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A CASE OF CHROMOSOME 3 DUPLICATION q DELETION p SYNDROME BORN TO THE MOTHER WITH A PERICENTRIC INVERSION, inv(3)(p25q21)

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Summary An 18-day-old girl with a rec(3), dup(q21→qter), del(p25→pter) karyotype is presented. She was the first product of the mother who had a pericentric inversion, inv(3) (p25q21). The clinical features of this patient are compared with those of 6 previously reported cases.

INTRODUCTION

In 1974, Boué *et al.* described the first case of chromosome 3 duplication q deletion p syndrome. Thereafter, Allderdice *et al.* (1975) and Fineman *et al.* (1978) reported patients with similar chromosomal abnormalities. We report here the first case in Japan of chromosome 3 duplication q deletion p syndrome and compare the karyotype and clinical features of this patient to those of the 6 reported cases.

CASE REPORT

A Japanese girl was referred to the University hospital at 18 days of life with cyanosis and heart murmur. She was a 1,980 g product of a 37 week uncomplicated pregnancy. She was the first child of healthy nonconsanguineous parents. The maternal age was 23 years and paternal age 26 at the time of the child's birth. The mother had not experienced miscarriage. There was no family history of congenital malformation and mental retardation.

On admission her body weight was 2,110 g and physical examination revealed a hypotonic and cyanotic infant. The face was square and showed hypertrichosis and frontal bossing. The palpebral fissere was upward-slanting and there were hypertelorism, epicanthal folds and long eyelashes. The nose was short and upturned. Both ears were low-set and malformed with overhang of anti-helix. There were micrognathia, protruding maxilla, high arched palate and short neck (Fig. 1). A 3/6 systolic murmur was heard at the left 3rd intercostal space. There was a soft and tube-like tumor in the left lower abdomen. The patient had short extre-

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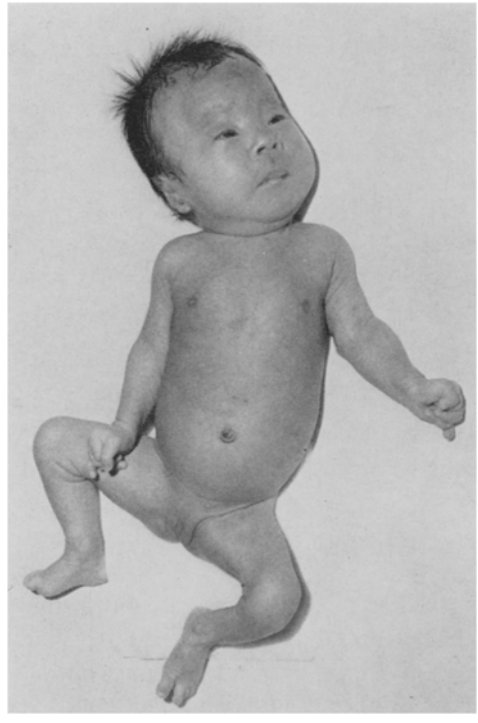

Fig.1. Patient at 18-day-old. Note hypertrichosis, frontal bossing, upward-slanting palpebral fissure, hypertelorism, epicanthal folds, short and upturned nose, low-set and malformed ears, micrognathia, protruding maxilla, short neck, short extremities, camptodactyly and overlapping fingers.

mities, clinodactyly of the fifth fingers, simian creases, camptodactyly and overlapping fingers.

Cardiac evaluation revealed the presence of ventricular septal defect. Intravenous pyelogram and barium enema showed no remarkable findings. Routine laboratory data were within normal ranges.

At age of 61 days the patient died of heart failure. Autopsy revealed atrial septal defect, ventricular septal defect, partial polycystic kidney, eleven ribs and three lobes in the left lung. The soft and tube-like abdominal mass was left double ureters with hydropic change.

CYTOGENETICS

G-band analysis of chromosome on cultured peripheral blood lymphocytes from the patient revealed a terminal deletion of the short arm and a terminal duplication of the long arm of a chromosome 3. The other chromosomes were nor-

mal. The karyotype was interpreted as 46,XX,rec(3), dup(q21→qter), del(p25→pter). The mother's karyotype, as analyzed by the same method, was 46,XX,inv(3)(p25q21) (Fig. 2). The father and maternal grandparents showed normal karyotypes.

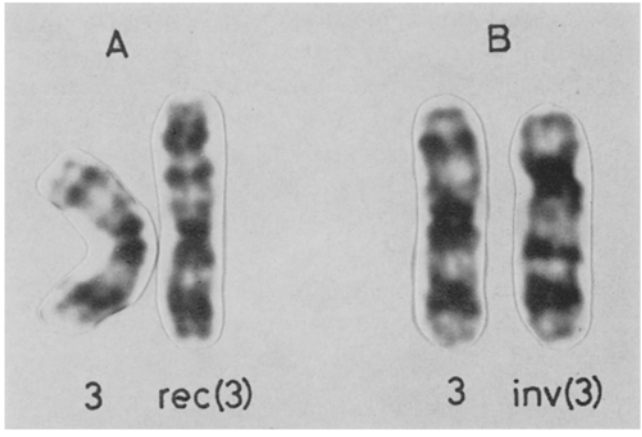

Fig. 2. Normal and abnormal No. 3 chromosomes in the patient (A) and her mother (B).

Table 1. Phenotypical features of two categories of chromosome 3 duplication q deletion p syndrome.

	dup(q25→qter) type*	dup(q21→qter) type	
		5 reported cases**	Present case
Growth retardation	+	4***	+
Mental retardation	+	3	?
Hypotonia	+	3	+
Persistent lanugo	−	3	+
Distorted head	+	4	+
Hypertelorism	−	4	+
Congenital glaucoma	−	2	?
Short and upturned nose	+	4	+
Low-set and malformed ears	+	5	+
High arched palate	+	1	+
Protruding maxilla	−	1	+
Micrognathia and/or retrognathia	−	4	+
Short or webbed neck	−	4	+
Congenital heart disease	−	2	+
Urogenital anomalies	−	2	+
Skeletal anomalies	+	4	+
Short extremities	+	2	+

* A case from Fineman *et al.* (1978). ** A case from Boué *et al.* (1974), 3 cases from Allderdice *et al.* (1975) and 1 case from Fineman *et al.* (1978). *** Number of cases with indicated abnormality.

COMMENT

Five of the 6 reported cases and the present case had the same karyotype, rec(3), dup(q21→qter), del(p25→pter), which was accounted for a pericentric inversion, inv(3)(p25q21) of either the mother (4 cases) or the father (2 cases). The remaining one case which had a karyotype of rec(3), dup(q25→qter), del(p25→pter) was caused by another type of paternal inversion, inv(3)(p25q25) (Fineman *et al.*, 1978). At the present moment, this syndrome can be karyotypically classified into two categories; dup(q21→qter) and dup(q25→qter). The counter part to this anomaly, *i.e.,* the shorter recombinant, rec(3), dup p del q (Allderdice *et al.*, 1975), has never been found clinically up to now. This may imply that the deletion of such a larger part of the long arm of chromosome 3 exerts a lethal effect.

Many patients died from the multiple congenital defects during the first months of life, while those who survived beyond their early life showed severe mental and growth retardation. Main phenotypical features of the two types of chromosome 3 duplication q deletion p syndrome were compared and shown in Table 1. The present case showed most of them, which may fit the dup(q21→qter) category mentioned above.

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