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Case Report

TERMINAL DELETION OF THE SHORT ARM OF CHROMOSOME 3

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Summary A boy with growth and mental retardation, flat occiput, high and broad forehead, blepharoptosis, narrow palpebral fissures, low set, malformed ears, short neck, anal atresia, deep sacral dimple is reported. High-resolution banding analysis showed terminal deletion of the short arm of chromosome 3 (46,XY,del(3)(p25.3)). Deletions of the short arm of chromosome 3 are relatively rare. The clinical features of the patient are compared with those of 19 previously reported cases.

Key Words chromosome 3, chromosome deletion, high-resolution banding

INTRODUCTION

Deletions of the short arm of chromosome 3 are rare. Most cases involve the distal segment (3p25). Following the first description by Verjaal *et al.* (1978), detailed reportsh ave been made on 16 patients (Fineman *et al.*, 1978; Gonzales *et al.*, 1980; Merrild *et al.*, 1981; Higginbottom *et al.*, 1982; Zergollern and Hitrec 1983; Beneck *et al.*, 1984; Witt *et al.*, 1985; Tolmie *et al.*, 1986; Reifen *et al.*, 1986; Schwyzer *et al.*, 1987), and brief reports on another three patients (Smith and Sachdeva, 1980; Garcia *et al.*, 1981). We report an additional case with the same deletion of 3p and compare the clinical features with those of 19 previously reported cases.

CASE REPORT

The patient was a boy, the first born to healthy non-consanguineous parents when the mother was 19 and the father was 36 years of age. No other individuals

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with congenital anomalies were known in the family. The delivery was at 40 weeks of gestation. The birth weight was 1,950 g, length 42 cm, and head circumference 30 cm. Because of a small-for-date infant, the baby was transferred to our nursery unit. The craniofacial appearance was dysmorphic with flat occiput, high and broad forehead, blepharoptosis, narrow palpebral fissures, dysplastic and low set ears, micrognathia, and short neck (Fig. 1). Anal atresia and deep sacral dimple were noted. The fourth toes were placed on a high position. The results of routine hematological and biochemical tests were all normal. Echocardiography revealed no cardiac anomalies. Both brain CT and MRI findings were normal. The auditory brain stem evoked response was normal. Intravenous pyelography

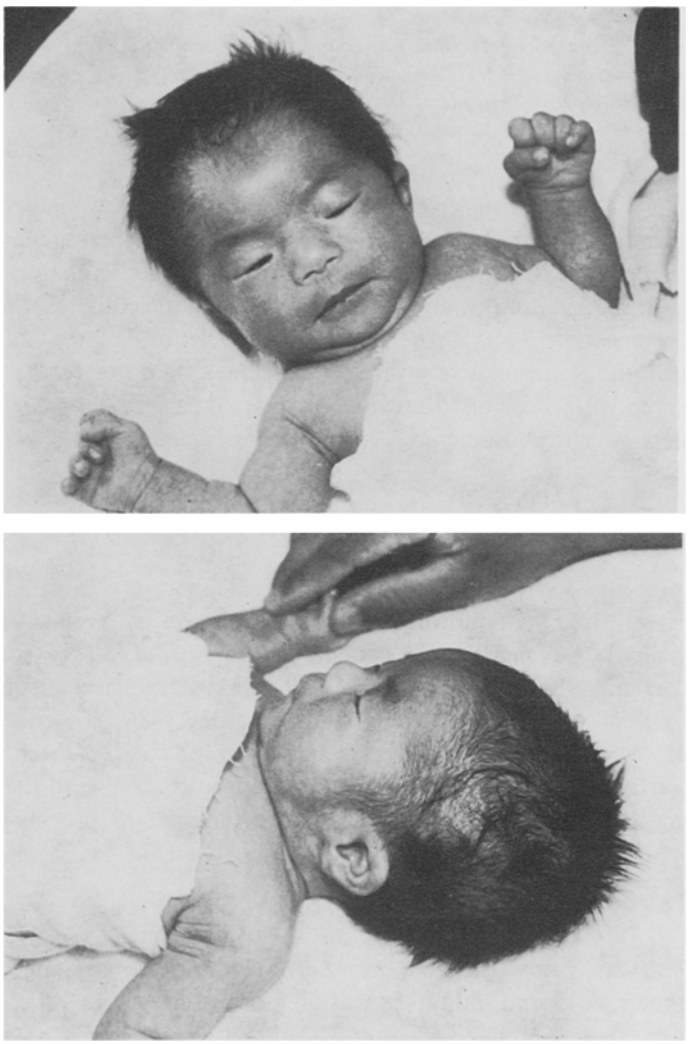

Fig. 1. Proband at age one month.

and echography of the kidneys were normal, but Grade 2 vesicoureteral reflux was noticed by cystography. Ophthalmological examinations revealed normal ocular fundi and irides. Otorhinolaryngeal examinations revealed laryngomalacia. Because his mother was an HB carrier, he was given an intramuscular injection of HBIG immediately after birth. On the first day of life, he underwent an operation for anal atresia. The bilirubin rose to a maximum of 12.8 mg/dl on the second day of life and he was treated with phototherapy for three days. On the third day of life he began self-feeding and could feed well without vomiting. From about two months of age inspiratory stridor on sucking appeared and his body weight gain became poor. At 66 days of age, he weighed 3,060 g, and was dis-

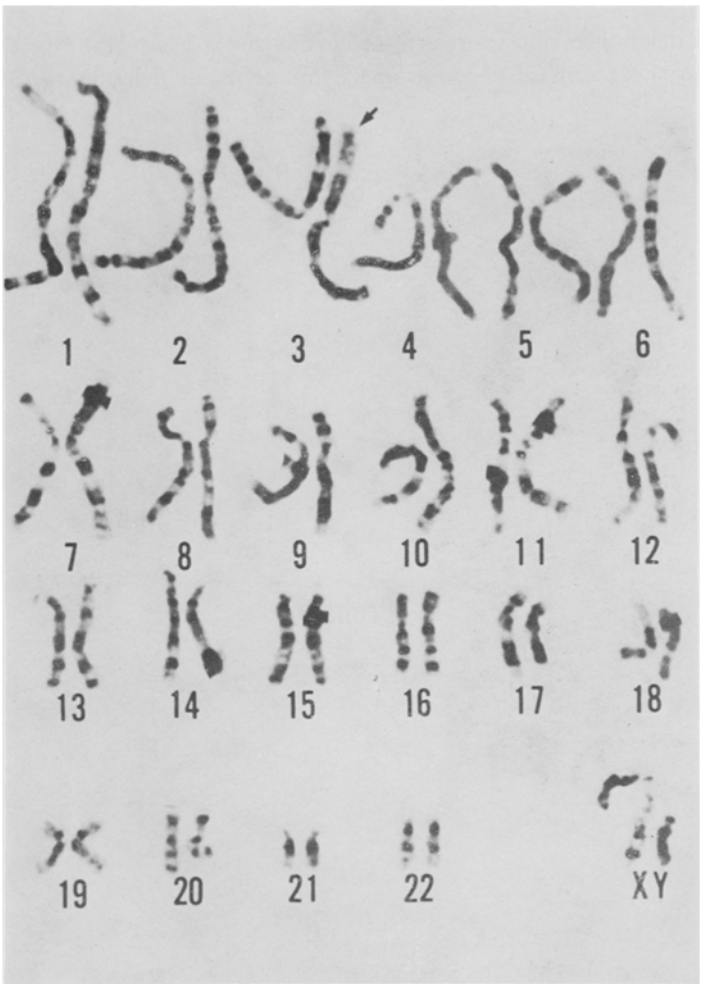

Fig. 2a. A GTG-banded karyotype of the proband showing an abnormal chromosome 3 (arrow).

charged. Later, mental and growth retardation became apparent to the parents. White blood cells showed abnormal increases during the three episodes of urinary tract infection, and an immunological disorder was suspected. At 12 months of age, he was incapable of rollingover and sitting. At that age his body weight was 4,715 g (−5 S.D.) and length 57 cm (−7.1 S.D.).

Cytogenetic studies. G-banding chromosome analysis from cultured peripheral blood lymphocytes of the patient showed a deletion of the short arm of chromosome 3. The karyotype of the patient was 46,XY,del(3)(p25.3). The parents' chromosomes were normal (Fig. 2).

DISCUSSION

Partial deletion of the short arm of chromosome 3 is rare. Most partial deletions of the short arm of chromosome 3 are terminal deletion del(3)(p25). Pre-

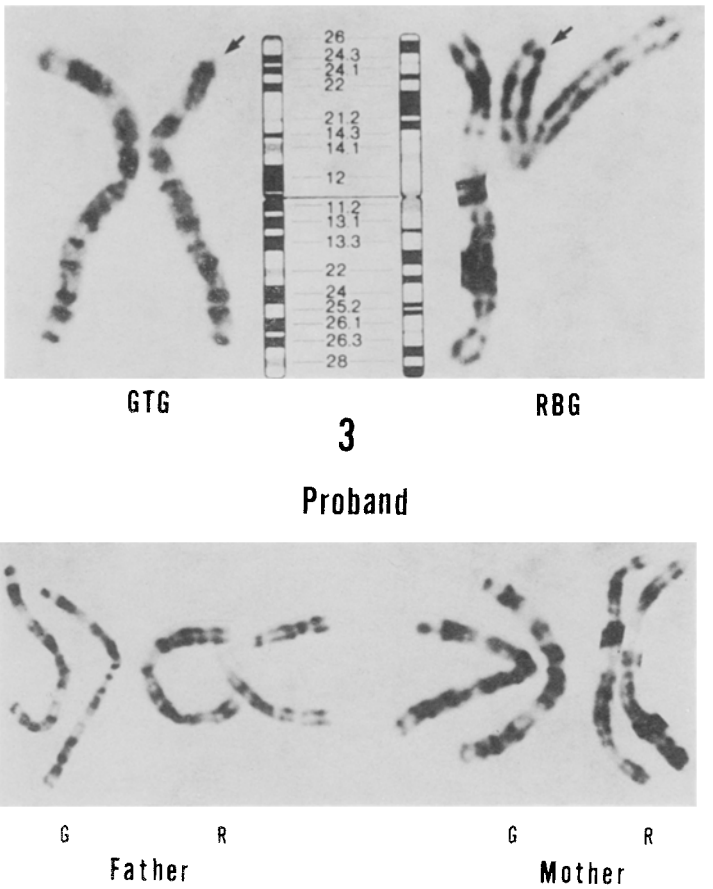

Fig. 2b. Banded chromosome 3 pair from the proband and his parents. Arrows indicate the break point.

viously Aula and Von Koskull (1976) reported that the 3p2 region is susceptible for spontaneous chromosome breakages.

The clinical findings of the reported cases with del(3)(p25.3), including our case are summarized in Table 1. The prominent features in most cases were severe mental and growth retardation, microcephaly, flat occiput, epicanthic folds, blepharoptosis, abnormal nose, low and malformed ears and postaxial polydactyly. In this chromosomal aberration, gastrointestinal anomalies are rare and anal atresia which occurred in our case was observed in only one additional case (Reifen *et al.*, 1986). Vesicoureteral reflux and laryngomalacia were not observed previously. The reported cases with terminal deletion of the short arm of chromosome 3 had similarities in phenotypic appearance, including typical facial appearance and severe mental and growth retardation. So del(3p) can be diagnosed clinically. We suggest that del(3p) is established as a syndrome. Narahara *et al.* (1990) reviewed the previously reported cases with a deletion of the distal portion of 3p(del(3p)

Table 1. Clinical findings in our patient compared to 19 cases from the literature.

	19 cases	Our patient
Low birth weight	9/19	+
Dolichocephaly	6/19	−
Microcephaly	14/19	−
Triangular face	7/19	−
Flat occiput	7/19	−
Synophrys	8/19	−
Epicanthic folds	12/19	−
Blepharoptosis	17/19	+
Hypertelorism	8/19	−
Abnormal nose	16/19	−
Long philtrum	11/19	−
Micrognathia	9/19	+
Low set ears	12/19	+
Malformed ears	13/19	+
Preauricular pits	5/19	−
Postaxial polydactyly	9/19	−
Sacral dimple	6/19	+
Muscular hypotonia	9/19	−
Growth retardation	17/17	+
Mental retardation	17/17	+
Congenital heart disease	7/19	−
Renal abnormalities	5/19	+
Abnormal EEG	7/19	−

and r(3)) and concluded that loss of the band 3p 25.3 was critical in the manifestation of del(3) syndrome.

Six ring chromosome 3 cases (Kitatani *et al.* 1984; Mckinley *et al.*, 1991) have been reported. Four cases had break points at p26 and q29 and their phenotypes were different from those of del(3) cases. We suggest that the phenotype of r(3) is often different from that of del(3p) because of the ring structure and more distal break point.

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