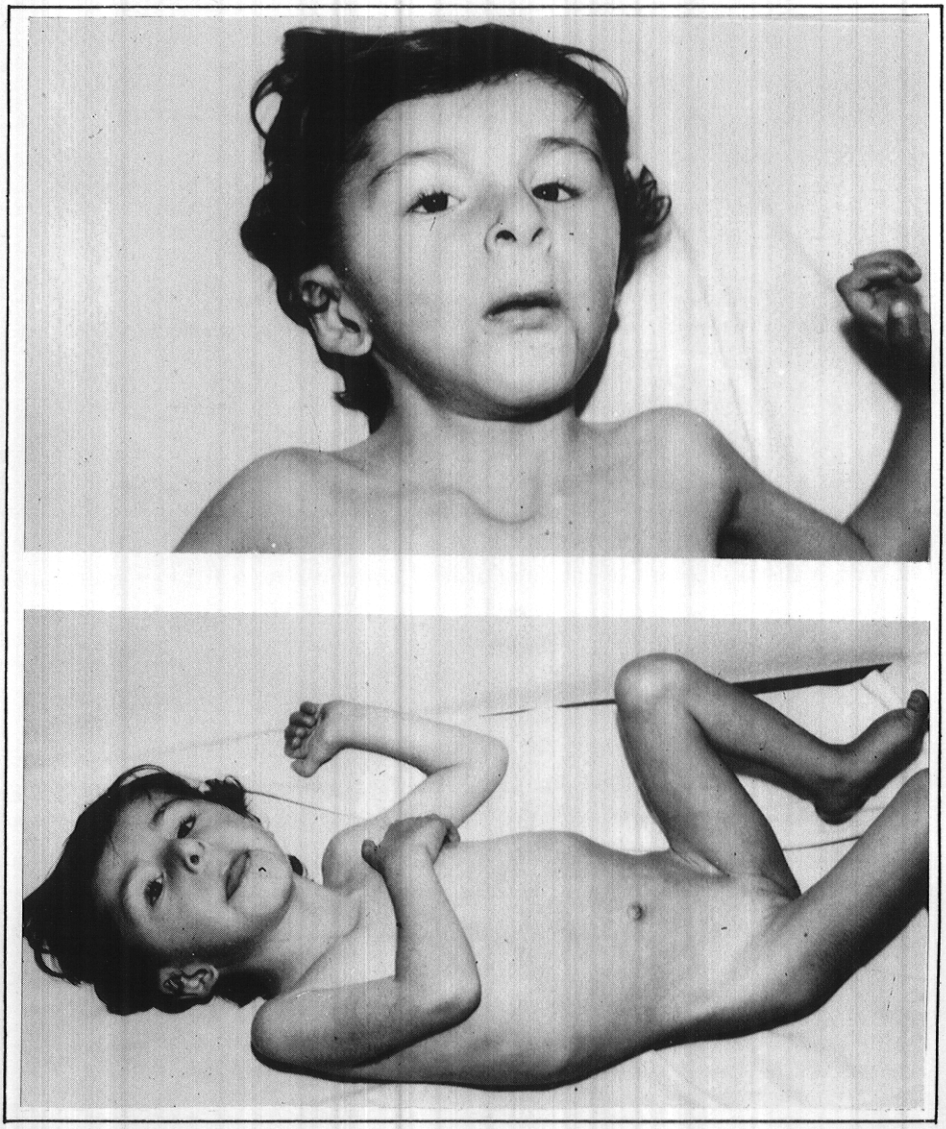

Figure 1 - The proposita, aged four years.

marked philtrum and high-arched palate. Her neck was short and webbed, the chest was narrow with widely-spaced hypoplastic nipples. There was discrete hypoplasia of the vulvar labia minora, mild dystrophy of the 5th fingernail of the left hand and club feet.

X-rays showed no cerebral calcifications, normal sella turcca, moderate craniostenosis of the coronal suture, chest deformities and enlargement of the cardiac region, especially the left ventricle. A systolic murmur was recognizable, but the echocardiogram was normal.

The patient developed a seizure disorder controlled by phenobarbital and clonazepam at eight months of age. EEG was abnormal, poorly organized, asymetric and without epileptic discharge.

CYTOGENETIC STUDIES

Chromosome studies were carried out on peripheral blood lymphocytes. The proband's karyotype was interpreted as 46,XX,del(6) (q24 → qter) based on analysis of GTG banded metaphases (Figure 2). Both parents had normal chromosomes.

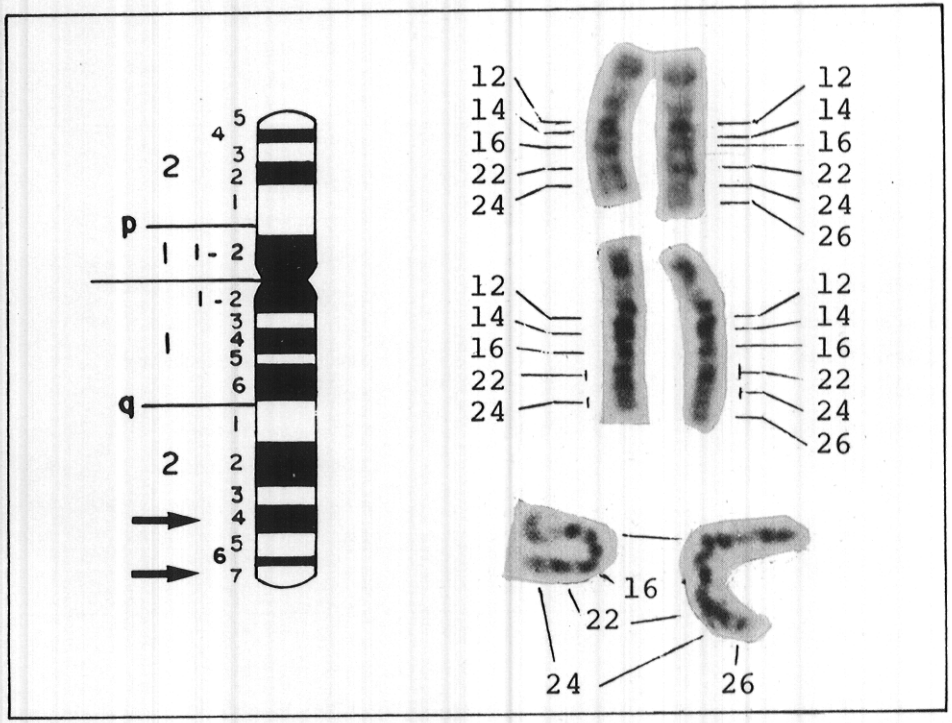

Figure 2 - G-banding of the normal (right) and deleted (left) chromosome 6. In the diagram of the normal chromosome 6, the arrows point to the probable breakpoints.

DISCUSSION

Eleven patients with distal deletions of the long arm of chromosome 6 have now been described. These cases include four with a del (6) (q23 or 24 → qter) (Kueppers *et al.*, 1977; Goldberg *et al.*, 1980; Fryns *et al.*, 1986; present study); six with a del (6) (q25 → qter) (Milosevic and Kalicanin, 1975; Bartoshesky *et al.*, 1978; Liberfarb *et al.*, 1978; Rivas *et al.*, 1986; Stevens *et al.*, 1988); and one with a del (6) (q26 → qter) (Hagemeijer *et al.*, 1977).

Table I summarizes the clinical signs present in the eleven patients lacking the segments 6q23 or 24 → qter, 6q25 → qter or 6q26 → qter. While many similarities do exist among affected individuals, the clinical abnormalities are really not striking and are in fact associated with many other chromosomal aberrations.

Table I - Clinical signs in patients with 6q deletions*.

References:
Milosevic and Kalicanin, 1975
Hagemeijer *et al.*, 1977
Kueppers *et al.*, 1977
Bartoshesky *et al.*, 1978
Liberfarb *et al.*, 1978
Goldberg *et al.*, 1980
Fryns *et al.*, 1986
Rivas *et al.*, 1986
Stevens *et al.*, 1988
Present study

Sex	5M/6F	Micrognathia	6/9
Mental retardation/developmental delay	11/11	Cleft palate	2/10
Growth retardation	8/10	Long philtrum	6/7
Hypotonia	6/8	Short neck	6/8
Microcephaly	10/11	Congenital heart disease	6/10
Macular degeneration	2/4	Hernias	3/8
Epicanthal folds	6/8	Smallpenis/cryptorchidism	4/5
Strabismus	6/7	Scoliosis	2/5
Broad nasal bridge	6/8	Clinodactyly 5th finger	2/6
Prominent nose	5/9	Abnormal flexion creases	4/7
Large ears	5/9	Finger nail and hand anomalies	6/11
Low set ears	5/9	Leg and foot abnormalities	7/10
Malformed ears	6/9		

* Cases in which the feature is present/informative cases.

The variation in the breakpoint locations (6q23, 6q25, 6q26) makes the comparison among the patients difficult; the deletion 6q26 → qter representing a smaller loss of genetic material than the deletion of 6q23 → qter. The small number of patients

described with distal 6q deletion is also a complicating factor. But even taking into account these aspects, it is possible to pinpoint some clinical signs shared by these patients, including mental and growth retardation, hypotonia, microcephalia, epicanthal folds, strabismus, broad nasal bridge, long philtrum, short neck, and leg and foot abnormalities. It is possible that a more precise karyotype-phenotype delineation will emerge as additional cases are reported.

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RESUMO

Descreve-se uma menina de quatro anos com deficiência do segmento cromossômico 6q24 → qter. Os achados clínicos incluem retardo psicomotor e de desenvolvimento, microcefalia, estrabismo convergente, nariz proeminente, filtro longo, pescoço curto e cardiopatia.

REFERENCES

Bartoshesky, L., Lewis, M.B. and Pashayan, H.M. (1978). Developmental abnormalities associated with long arm deletion of chromosome 6. *Clin. Genet. 13*: 68-71.

Fryns, J.-P., Bettens, W. and Van den Berghe, H. (1986). Distal deletion of the long arm of chromosome 6: A specific phenotype? *Am. J. Med. Genet. 24*: 175-178.

Goldberg, R., Fish, B., Ship, A. and Shprintzen, R.J. (1980). Deletion of a portion of the long arm of chromosome 6. *Am. J. Med. Genet. 5*: 73-80.

Hagemeijer, A., Hoovers, J., Smit, E.M.E. and Bootsma, D. (1977). Replication pattern of the X chromosomes in three X/autosomal translocations. *Cytogenet. Cell Genet. 18*: 333-348.

Kueppers, F., Dewald, G., Gordon, H. and Pineda, A. (1977). Exclusion of the HLA locus from a large portion of the long arm of chromosome 6. *Hum. Hered. 27*: 242-246.

Liberfarb, R.M., Atkins, L. and Holmes, L.B. (1978). Chromosome 6q and associated malformations. *Ann. Génét. 21*: 223-225.

Milosevic, J. and Kalicanin, P. (1975). Long arm deletion of chromosome No. 6 in a mentally retarded boy with multiple physical malformations. *J. Ment. Defic. Res. 19*: 139-144.

Rivas, F., Ruiz, C., Rivera, H., Möller, M., Serrano-Lucas, J.I. and Cantú, J.M. (1986). *De novo* del (6) (q25) associated with macular degeneration. *Ann. Génét. 29*: 42-44.

Stevens, C.A., Fineman, R.M., Breg, W.R. and Silken, A.B. (1988). Report of two cases of distal deletion of the long arm of chromosome 6. *Am. J. Med. Genet. 29*: 807-814.

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